türkomurga

XIII.
Uluslararası Türk Omurga Kongresi

PROGRAM ve ÖZET KİTABI

3 – 6 Nisan 2019
Swissotel Grand Efes
İzmir

www.spinecongress2019.com

DÜZENLEME KURULU

KONGRE BAŞKANLARI

Dr. R. Kemal KOÇ

Dr. Ali ŞEHİRLİOĞLU

KONGRE SEKRETERLERİ

Dr. Erdal COŞKUN

Dr. Metin ÖZALAY

SAYMAN

Dr. Ömer AKÇALI

KONGRE DÜZENLEME KURULU

Dr. Ömer AKÇALI

Dr. Erdal COŞKUN

Dr. Hakan EMMEZ

Dr. Esat KITER

Dr. Metin ÖZALAY

Dr. M. Onur ULU

BİLİMSEL KURUL

EMRE ACAROĞLU
ATİLLA AKBAY
ÖMER AKÇALI
BURAK AKESEN
TURGUT AKGÜL
VİLDAN AVKAN OĞUZ
AHMET ALANAY
AKİF ALBAYRAK
EMİN ALICI
MURAT ALTAŞ
NECDET ALTUN
MAHMUT ARGÜN
ALİ ARSLANTAŞ
ÖZKAN ATEŞ
YUNUS ATICI
AYHAN ATTAR
UFUK AYDINLI
HAYATİ AYGÜN
MEHMET AYVAZ
MESUT BAKIR
BÜLENT BALİOĞLU
TEOMAN BENLİ
HALUK BERK
MURAT BEZER
KADİR BİRLER
SUAT CANBAY
ERDAL COŞKUN
ŞÜKRÜ ÇAĞLAR
M. SEDAT ÇAĞLI
SÜLEYMAN R. ÇAYLI
SUAT EROL ÇELİK
MUSTAFA ÇELİKTAŞ
ENGİN ÇETİN
NURİ ERALP ÇETİNALP
MERT ÇİFTDEMİR
MUTLU ÇOBANOĞLU
AHMET DAĞTEKİN
SEDAT DALBAYRAK
ALİ DALGIÇ
GÖKHAN DEMİRKIRAN
FATİH ERSAY DENİZ
ALİHAN DERİNCEK
FATİH DİKİCİ
ŞEREF DOĞAN
ÜNSAL DOMANİÇ
JOHN M. DUFF
HAKAN EMMEZ
MERİÇ ENERCAN
UYGUR ER
MEHMET NURİ ERDEM
SERKAN ERKAN
H. YENER ERKEN
TAHSİN ERMAN
NURULLAH ERMİŞ
KÂMİL EYVAZOV
JÖRG FRANKE
YURDAL GEZERCAN
ÜMİT ÖZGÜR GÜLER
MAHİR GÜLŞEN
AHMET GÜRHAN GÜRÇAY
HÜRRİYET GÜRSEL YILMAZ
ASLAN GÜZEL
ERSİN HACIYAKUPOĞLU
AZMİ HAMZAOĞLU
MURAT HANCI
FERHAT HARMAN
MURAT İMER
YASHAR R. JALİLOV
SERDAR KABATAŞ
SERDAR KAHRAMAN
MURAT KALAYCI
ERDAL KALKAN
ERKAN KAPTANOĞLU
EMRE KARADENİZ
AZİZ KARAOĞLU
OĞUZ KARAEMİNOĞULLARI
FEYZA KARAGÖZ GÜZEY
DENİZ KARGIN
MEHMET AKİF KAYGUSUZ
FATİH KESKİN
ESAT KITER
R. KEMAL KOÇ
SERGEY KOLESOV
DENİZ KONYA
M. FATİH KORKMAZ
CAN KOŞAY
KADİR KOTİL
AHMET KÜÇÜK
THOMAS LÜBBERS
IONNAS MAGRAS
ABTULLAH MİLCAN
MURAT MÜSLÜMAN
VUGAR NABİYEV
SAİT NADERİ
IBRAHIM OBEID
ENDER OFLUOĞLU
KAAN OYSUL
NUSRET ÖK
TUNÇ ÖKTENOĞLU
ALİ ÖNER
CUMHUR ÖNER
METİN ÖZALAY
HAKAN ÖZALP
ZÜHTÜ ÖZBEK
NAİL ÖZDEMİR
RAİF ÖZDEN
SERMİN ÖZKAL
CENK ÖZKAN
A. MURAT ÖZTÜRK
ÇAĞATAY ÖZTÜRK
SELÇUK PALAOĞLU
MEHDİ SASANİ
SAFA SATOĞLU
HALİL İBRAHİM SEÇER
ALTAY SENCER
ERHAN SESLİ
FIRAT SEYFETTİNOĞLU
İLKER SOLMAZ
MURAT SONGÜR
ERKİN SÖNMEZ
YETKİN SÖYÜNCÜ
HASAN KÂMİL SUCU
HALİL İBRAHİM SÜNER
CÜNEYT ŞAR
ALİ ŞEHİRLİOĞLU
ALPASLAN ŞENEL
ALPASLAN ŞENKÖYLÜ
SERKAN ŞİMŞEK
SAİT ŞİRİN
MEHMET ALİ TALMAÇ
CÜNEYT TEMİZ
MEHMET TEZER
BİLGEHAN TOSUN
KUDRET TÜREYEN
BEKİR YAVUZ UÇAR
AKIN UĞRAŞ
M. ONUR ULU
HİKMET ULUĞ
MUSTAFA UYSAL
ONAT ÜZÜMCÜGİL
EROL YALNIZ
TARIK YAZAR
MUHARREM YAZICI
İ. ÇAĞLAR YILGÖR
AHMET YILMAZ
ATİLLA YILMAZ
TEVFİK YILMAZ
MEHMET ZİLELİ

Bilimsel Program

3 Nisan 2019, ÇARŞAMBA — SALON 1

09:00 KAYIT

12:30-13:30 Lunch

AOSPINE PREMEETING COURSE IN TSS BIANNUAL CONGRESS
ADULT SPINAL DEFORMITY
Course Directors: Alpaslan Şenköylü, Deniz Konya

13:55-15:00 SESSION 1
Moderators: Mehmet Zileli, Esat Kiter

13:55-14:00	Welcome and introduction to AOSpine	*Alpaslan Şenköylü*
14:00-14:12	Classification of ASD	*Deniz Konya*
14:12-14:24	Natural history of de novo deformity	*Murat Songür*
14:24-14:36	Limited surgical options for de novo deformity	*Mehmet Zileli*
14:36-14:48	Case example-Treatment of de novo deformity	*Emre Acaroğlu*
14:48-15:00	Discussion	

15:00-16:00 SESSION 2
Moderators: Azmi Hamzaoğlu, Serdar Kahraman

15:00-15:12	Treatment strategies in neglected AIS	*Alpaslan Şenköylü*
15:12-15:24	Sagittal spinopelvic parameters and practical usage in daily routine	*Ibrahim Obeid*
15:24-15:36	Case example-Practical usage of spinopelvic parameters	*Ibrahim Obeid*
15:36-15:48	Preop planning in ASD (fusion levels and need for correction)	*Ahmet Alanay*
15:48-16:00	Discussion	

16:00-16:30 Coffee Break

16:30-17:20 SESSION 3
Moderators: Cumhur Öner, Serkan Şimşek

16:30-16:42	Surgical techniques for poor bone quality	*Azmi Hamzaoğlu*
16:42-16:54	Treatment of Junctional problems	*Esat Kıter*
16:54-17:06	Case example - Complications of ASD surgery	*Cumhur Oner*
17:06-17:20	Discussion	

17:20-18:15 SESSION 4
Moderators: Ufuk Aydınlı, Deniz Konya

17:20-17:40	Osteotomy techniques and indications - video presentation	*Ufuk Aydınlı*
17:40-17:52	Decision making of cervical deformity evaluation	*Serdar Kahraman*
17:52-18:04	Surgical management of cervical deformity	*Serkan Şimşek*
18:04-18:15	Discussion	
18:15	Closing remarks	*All Faculty*

3 Nisan 2019, ÇARŞAMBA — SALON 2

PREMEETING COURSE / LOMBER ENDOSKOPİK DİSK CERRAHİSİ

Kurs Başkanları: Sait Naderi, Oğuz Karaeminoğulları

14:30-16:00 1. OTURUM

Oturum Başkanları: Tarık Yazar, Hikmet Uluğ

14:30-14:45	İntervertebral foramen ve Kambin üçgeni: Endoskopik anatomi	*Kadir Birler*
14:45-15:00	Transforaminal endoskopik diskektomi: Nasıl yapıyorum?	*Oğuz Karaeminoğulları*
15:00-15:15	Transforaminal endoscopic discectomy: Tips for success	*Thomas Lübbers*
15:15-15:30	İnterlaminer diskektomi: Teknik	*Kadir Birler*
15:30-15:45	Endoskopik omurga cerrahisi, lokal anestezi: Nasıl uygularım?	*Yener Erken*
15:45-16:00	Tartışma	

16:00-16:30 Kahve Molası

16:30-18:00 2. OTURUM

Oturum Başkanları: Sait Naderi, Oğuz Karaeminoğulları

16:30-16:45	Far lateral disk herniasyonlarında endoskopik diskektomi	*Altay Sencer*
16:45-17:00	İnterlaminer veya transforaminal diskektomi: Hangisi, ne zaman?	*Hikmet Uluğ*
17:00-17:15	Unilateral biportal endoskopik diskektomi - S. Stenoz	*Tarık Yazar*
17:15-17:30	Endoscopic discectomy: From present to future	*Thomas Lübbers*
17:30-17:45	Unilateral biportal endoskopik cerrahi	*Hayati Aygün*
17:45-18:00	Tartışma	
18:00	Kapanış	

4 Nisan 2019, PERŞEMBE — SALON 1

07:00-08:00 SÖZLÜ BİLDİRİLER 1 *(Adölesan İdiopatik Skolyoz)*

Oturum Başkanları: Murat Müslüman, Serkan Erkan

OP-001 Prevalence of Thoracic Scoliosis in Adolescents: Analysis of 1065 Chest Radiographs with A Comprehensive Review of Adolescent Scoliosis Prevalence in the World
Murat Şakir Ekşi, Emel Ece Özcan Ekşi, Mehmet Akif Akçal

OP-002 Thoracoscopic Vertebral Body Tethering for Adolescent Idiopathic Scoliosis: Mid-term Results of 24 Patients
Tuna Pehlivanoğlu, İsmail Oltulu, Ender Ofluoğlu, Ender Sarıoğlu, Güray Altun, Murat Korkmaz, Kerem Yıldırım, Mehmet Aydoğan

OP-003 Distal junctional sagittal plane analysis of Lenke 3, 5 and 6 AIS patients according to lowest instrumented vertebra selection
Hakan Serhat Yanık, İsmail Emre Ketenci, Adnan Behçet Kafadar, Özgür Erdoğan, Şevki Erdem

OP-004 The Results Of Ponte Osteotomy In Adolescent Idiopathic Sciolosis Surgery
Ahmed Arif Uzun, Sinan Yılar, Mehmet Köse, Kutsi Tuncer, Mehmet Cenk Turgut

OP-005 The Effect Of the Usage Of Cell-Saver and Tranexamic acid on the Amount of İntraoperative Allogenic Blood Transfusion While Managing Blood Loss in Adolescent İdiopathic Scoliosis Surgery
Deniz Kargin, Özgür İsmail Türk, Mustafa Akif Aşansu, Ali Öner, Gizem İlvan, Akif Albayrak

OP-006 Respiratory Function in Adolescents: Mild Idiopathic Scoliosis Patients and Healthy Individuals
Büşra Yıldırım, Hürriyet Gürsel Yılmaz, Aslıhan Kuşvuran Özkan

OP-007 Evaluation Of The Parameters Affecting Respiratory Functions At Adolescent Idiopathic Scoliosis Patients
Osman Çimen, Ali Öner, Alper Köksal, Mehmet Akif Kaygusuz

OP-008 "A Successful Scoliosis Screening Programme" is it Possible in Turkey?
Emre Karadeniz, Ferhat Öktem, Kaya Memişoğlu, Bilgehan Tosun, Cumhur Cevdet Kesemenli

OP-009 The Effects of Brace Treatment on Spinopelvic Alignment in Patients with Adolescent Hyperkyphosis
Hürriyet Gürsel Yilmaz, Ahsen Büyükaslan, Kadir Abul

OP-010 Braced and Weaned vs Braced and Operated Adolescent Idiopathic Scoliosis Patients: A Matched Cohort Analysis
Ahsen Buyukaslan, Kadir Abul, Altug Yucekul, Berat Yuksel, Mohamed Dalla, Atahan Durbas, Caglar Yilgor, Yasemin Yavuz, Hurriyet Gursel Yilmaz, Ahmet Alanay

4 Nisan 2019, PERŞEMBE — SALON 1

08:00-09:00 AÇILIŞ VE YILIN BİLDİRİLERİ

Oturum Başkanları: R. Kemal Koç, Ali Şehirlioğlu

08:00-08:05 Açılış Konuşmaları — *R. Kemal Koç, Ali Şehirlioğlu*

08:05-08:10 Prof. Dr. Can Solakoğlu Anısına — *Ali Şehirlioğlu*

08:10-09:00 Yılın Bildirileri

NP-01 Thoracoscopic Vertebral Body Tethering for Adolescent Idiopathic Scoliosis: Clinical Judgment of Initial Correction Need and Follow-Up Curve Behavior According to Sanders Skeletal Maturity Staging System
Ahmet Alanay, Altug Yucekul, Kadir Abul, Gokhan Ergene, Sahin Senay, Binnaz Ay, Barbaros Omer Cebeci, Murat Pekmezci, Suna Lahut, Yasemin Yavuz, Caglar Yilgor

NP-02 Any Vertebral Segment May be Chosen as Upper-Instrumented Vertebra if Ideal Individualized Sagittal Shape and Alighment is Reached
Caglar Yilgor, Suna Lahut, Yasemin Yavuz, Kadir Abul, Altug Yucekul, Peri Kindan, Ercan Yurttaser, Javier Pizones, Ibrahim Obeid, Frank Kleinstueck, Fransisco Javier Sanchez Perez Grueso, Emre Acaroglu, Ferran Pellise, Ahmet Alanay, Essg European Spine Study Group

NP-03 "Reconstruction of the Basement" Rather Than "Adding a Story" is More Effective in Preventing Re-Pjk in Adult Spinal Deformity Patients
Caglar Yilgor, Suna Lahut, Yasemin Yavuz, Kadir Abul, Altug Yucekul, Fırat Gulagacı, Omer Orhun, Louis Boissiere, Ibrahim Obeid, Frank Kleinstueck, Fransisco Javier Sanchez Perez Grueso, Emre Acaroglu, Ferran Pellise, Ahmet Alanay, Essg European Spine Study Group

NP-04 Clinical, Radiological and HRQoL Outcomes after Selective Thoracic Fusion with Minimum 15 Years Follow-up
Sinan Kahraman, Yunus Emre Akman, Huseyin Ozturk, Tunay Sanli, Meric Enercan, Selhan Karadereler, Azmi Hamzaoglu

NP-05 Assessment of Sagittal Shape and Alıgnment Using Short-Cassette Radiographs and Intraoperative Fluoroscopic Images for Predicting Mechanical Complications
Caglar Yilgor, Altug Yucekul, Ipek Ege Gurel, Umut Can Karaaslan, Tais Zulemyan, Yasemin Yavuz, Louis Boissiere, Ibrahim Obeid, Frank Kleinstueck, Francisco Javier Sanchez Perez Grueso, Emre Acaroglu, Ferran Pellise, Ahmet Alanay, Essg European Spine Study Group

NP-06 Does Cervical Instantaneous Centre of Rotation Change After Scoliosis Surgery
Ali Asma, Haluk Berk

4 Nisan 2019, PERŞEMBE — SALON 1

NP-07 Vertebral Body Tethering vs Posterıor Instrumentatıon and Fusion for Adolescent Idiopathic Scolıosıs: A Matched Cohort Analysis
Altug Yucekul, Omer Orhun, Barkin Erdogan, Tais Zulemyan, Gokhan Ergene, Sahin Senay, Binnaz Ay, Yasemin Yavuz, Caglar Yilgor, Ahmet Alanay

NP-08 Effect of mesenchymal stem cell and erythropoietin combination in a rat spinal fusion model
Ahmet Burak Bilekli, Çağrı Neyişci, Yusuf Erdem, Ömer Erşen, Erbil Oğuz

09:00-10:00 DESTRÜKTİF PATOLOJİLERİN AYIRICI TANISI
Oturum Başkanları: Haluk Berk, Ahmet Dağtekin

09:00-09:10	Tümör mü? Enfeksiyon mu? Kırık mı?	*Feyza Karagöz Güzey*
09:10-09:20	Benign mi? Malign mi? Ne zaman biyopsi?	*Murat Öztürk*
09:20-09:35	Infections of the spine	*Ioannis Magras*
09:35-09:50	Role of percutaneous endoscopic surgery in destructive spinal disorders	*Thomas Lübbers*
09:50-10:00	Tartışma	

10:00-10:30 Kahve Molası

10:30-11:30 KONFERANS-1
Oturum Başkanları: Serkan Şimşek, Cüneyt Şar

10:30-10:45	Subaxial cervical injury: Classification and management	*Ioannis Magras*
10:45-11:00	Complications in spinal surgery: How to avoid, diagnose and treat?	*Cumhur Öner*
11:00-11:15	Konjenital skolyoz: Hangi deformiteye ne zaman müdahale edelim?	*Muharrem Yazıcı*
11:15-11:30	Discussion	

11:30-12:45 PİYOJENİK ENFEKSİYONLAR
Oturum Başkanları: Azmi Hamzaoğlu, Ali Dalgıç

11:30-11:45	Medikal tedavi ve akılcı ilaç kullanımı	*Vildan Avkan Oğuz*
11:45-11:57	Predispozan faktörler ve tanı	*Altay Sencer*
11:57-12:09	Nörolojik defisitli piyojenik enfeksiyon	*Tunç Öktenoğlu*
12:09-12:21	Hangi cerrahi yöntem?	*Fatih Dikici*
12:21-12:36	3D modeling in surgical planning	*Sergey Kolesov*
12:36-12:45	Tartışma	

12:45-13:30 Öğle Yemeği

4 Nisan 2019, PERŞEMBE — SALON 1

13:30-14:30 ADOLESAN İDİOPATİK SKOLYOZ: LENKE 1 VE 2 EĞRİLİKLERDE TARTIŞMALI KONULAR

Oturum Başkanları: Sedat Dalbayrak, Ömer Akçalı

13:30-13:35	Olgu sunumu	*Murat Songür*
13:35-13:47	Selektif torasik füzyon	*Azmi Hamzaoğlu*
13:47-13:59	Üst enstrümente vertebra seçimi ve omuz dengesi	*Ender Ofluoğlu*
13:59-14:11	Alt enstrümente vertebra seçimi	*Emre Acaroğlu*
14:11-14:23	Düzeltme tekniği	*Süleyman R. Çaylı*
14:23-14:30	Olgu çözümü ve tartışma	

14:30-15:30 ERKEN BAŞLANGIÇLI SKOLYOZ

Oturum Başkanları: Emre Acaroğlu, Süleyman R. Çaylı

14:30-14:35	Olgu sunumu	*Ferhat Harman*
14:35-14:45	Göğüs kafesi ve omurga büyümesi ile ilgili bilmem gerekenler	*Akın Uğraş*
14:45-14:55	Alçı tedavisi hangi vakalarda uygundur?	*Bülent Balioğlu*
14:55-15:07	Büyüme dostu implantlar: Avantajları ve dezavanatajları	*M. Fatih Korkmaz*
15:07-15:19	Modifiye uzayan rod ve band yöntemi	*Meriç Enercan*
15:19-15:30	Olgunun çözümü ve tartışma	

15:30-16:00 Kahve Molası

16:00-17:00 ADOLESAN İDİOPATİK SKOLYOZ KONSERVATİF TEDAVİSİ ve BACAK BOY FARKINA BAĞLI GELİŞEN SKOLYOZA YAKLAŞIM

Oturum Başkanları: Necdet Altun, Murat Altaş

16:00-16:05	Olgu sunumu	*Mutlu Çobanoğlu*
16:05-16:15	Skolyozda matüritenin değerlendirilmesi	*Emre Karadeniz*
16:15-16:25	Korse tedavisinde yeni yöntemler	*Hürriyet Yılmaz*
16:25-16:35	Vakaların ekstremite eşitsizliği değerlendirilmesi ve konservatif çözümü	*Hürriyet Yılmaz*
16:35-16:45	Cerrahi yöntemlerle çözümü	*Mahir Gülşen*
16:45-17:00	Olgunun çözümü ve tartışma	

17:00-18:00 SCHEUERMANN KİFOZU

Oturum Başkanları: Özkan Ateş, Mehmet Tezer

17:00-17:05	Olgu sunumu	*Raif Özden*
17:05-17:17	Etiyoloji ve doğal seyir	*Ahmet Gürhan Gürçay*
17:17-17:29	Klinik ve radyolojik değerlendirme	*Zühtü Özbek*
17:29-17:41	Cerrahi yaklaşımım nasıl olmalı?	*Haluk Berk*
17:41-18:00	Olgu çözümü ve tartışma	

4 Nisan 2019, PERŞEMBE — SALON 1

18:00-19:00 **SÖZLÜ BİLDİRİLER 2** *(Biyomekanik, Servikal, Diğer)*
Oturum Başkanları: M. Fatih Korkmaz, Fatih Keskin

OP-011 A Retrospective Comparison of Accuracy of Pedicle Screws İnsertion Among 3D-BT Navigation and Free Hand Technique in Spinal İnstrumentation Surgery
Burak Akesen, Eyyüp Çetiner

OP-012 Direct Vertebral Rotation Significantly Decreases the Pull-out Strength of the Pedicle Screw
Kerim Sarıyılmaz, Okan Özkunt, Halil Can Gemalmaz, Tunca Cingöz, Tuna Pehlivanoğlu, Murat Baydoğan, Fatih Dikici

OP-013 Biomechanical Comparison of Three Different Screw Designs in Osteoporotic Spine Fixation
Mustafa Sungur, Kerim Sariyilmaz, Okan Ozkunt, Tunca Cingoz, Halil Can Gemalmaz, Yakup Yurekturk, Murat Baydogan, Fatih Dikici

OP-014 Double Rod Technique in Patients with Cervical Spinal Stenosis. A novel modification of posterior cervical instrumentation
Tuna Pehlivanoğlu, İsmail Oltulu, Ender Ofluoğlu, Ender Sarıoğlu, Güray Altun, Murat Korkmaz, Kerem Yıldırım, Mehmet Aydoğan

OP-015 C5 Nerve Root Paresis After Posterior Cervical Laminectomy and Fusion
Ali Erhan Kayalar, Caner Sarıkaya, Ali Fatih Ramazanoğlu, Mehmet Resid Önen, Sait Naderi

OP-016 Reliability of Two Smartphone Applications in Scoliosis Cobb Angle Measurement
İsmail Emre Ketenci, Hakan Serhat Yanık, Özgür Erdoğan, Levent Adıyeke, Şevki Erdem

OP-017 Spine Surgery Fellowship Training in Turkey
Kadir Abul, Çağlar Yılgör, Akif Albayrak, Meriç Enercan, Engin Çetin, Volkan Kaya, Erdem Özden

OP-018 Survey Monkey results of Turkish Spine Surgeons to most frequently asked questions about AIS
Kursat Kara, Ufuk Aydinli

OP-019 Efficacy of Impar Ganglion Blockade in Patients with Chronic Coccidia
Mehmet Akif Çaçan

OP-020 Pelvic Incidence as a Prognostic Factor in Coccydynia
Ömer Erşen, Ender Sir, Sami Eksert, Ahmet Burak Bilekli, Aydan Örsçelik, Tolga Ege

4 Nisan 2019, PERŞEMBE — SALON 2

13:30-14:30 SERVİKAL DEJENERATİF OMURGA

Oturum Başkanları: Mahir Gülşen, Ersin Hacıyakupoğlu

13:30-13:42	Servikal disk protezi güncel durum	*Murat Müslüman*
13:42-13:54	3 veya daha fazla seviye servikal disk hernisinde yönetim	*Yunus Atıcı*
13:54-14:06	Servikal deformitede cerrahi	*Kadir Kotil*
14:06-14:18	Servikal füzyon sonrası komşu segment patolojileri	*Mehmet Nuri Erdem*
14:18-14:30	Tartışma	

14:30-15:30 TORAKAL DEJENERATİF OMURGA

Oturum Başkanları: Erdal Coşkun, Tarık Yazar

14:30-14:42	Torakal yumuşak disk hernisinde cerrahi yaklaşımlar	*Serdar Kabataş*
14:42-14:54	Torakal kalsifiye disk hernisinde cerrahi yaklaşımlar	*Murat İmer*
14:54-15:06	Torakal stenozda cerrahi yaklaşımlar	*Alparslan Şenel*
15:06-15:18	Tandem spinal cerrahi	*Uygur Er*
15:18-15:30	Tartışma	

15:30-16:00 Kahve Molası

16:00-17:00 LOMBER DEJENERATİF OMURGA

Oturum Başkanları: Alparslan Şenel, Bekir Yavuz Uçar

16:00-16:12	Rekürren disk herniasyonunda ne zaman enstrümantasyon ve füzyon	*Mustafa Çeliktaş*
16:12-16:24	Lomber stenozda ne zaman füzyon cerrahisi?	*Tarık Yazar*
16:24-16:36	Lomber stenozda hemilaminotomi bilateral dekompresyon	*Kudret Türeyen*
16:36-16:48	Lomber stenoz ve düz bel varlığında yönetim	*Suat Canbay*
16:48-17:00	Tartışma	

17:00-18:00 SPONDİLOLİSTEZİS

Oturum Başkanları: Alpaslan Şenköylü, Cüneyt Temiz

17:00-17:12	Spondilolisteziste yeni sınıflandırmalar ve ne zaman cerrahi?	*Ümit Özgür Güler*
17:12-17:24	İstmik spondiloliziste defekt tamiri	*Çağatay Öztürk*
17:24-17:36	Spondilolisteziste ne kadar redüksiyon	*Can Koşay*
17:36-17:48	Yüksek dereceli spondilolisteziste cerrahi	*Cüneyt Temiz*
17:48-18:00	Tartışma	

18:00-19:00 SPESİFİK SPİNAL ENFEKSİYON

Oturum Başkanları: Ünsal Domaniç, Vildan Avkan Oğuz

18:00-18:12	Spesifik spinal enfeksiyonlarda medikal tedavi	*Vildan Avkan Oğuz*
18:12-18:24	Spinal tüberkülozda ne zaman cerrahi	*Teoman Benli*
18:24-18:36	Spinal kist hidatik yönetimi	*Yurdal Gezercan*
18:36-18:48	Spinal brusella ve fungal enfeksiyonlar	*Ahmet Dağtekin*
18:48-19:00	Tartışma	

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07:00-08:00 **SÖZLÜ BİLDİRİLER 3** *(Adolesan İdiopatik Skolyoz ve Adult Spinal Deformite)*
Oturum Başkanı: Atilla Yılmaz, Ümit Özgür Güler

OP-021 Which Factors Sffect the Radiographic and Clinical Outcomes in Selective Posterior Lumbar Fusion (Cobb to Cobb) for Lenke Type 5 Curves in AIS: The importance of Sacral Oblique Take-off Angle for Fractional Lumbosacral Curve
Sinan Kahraman, Yunus Emre Akman, Huseyin Ozturk, Tunay Sanli, Meric Enercan, Selhan Karadereler, Azmi Hamzaoglu

OP-022 Comparison of Radiologic and Functional Outcomes According to Distal Fusion Level in Lenke Type 3, 5 and 6 Adolescent Idiopathic Acoliosis
İsmail Emre Ketenci, Hakan Serhat Yanık, Adnan Behçet Kafadar, Murat Bakır, Şevki Erdem

OP-023 Lenke 5 Curves. Is Thoracic Fusion Really Necessary?
Gokhan Karademir, Kerim Sarıyılmaz, Okan Özkunt, Halil Can Gemalmaz, Turgut Akgül, Murat Korkmaz, Fatih Dikici, Ünsal Domaniç

OP-024 Comparison of Short Level (Selective) and Long Level (Nonselective) Fusion with Posterior Approach in Lenke Type 5C Adolescent Idiopathic Scoliosis Patients
Süleyman Kasım Taş, Akif Albayrak, Deniz Kargın, Cem Yetkin, Mehmet Akif Kaygusuz

OP-025 Can Discharge Time be Affected by Haemoglobin Level Change in Scoliosis Surgery?
Sibel Büyükçoban, İsmail Safa Satoğlu

OP-026 Time-Dependent Interpretation of Mechanical Complications Using Cox Regression and Survival Analysis
Caglar Yilgor, Altug Yucekul, Can Berk Asaroglu, Duhan Kilickan, Tais Zulemyan, Duru Karasoy, Yasemin Yavuz, Sleiman Haddad, Ibrahim Obeid, Frank Kleinstueck, Fransisco Javier Sanchez Perez Grueso, Emre Acaroglu, Ferran Pellisé, Ahmet Alanay, Essg European Spine Study Group

OP-027 Correlations of Pelvic Incidence-Based Relative Radiographic Parameters To Lower Extremity Compensations
Altug Yucekul, Barkin Erdogan, Duhan Kilickan, Caglar Yilgor, Tais Zulemyan, Yasemin Yavuz, Javier Pizones, Ibrahim Obeid, Frank Kleinstueck, Francisco Javier Sanchez Perez Grueso, Emre Acaroglu, Ferran Pellisé, Ahmet Alanay, Essg European Spine Study Group

OP-029 Artificial Intelligence Based Hierarchical Clustering of Patient Types and Intervention Categories in Adult Spinal Deformity Surgery: Towards a New Classification Scheme That Predicts Quality and Value
Christopher Ames, Justin Smith, Ferran Pellise, Michael Kelly, Ahmet Alanay, Emre Acaroglu, Francisco Javier Sanchez Pérez Grueso, Frank Kleinstück, Ibrahim Obeid, Douglas Burton, Virginie Lafage, Frank Schwab, Christopher Shaffrey, Shay Bess, Miquel Serra Burriel, Essg European Spine Study Group, Issg International Spine Study Group

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OP-028 Sagittal Spinal Alignment After Reconstruction of Neglected Hip Dysplasia With a Total Hip Arthroplasty: Does Changing The Distorted Mechanics of Hip Normalizes Spinal Alignment?
Mehmet Kaymakoğlu, Samet Işık, Ömür Çağlar, Halil Gökhan Demirkıran, Bülent Attila, Muharrem Yazıcı

OP-030 Does İntraoperative Lateral x-ray in Prone Position Change the Preoperative Surgical Plan in Treatment of Adult Spinal Deformity?
Huseyin Ozturk, Yunus Emre Akman, Sinan Kahraman, Tunay Sanli, Meric Enercan, Selhan Karadereler, Azmi Hamzaoglu

08:00-09:00 OMURGA TÜMÖRLERİ
Oturum Başkanları: Mahmut Argün, Kadir Kotil

08:00-08:12	Sık görülen omurga tümörlerine patolojik yaklaşım ve tanı süreçleri	*Sermin Özkal*
08:12-08:24	Üst servikal tümörlerde cerrahi yaklaşım	*Serkan Şimşek*
08:24-08:36	Üst servikal tümörlerde endoskopik yaklaşım	*Şükrü Çağlar*
08:36-08:48	Vertebral arter mobilizasyonu ve tümör çıkarılması	*R. Kemal Koç*
08:48-09:00	Tartışma	

09:00-10:00 SAKRAL TÜMÖRLER
Oturum Başkanları: Murat Hancı, Akif Albayrak

09:00-09:12	Sakrumu sık tutan tümörler	*Özkan Ateş*
09:12-09:24	Parsiyel sakrektomiyi nasıl yapıyorum?	*Ufuk Aydınlı*
09:24-09:36	Total sakrektomiyi nasıl yapıyorum?	*Erkan Kaptanoğlu*
09:36-09:48	Kemik ve yumuşak doku rekonstrüksiyonu	*Ufuk Aydınlı*
09:48-10:00	Tartışma	

10:00-10:30 Kahve Molası

10:30-11:30 KONFERANS 2
Oturum Başkanları: Ufuk Aydınlı, Erkan Kaptanoğlu

10:30-10:45	Complex reconstruction of the craniocervical junction for neoplastic lesions	*John M. Duff*
10:45-11:00	Spinal metastases: combined less invasive treatment options	*Cumhur Öner*
11:00-11:15	Minimally invasive surgery for metastatic disease	*John M. Duff*
11:15-11:30	Discussion	

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11:30-12:10 KONFERANS 3

Oturum Başkanları: Selçuk Palaoğlu, Teoman Benli

11:30-11:45	Extended indications for endoscopic surgery in lumbar degenerative processes	*Thomas Lübbers*
11:45-12:00	Dejeneratif spondilolistezisin cerrahi tedavisi ve geç sonuçları	*Yashar R. Jalilov*
12:00-12:10	Tartışma	

12:10-12:30 BAŞKANLIK KONFERANSI

Oturum Başkanı: Emin Alıcı

12:10-12:25	Metastatik omurga tümörlerinde güncel yaklaşımlar	*Sait Naderi*
12:25-12:30	Tartışma	

12:30-13:30 Öğle Yemeği

13:30-14:30 POSTOPERATİF SPİNAL ENFEKSİYONLAR

Oturum Başkanları: Can Koşay, Kudret Türeyen

13:30-13:42	Predispozan faktörler ve kırmızı bayraklar	*Safa Satoğlu*
13:42-13:54	Postop diskit	*Murat Hancı*
13:54-14:06	İmplant-greft varlığında cerrahi enfeksiyonlar	*Cenk Özkan*
14:06-14:12	Geç gelişen enfeksiyon ve doku reaksiyonları	*Murat Kalaycı*
14:12-14:30	Tartışma	

14:30-15:30 PİYOJENİK ENFEKSİYONLAR ve DEFORMİTE CERRAHİSİNDE POSTOPERATİF ENFEKSİYON

Oturum Başkanları: Feyza Karagöz Güzey, Fatih Dikici

14:30-14:35	Olgu sunumu (Piyojenik enfeksiyon)	*Fatih Keskin*
14:35-14:45	Ben nasıl yaparım?	*Yetkin Söyüncü*
14:45-14:55	Ben nasıl yaparım?	*Hasan Kamil Sucu*
14:55-15:00	Olgunun çözümü ve tartışma	
15:00-15:05	Olgu sunumu (Deformite cerrahisinde postoperatif enfeksiyon)	*Deniz Kargın*
15:05-15:15	Ben nasıl yaparım?	*Gökhan Demirkıran*
15:15-15:25	Ben nasıl yaparım?	*Murat Altaş*
15:25-15:30	Olgunun çözümü ve tartışma	

15:30-16:00 Kahve Molası

16:00-17:00 MAKALE DİSEKSİYONU

Oturum Başkanları: Esat Kıter, Metin Özalay

Spinal Travma

Alpaslan Şenköylü, Serdar Kahraman, Bilgehan Tosun, Sait Naderi, Erkin Sönmez

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17:00-18:00 OSTEOPOROTİK OMURGA

Oturum Başkanları: Murat İmer, Mehmet Akif Kaygusuz

17:00-17:12	Osteoporozda medikal ve konservatif tedavi	*Fırat Seyfettinoğlu*
17:12-17:24	Osteoporotik vertebra kırıklarında tedavi stratejisi ve cerrahi zamanlama	*Tevfik Yılmaz*
17:24-17:36	Ne zaman kifoplasti/vertebroplasti? Ne zaman unilateral /bilateral yaklaşım?	*Atilla Yılmaz*
17:36-17:48	Osteoporotik omurgada enstrümantasyon ve füzyon	*Akif Albayrak*
17:48-18:00	Tartışma	

18:00-19:00 GENEL KURUL

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07:00-08:00 SÖZLÜ BİLDİRİLER 4 *(Dejeneratif Omurga)*

Oturum Başkanları: Akın Uğraş, Yurdal Gezercan

OP-031 Are Plain Radiographs Accurate for Detection and Classification of Lumbosacral Transitional Vertebrae?
Kadir Büyükdoğan, Yenel Gürkan Bilgetekin

OP-032 Outcomes of the Lumbar Facet joint Cyst Excision with a Minimally Invasive Method
Barış Polat, Halil İbrahim Seçer

OP-033 The Effects Of Lumbar Facet Joint Osteoarthropathy On Patient Clinic: Computed Tomography Osteoabsorptiometry Findings
Safiye Sanem Dereli Bulut, Yasar Bukte, Sait Naderi

OP-034 The Presacral Retroperitoneal Approach for Axial Lumbar Interbody Fusion for Lomber Pseudoarthrozis
Alper Kurtoğlu, Mustafa Erkan İnanmaz, İsmail Daldal, Ahmet Çağrı Uyar

OP-035 Does Enhanced Recovery After Surgery Protocol Change Cost and Outcome in Single Level Lumbar Microdiscectomy
Ebru Tarikçi Kiliç, Tuncay Demirbilek, Sait Naderi

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OP-036 Spinal Anesthesia Shortens the Recovery Time after Lumbar Disc Surgeries: A Randomized Prospective Study
Ebru Tarıkçı Kiliç, Mehmet Salim Akdemir, Necmi Onur Taştan, Sait Naderi

OP-037 Lateral Interpedicular and Lateral Interpedicular Transmuscular Approach in The Surgical Treatment of Lumbar Far Lateral Disc Herniation
Halil Can

OP-038 Clinical Outcomes of Bilateral Decompression via Unilateral Approach in Lumbar Spinal Stenosis
Mustafa Kemal İlik

OP-040 Clinical and Radiological Comparison of Posterolateral Fusion and Posterior Interbody Fusion Techniques for Multilevel Lumbar Spinal Stabilization In Manual Workers
Kadri Yildiz, Hayati Aygün

OP-039 Sagittal Shape and Alıgnment of The Lumbar Spine: Another Factor Governing Adjacent Segment Degeneration
Caglar Yilgor, Dominique A. Rothenfluh, Jeremy Ct Fairbank, Yasemin Yavuz, Anand H. Segar, Ahmet Alanay, Ann F. Mannian

13:30-14:30 UZMANA SOR: BENIGN OMURGA TÜMÖRLERİ (VAKA BAZLI TARTIŞMA)
Oturum Başkanları: Süleyman R. Çaylı, Mehmet Ayvaz

13:30-13:42	Agresif hemanjiom	*Fatih Ersay Deniz*
13:42-13:54	Osteoid osteoma	*Ali Öner*
13:54-14:06	Eosinofilik granülom	*Ali Dalgıç*
14:06-14:18	Osteoblastom	*Yetkin Söyüncü*
14:18-14:30	Tartışma	

14:30-15:30 PRİMER AGRESİF VE MALİGN OMURGA TÜMÖRLERİ
Oturum Başkanları: Çağatay Öztürk, Ferhat Harman

14:30-14:35	Olgu sunumu	*Hakan Özalp*
14:35-14:50	Dev hücreli tümör	*Mehmet Ayvaz*
14:50-15:05	Multipl myelomda yaklaşım	*Sait Şirin*
15:05-15:20	Sarkomlar	*Ufuk Aydınlı*
15:20-15:30	Olgunun çözümü ve tartışma	

15:30-16:00 Kahve Molası

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16:00-17:00 ERİŞKİNDE SAGİTAL DENGE VE SPİNOPELVİK PARAMETRELERİN RESTORASYONU
Oturum Başkanları: Onat Üzümcügil, Ender Ofluoğlu

16:00-16:05	Olgu sunumu	*Nuri Eralp Çetinalp*
16:05-16:15	Yaşlanan omurgada spinopelvik kompensatuvar mekanizmalar	*Ahmet Küçük*
16:15-16:30	Kişiye özel sagital plan analizi	*Çağlar Yılgör*
16:30-16:45	Sagital dengenin restorasyonunda osteotomiler	*Ömer Akçalı*
16:45-17:00	Olgunun çözümü ve tartışma	

17:00-18:00 UZUN SEGMENT ENSTRÜMANTASYONDA PELVİK FİKSASYON
Oturum Başkanları: Bilgehan Tosun, Nail Özdemir

17:00-17:12	Uzun segment enstrümantasyonda implant yetmezliği nasıl önlenir?	*Mehmet Ali Talmaç*
17:12-17:24	Pelvik fiksasyon: Biyomekanik olarak hangi yöntem üstün?	*Onat Üzümcügil*
17:24-17:36	İliak vidalama ile spinopelvik fiksasyon-teknik	*Sedat Dalbayrak*
17:36-17:48	Spinopelvik fiksasyonda iliak vida alternatifleri	*Esat Kıter*
17:48-18:00	Tartışma	

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07:00-08:00 SÖZLÜ BİLDİRİLER 5 *(Destrüktif, MIS, Travma)*
Oturum Başkanları: Suat Erol Çelik, Yunus Atıcı

OP-046 Single Stage Posterior Total Vertebrectomy (PVCR) and Circumferential Reconstruction for Unstable Thoracal/Thoracolumbar(T/TL) Burst Fractures with/without Neurological Deficit: Clinical, Neurological and Radiological Outcomes
Yunus Emre Akman, Sinan Kahraman, Huseyin Ozturk, Tunay Sanli, Meric Enercan, Selhan Karadereler, Azmi Hamzaoglu

OP-042 Spinal Vascular Malformations: A Retrospectıve Analysıs of 32 Cases
Duygu Dölen, Mehmetzeki Yıldız, İlyas Dolaş, Mehmet Barburoğlu, Halil Can, Haydar Huseynov, Aydın Aydoseli, Yavuz Aras, Pulat Akın Sabancı, Nebiye Serra Sencer, Altay Sencer, Ali Ekrem Adıyaman

OP-043 Bilateral Ramus Communicans Nerve Pulse RF For Painful Osteoporotic Thoracal Vertebral Compression Fractures
H. Evren Eker, Ahmet Yılmaz, Metin Özalay

OP-044 Clinical Outcomes of a Series of 11 Patients With Sacrectomy
Semih Kıvanç Olguner, Emre Bilgin, Ali İhsan Ökten

OP-045 Surgical Advantages Using 3D - Patient Specific Models In High-Energy Thoracolumbar Fracture-Dislocation
Anıl Murat Öztürk, Mehmet Asım Özer, Onur Süer, Okan Derin, Efe Kemal Akdoğan, Figen Govsa, Ömer Akçalı

OP-041 Minimally İnvasive Solutions of Complicated Degenerative Compressive Lumbar Spinal Lesions
İsmail Yüce, Okan Kahyaoglu, Halit Cavusoglu, Yunus Aydın

OP-047 Unilateral Posterior Surgery for Osteoporotic Vertebrae Fractures. Modified Posterior Vertebral Colon Resection Combined with the Insertion of an Expandable Cage: How safe and effective is that approach for geriatric population?
Tuna Pehlivanoğlu, Ender Ofluoğlu, İsmail Oltulu, Ender Sarıoğlu, Güray Altun, Murat Korkmaz, Kerem Yıldırım, Mehmet Aydoğan

OP-048 Comparison of SF 36 and SRS 22 Scores of Short-Level (Selective) and Long-Level (Nonselective) Fusion with Posterior Approach in Lenke Type 5C Adolescent Idiopathic Scoliosis Patients
Akif Albayrak

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OP-049 Comparıson of Short and Long Segment Instrumentation Wıth Closing Wedge Osteotomies For Thoracolumbar Kyphosıs Secondary to Ankylosing Spondylitis
İsmail Daldal, Mustafa Erkan İnanmaz, Alper Kurtoğlu, Ahmet Çağrı Uyar, Özgür Çicekli

OP-050 Deformity Correction in Severe Ankylosing Spondylitis With Combined Osteotomies
Görkem Kıyak, Tevfik Balıkçı, Murat Bezer

08:00-09:00 METASTATİK OMURGA TÜMÖRÜ 1
Oturum Başkanları: Sait Şirin, Alihan Derincek

08:00-08:12	Spinal tümörlerde kemoterapi	*Aziz Karaoğlu*
08:12-08:24	Spinal tümörlerde radyocerrahi mi? Radyoterapi mi?	*Kaan Oysul*
08:24-08:36	Omurga metastazlarında güçlendirme teknikleri	*Burak Akesen*
08:36-08:48	Omurga metastazlarında radikal cerrahi	*Onur Ulu*
08:48-09:00	Tartışma	

09:00-10:00 METASTATİK OMURGA TÜMÖRÜ 2
Oturum Başkanları: Erol Yalnız, Suat Canbay

09:00-09:12	Omurga metastazlarında prognostik skorlama sistemleri ve ne zaman cerrahi?	*Alihan Derincek*
09:12-09:24	Meme metastazlarında yönetim	*Mehmet Reşit Önen*
09:24-09:36	Renal hücreli metastazlarda yönetim	*Turgut Akgül*
09:36-09:48	Akciğer metastazlarında yönetim	*Mehdi Sasani*
09:48-10:00	Tartışma	

10:00-10:30 Kahve Molası

10:30-11:30 KONFERANS 4
Oturum Başkanları: Serdar Kahraman, Gökhan Demirkıran

10:30-10:45	EOS value in spine treatment	*Jörg Franke*
10:45-11:00	Cervical pedicle screws for 3 column stabilisation of neoplastic disease	*John M. Duff*
11:00-11:15	Are dynamic solutions still a valid option	*Jörg Franke*
11:15-11:30	Discussion	

11:30-12:30 SPİNAL CERRAHİYE YÖN VERENLER
Oturum Başkanları: Ali Şehirlioğlu, Şükrü Çağlar

11:30-11:42	Omurga cerrahisinde nereden nereye geldik	*Haluk Berk*
11:42-11:54	Benim akıl hocalarım (mentor) kim/kimlerdi?	*Selçuk Palaoğlu*
11:54-12:06	Bir omurga cerrahının günü nasıl geçiyor?/ omurga cerrahisinde tecrübe	*Ali Arslantaş*
12:06-12:18	Omurga cerrahisi eğitiminde geleceğe yönelik yaklaşımlar	*Ufuk Aydınlı*
12:18-12:30	Tartışma	

12:30-13:30 Öğle Yemeği

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13:30-14:30 SERVİKAL TRAVMA

Oturum Başkanları: Sedat Çağlı, Murat Bezer

13:30-13:42	Atlas kırıklarının tedavisi	*Aslan Güzel*
13:42-13-54	Hangman kırıklarında karar verme ve cerrahi yöntem	*Erdal Coşkun*
13:54-14:06	Alt servikal travma sınıflama sistemleri ve güvenirliliği	*Vugar Nabiyev*
14:06-14:18	Faset kilitlenmesinin yönetimi	*Erol Yalnız*
14:18-14:30	Tartışma	

14:30-15:30 TORAKOLOMBER TRAVMA

Oturum Başkanları: Metin Özalay, Altay Sencer

14:30-14:42	Kurgu nasıl yapılmalı, yük paylaşım sistemi yeterli mi?	*Atilla Akbay*
14:42-14:54	Patlama kırığı füzyon gerekli mi?	*Murat Bezer*
14:54-15:06	Ne zaman anterior cerrahi?	*Tahsin Erman*
15:06-15:18	Travma sonrası geç gelen deformiteli olgu çözümleri	*Mustafa Uysal*
15:18-15:30	Tartışma	

15:30-16:00 Kahve Molası

16:00-17:00 ALT LOMBER VE SAKRAL TRAVMA

Oturum Başkanları: Erdal Kalkan, Mehmet Ali Talmaç

16:00-16:05	Olgu sunumu (Alt lomber kırık)	*Kamil Eyvazov*
16:05-16:17	Alt lomber kırıklarda yönetim	*İlker Solmaz*
16:17-16:30	Olgunun çözümü ve tartışma	
16:30-16:35	Olgu sunumu (Sakrum kırığı)	*Mert Çiftdemir*
16:35-16:47	Sakral kırıkların güncel sınıflaması ve yönetimi	*Serkan Erkan*
16:47-17:00	Olgunun çözümü ve tartışma	

17:00-18:00 ROMATOLOJİK KÖKENLİ DESTRÜKTİF SPİNAL LEZYONLAR

Oturum Başkanları: Erhan Sesli, Şeref Doğan

17:00-17:12	Ankilozan spondilit: Ankilozlu omurganın biyomekaniği, cerrahi karar verme	*Bilgehan Tosun*
17:12-17:24	Ankilozan spondilitli olgular ve çözümleri	*Mahir Gülşen*
17:24-17:30	Tartışma	
17:30-17:42	Romatoid artrit: Klinik ve radyolojik bulgular, cerrahi karar verme	*Ayhan Attar*
17:42-17:54	Romatoid artritli olgular ve çözümleri	*Sedat Çağlı*
17:54-18:00	Tartışma	

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07:00-08:00 SÖZLÜ BİLDİRİLER 6 *(Erken Başlangıçlı Skolyoz, Nöromüsküler Skolyoz)*
Oturum Başkanları: Serdar Kabataş, Murat Öztürk

OP-051 Surgery of Spine Deformity in Pediatric Patients with Paralytic Scoliosis Caused by Myelomeningocele
Çağrı Özcan, Sedat Duman, Bekir Yavuz Uçar

OP-052 Is Anterior Surgery an Absolute Necessity in Adolescents with Spina Bifida Who Have Long Segment Posterior Lamina Defect? Safety and Efficacy of All Posterior Instrumented Fusion
Buğrahan Şahin, Güney Yılmaz, Şenol Bekmez, Gökhan Halil Demirkıran, Muharrem Yazıcı

OP-053 Surgery of Spine Deformity in Pediatric Patients with Congenital Lumbar Kyphosis Caused by Myelomeningocele
Mehmet Salih Söylemez, Tayfun Aman, Bekir Yavuz Uçar

OP-054 Are We Right to be Afraid of Neuromuscular Spinal Deformity Surgery? The Effect of Two-Attending Surgeon, Consistent Surgical Team and Novel İntegrated Anesthesia Approach on the Outcomes
Mehmet Özgür Özhan, Sancar Bakırcıoğlu, Şenol Bekmez, Anıl Süzer, Halil Gökhan Demirkıran, Muharrem Yazıcı

OP-055 Is There a Relationship Between the Etiology of Coronal Plan Deformity in Adolescents and the Efficacy of Posterior Column Osteotomy? Idiopathic vs. Neuromuscular vs. Congenital
Ayaz Afandiyev, Alper Huseyin Yataganbaba, Senol Bekmez, Gokhan Halil Demirkiran, Mehmet Ayvaz, Muharrem Yazici

OP-056 The evaluation of vertebroplasty using extrapedicular percutaneous vertebral corpus access technique for osteoporotic vertebral fractures
Şeyho Cem Yücetaş, Necati Üçler

OP-057 Mid-length Pedicle Screws in Posterior Instrumentation of Scoliosis
Görkem Kıyak, Tevfik Balıkçı, Murat Bezer

OP-058 Lumbosacral Hemivertebra Resection via Posterior Approach: Radiological and Clinical Outcomes in the Mid-term Follow up. (min. 6 years, mean 10 years)
Yunus Emre Akman, Sinan Kahraman, Huseyin Ozturk, Tunay Sanli, Meric Enercan, Selhan Karadereler, Azmi Hamzaoglu

OP-059 Three-Dimensional Titanium Powder Printer & Layered Production With Laser Sintering For Spinal Implant Production: The Beginning of An Avant-Garde New Era?
Cüneyt Temiz, Enver Atik, Esra Zerina Apparuvather, Fatih Pıtır, Mustafa Barutçuoğlu

OP-060 What is the Unplanned Surgery Rate and Reasons in Early Onset Scoliosis Treated with Magnetically Controled Growth Rods
Mustafa Celiktas, Levent Sener, Mahir Gulsen

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13:30-14:30 SPİNAL İMPLANT, İMPLANTASYON, SAKRUM SORUNLARI ve OMURGA CERRAHİSİNDE HUKUK
Oturum Başkanları: Uygur Er, Nurullah Ermiş

13:30-13:40	İmplant yetmezliği nedenleri ve çözümleri	*Engin Çetin*
13:40-13:50	Komşu segment hastalığı risk faktörleri ve önlenmesi	*Hakan Emmez*
13:50-14:00	Sakral perinöral kistlerde yönetim	*Şeref Doğan*
14:00-14:10	Tartışma	
14:10-14:25	Omurga cerrahisinde hukuk	*Erdal Kalkan*
14:25-14:30	Tartışma	

14:30-15:30 DEFORMİTE
Oturum Başkanları: Yetkin Söyüncü, Halil İbrahim Süner

14:30-14:42	Omurga hiperkifozunun tedavisi: Korse ne zaman? Ameliyat ne zaman?	*Yashar R. Jalilov*
14:42-14:54	Kazanılmış kifoz (iyatrojenik)	*Nurullah Ermiş*
14:54-15:06	Omurga tüberkülozuna bağlı kifotik deformitede yönetim	*H. İbrahim Seçer*
15:06-15:18	Erişkin spinal deformitede çok düzeyli ALIF/PLIF/TLIF uygulamaları	*Çağatay Öztürk*
15:18-15:30	Tartışma	

15:30-16:00 Kahve Molası

16:00-17:00 PEDİYATRİK YAŞ GRUBUNDA CERRAHİ
Oturum Başkanları: Cenk Özkan, Ahmet Gürhan Gürçay

16:00-16:12	Asemptomatik gergin omurilik sendromuna eşlik eden skolyozda cerrahi strateji	*Suat Erol Çelik*
16:12-16:24	Meningomiyeloselli yeni doğanlarda kifektomi	*Nail Özdemir*
16:24-16:36	Pediyatrik yaş grubunda entrümantasyon ve füzyon	*Gökhan Demirkıran*
16:36-16:48	Pediyatrik yaş grubunda travma yönetimi	*Abtullah Milcan*
16:48:17:00	Tartışma	

17:00-18:00 SPİNAL ENJEKSİYONLAR, CHARCOT OMURGASI, KOKSİDİNİA
Oturum Başkanları: Onur Ulu, Abtullah Milcan

17:00-17:12	Radiküler ağrıda spinal enjeksiyonlar	*Mesut Bakır*
17:12-17:24	Spinal kökenli ağrılarda girişimsel tedavi yöntemleri	*Ahmet Yılmaz*
17:24-17:36	Charcot omurgası nedir?	*Nusret Ök*
17:36-17:48	Koksidinia yönetimi	*Erkin Sönmez*
17:48-18:00	Tartışma	

Yılın Bildirileri

Yılın Bildirileri

NP-01

THORACOSCOPIC VERTEBRAL BODY TETHERING FOR ADOLESCENT IDIOPATHIC SCOLIOSIS: CLINICAL JUDGMENT OF INITIAL CORRECTION NEED AND FOLLOW-UP CURVE BEHAVIOR ACCORDING TO SANDERS SKELETAL MATURITY STAGING SYSTEM

Ahmet Alanay[1], Altug Yucekul[2], Kadir Abul[3], Gokhan Ergene[4], Sahin Senay[5], Binnaz Ay[6], Barbaros Omer Cebeci[7], Murat Pekmezci[8], Suna Lahut[2], Yasemin Yavuz[9], Caglar Yilgor[1]
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PURPOSE: VBT is a growth modulation technique that allows gradual spontaneous follow-up curve correction as the patient grows. There is a lack of evidence regarding appropriate patient selection and timing of implantation. Hypothesis was that initial curve correction need and follow-up curve behavior for VBT can clinically be judged preoperatively.

MATERIAL-METHODS: For Sanders 1, 2, 3, 4-5 and 6-7 groups, data were collected preoperatively, before discharge, and at each follow-up. Demographic, perioperative, clinical, radiographic and complication data were compared using Fisher-Freeman-Halton tests for categorical and Kruskal Wallis tests for the continuous variables. Pulmonary function test and SRS-22r questionnaire results were compared using Wilcoxon signed ranks test.

RESULTS: 25 Lenke 1 patients (23F, 2M, 12.3±1.2 years) with a mean follow-up of 22.1 (12-54) months were included. The mean preoperative main thoracic curve was 46.4°±7°. For all curves, preoperative and first erect curve magnitudes, bending flexibility and operative correction percentages were similar between groups ($p>0.05$). The median height gained during the course of the f-up was different between groups ($p<0.001$), which was reflected into median f-up curve correction rates. The mean preoperative forced vital capacity significantly increased at 1 year f-up ($p<0.000$). 3 (12%) patients had pulmonary and 6 (24%) had mechanical complications. 1 (4%) patient required readmission and 2 (8%) required reoperation. Occurrence of pulmonary complications was similar in Sanders groups ($p=0.804$), while mechanical complications were significantly higher in Sanders 2 patients ($p=0.022$).

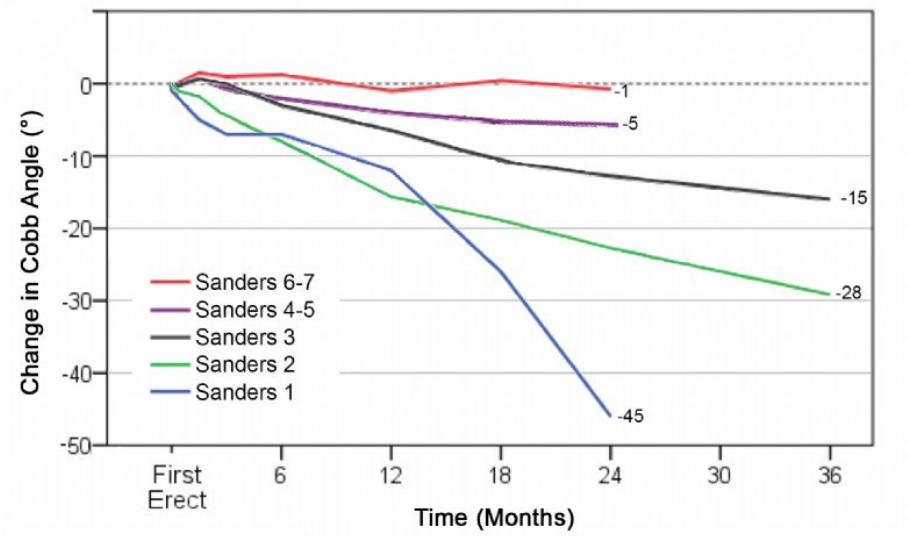
CONCLUSIONS: This study points out the differences in outcomes after thoracoscopic anterior vertebral body tethering (VBT) for patients with different Sanders skeletal maturity staging groups. Anticipating the findings of UIV-LIV follow-up vertical height gain and follow-up curve correction rates together with the patient's Sanders stage, the authors recommend a patient selection and surgical planning scheme. Clinical judgment of surgical correction need and estimation of follow-up curve behavior after thoracoscopic VBT can be done using Sanders staging. Sanders ≤2 patients are candidates for overcorrection, thus surgery should be delayed if possible.

Yılın Bildirileri

Sanders 3-5 patients possess a lesser risk of mechanical complications. VBT resulted in improved pulmonary functions and patients reported outcomes.

Keywords: VBT, AIS, sanders

Sanders-VBT



Yılın Bildirileri

NP-02

ANY VERTEBRAL SEGMENT MAY BE CHOSEN AS UPPER-INSTRUMENTED VERTEBRA IF IDEAL INDIVIDUALIZED SAGITTAL SHAPE AND ALIGHMENT IS REACHED

Caglar Yilgor[1], Suna Lahut[2], Yasemin Yavuz[3], Kadir Abul[11], Altug Yucekul[2], Peri Kindan[10], Ercan Yurttaser[10], Javier Pizones[4], Ibrahim Obeid[5], Frank Kleinstueck[6], Fransisco Javier Sanchez Perez Grueso[4], Emre Acaroglu[7], Ferran Pellise[8], Ahmet Alanay[1], Essg European Spine Study Group[9]
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PURPOSE: PJK/PJF incidence has been reported to decrease as UIV gets higher, due to reduction of stressors at the proximal junctional segments. Thus, selecting a higher UIV and avoiding to stop at TL junction and kyphotic apex was recommended. However, the role of proper sagittal plane reconstruction for different UIV levels in avoiding PJK/PJF has not been well investigated. The aim was to compare PJK/PJF rates of different anatomic UIV locations in patients that reached different postoperative sagittal shape and alignment.

MATERIAL-METHODS: Inclusion criteria: ≥4 levels fusion, and ≥2y follow-up. PJK was defined as UIV and UIV+2 angle ≥20° and to have ≥10° increase between early postoperative and follow-up radiographs. PJF was defined as fracture of UIV or UIV+1, hook dislodgement, pullout or cutout of instrumentation at UIV, and/or sagittal subluxation. UIV location was divided into 5 anatomic regions: L2-L3, T10-L1, T6-T9, T4-5 and T2-3. The Global Alignment and Proportion (GAP) score was used to postoperatively divide patients into 3 sagittal shape and alignment groups: Proportioned (GAP-P), Moderately Disproportioned (GAP-MD) and Severely Disproportioned (GAP-SD). PJK/PJF rates were compared using Chi-squared tests.

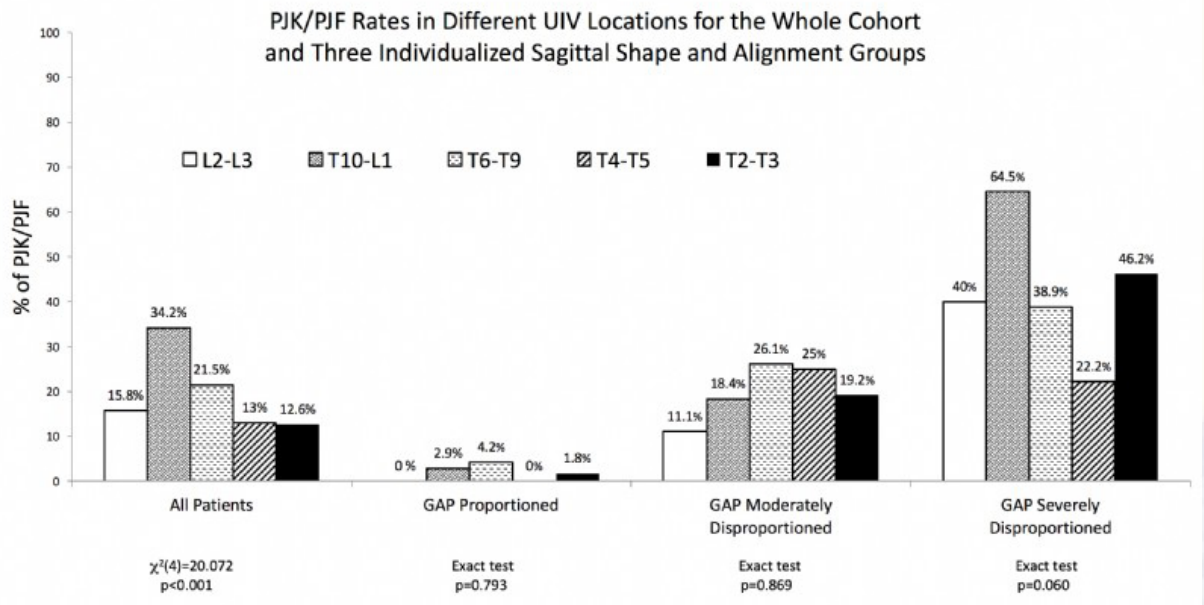
RESULTS: 379 patients (303F, 77M) were included. Mean age: 53.1±19.3(18-84) years. Mean follow-up: 32.0±10.2(24-65) months. 150 patients were GAP-P, while 128 and 108 were GAP-MD and –SD, respectively. For the whole cohort, PJK/PJF rates differed in UIV categories, TL junction having the highest, and Upper Thoracic having the lowest rates ($p<0.001$). When each GAP group was analyzed, PJK/PJF rates were similar in all UIV categories ($p=0.793$, $p=0.869$, and $p=0.060$, respectively). PJK/PJF rates were lower in GAP-P groups ($p<0.01$) (Fig 1).

CONCLUSIONS: None of the UIV locations are immune to PJK/PJF. However, in case of proper sagittal plane reconstruction to the individualized ideal shape and alignment, all anatomic UIV levels are less prone to PJK/PJF.

Keywords: Sagittal Plane, Adult Spinal Deformity, Proximal Junctional Segments

Yılın Bildirileri

PJK-UIV



Yılın Bildirileri

NP-03

"RECONSTRUCTION OF THE BASEMENT" RATHER THAN "ADDING A STORY" IS MORE EFFECTIVE IN PREVENTING RE-PJK IN ADULT SPINAL DEFORMITY PATIENTS

Caglar Yilgor[1], Suna Lahut[2], Yasemin Yavuz[3], Kadir Abul[11], Altug Yucekul[2], Fırat Gulagacı[10], Omer Orhun[10], Louis Boissiere[5], Ibrahim Obeid[5], Frank Kleinstueck[6], Fransisco Javier Sanchez Perez Grueso[4], Emre Acaroglu[7], Ferran Pellise[8], Ahmet Alanay[1], Essg European Spine Study Group[9]
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PURPOSE: Extension of fusion to upper segments is the mainstay of symptomatic PJK/PJF revision surgery. Although this procedure stands effective due to the reduction of stressors at the proximal junctional segments, it frequently results in re-PJK. A reason for this may be the ongoing spinopelvic misshape and malalignment. The aim was to compare the effects of two different surgical strategies (Spinopelvic realignment and extension of fusion (REALIGN) vs extension of fusion only (EXT)) on re-PJK rates.

MATERIAL-METHODS: Inclusion criteria: ≥4 levels fusion, ≥2y follow-up and having revision surgery due to symptomatic PJK/PJF. Re-PJK/PJF was defined as UIV-UIV+2 angle ≥20° and ≥10° increase between early postop and follow-up radiographs and/or fracture of UIV/UIV+1 and implant complications at UIV. The Global Alignment and Proportion (GAP) score was used to postoperatively divide patients into 3 groups: Proportioned (GAP-P), Moderately Disproportioned (GAP-MD) and Severely Disproportioned (GAP-SD), indicating individualized sagittal shape and alignment. Re-PJK rates were compared using Chi-squared tests.

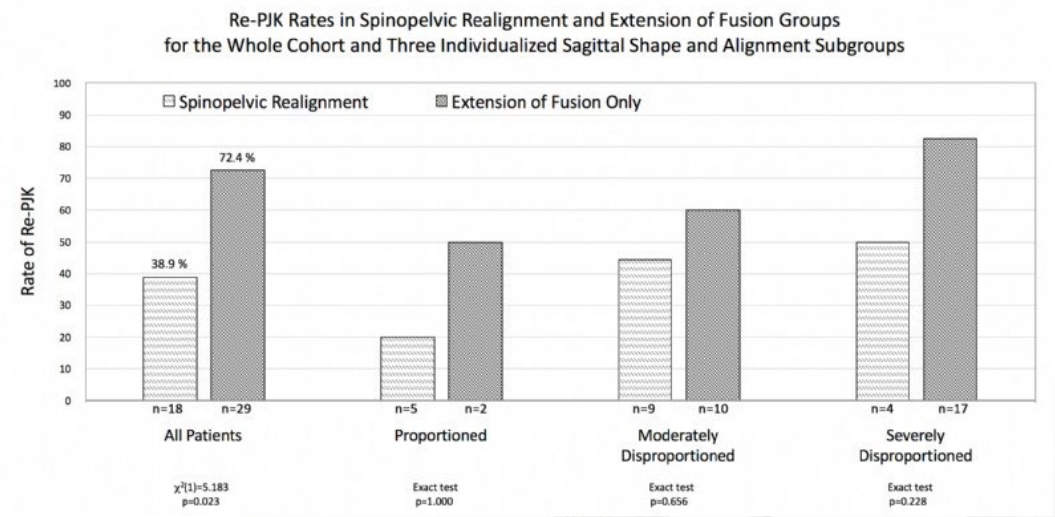
RESULTS: 47 patients (36F, 11M) were included. Mean age: 66.9±11(23-81) years. Mean follow-up: 31±10.8(24-62) months. 29 had EXT and 18 had REALIGN surgery. Groups were similar according to age, BMI and gender (p>0.05). Overall, 28 (59.6%) had re-PJK. Re-PJK rates were different in treatment groups (p=0.023). In EXT, mean pre- and post-op GAP was 8 and 7, respectively. 72.4% of the patients had re-PJK. In REALIGN, mean pre- and post-op GAP was 10.7 and 4.5, respectively. 38.9% of the patients had re-PJK. Details are given in Fig 1.

CONCLUSIONS: Re-PJK occurred in more than half of the patients that had undergone PJK revision surgery. Re-PJK rates can significantly be reduced via performing spinopelvic realignment surgery in addition to extension of fusion. Lowest re-PJK rates were observed in patients that reached ideal individualized sagittal shape and alignment.

Anahtar Kelimeler: Sagittal Plane, Adult Spinal Deformity, PJK Revision Surgery

Yılın Bildirileri

Re-PJK



Yılın Bildirileri

NP-04

CLINICAL, RADIOLOGICAL AND HRQOL OUTCOMES AFTER SELECTIVE THORACIC FUSION WITH MINIMUM 15 YEARS FOLLOW-UP

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INTRODUCTION: The purpose of this study was to evaluate the minimum 15 year natural history of uninstrumented compensatory lumbar curves in patients who underwent posterior selective thoracic fusion, and measure the HRQoL scores beyond 15 years after surgery, while comparing them with an age, gender, and BMI matched population.

METHODS: Group A included 43 female AIS patients whom underwent selective thoracic fusion (STF) with mean age 33 (27-42) years, and a mean of follow-up of 18.7 (15-28) years, and mean BMI 22 (18-29). Preoperative, early postoperative, and follow-up x-rays were reviewed for the natural behavior of lumbar curves. Group B included randomly selected 43 female individuals with mean age 33 (27-41), and mean BMI 22 (17-33).The exclusion criteria for control group was knowledge of spinal deformity or spinal intervention. HRQoL scores (SRS-22, ODI, VAS) were compared between the two groups in latest f/up. The disc height, osteophyte formation, rotatory subluxation, and lateral spondylolisthesis were evaluated by using the latest x-rays between groups. Mann whitney-u test was used for the statistical assessment.

RESULTS: A posterior fusion was performed in all 43, with all pedicle screws used in 41 and all-hook constructs in 2 with fusion to T11 (4), T12 (25), or L1 (14). Main TH curve correction improved from pre-op to early post op and maintained at latest f/up (55,6°-16,1°-16,9°). Spontaneous lumbar curve correction was also maintained beyond 15 years (39,9°-16,6°-17,1°) Two pts (4,6%) with decompensation in early postop period improved and became compensated in latest f/up. No revisions or other spinal interventions were performed to Group A. Mean HRQoL scores, self image, and mental health scores were higher in group A than group B ($p<0.05$). SRS-22r pain, function, ODI and VAS scores, marital status, number of children were similar between the groups ($p>0,05$). All disc heights except (T11-T12 and L5-S1) were significantly lower in group A ($p< 0,05$). There was no significant difference between the groups in terms of osteophyte formation, rotatory subluxation, and lateral spondylolisthesis in the latest x-rays.

CONCLUSION: Despite disc height narrowing, uninstrumented lumbar curve in selective thoracic fusion maintains spontaneous curve correction and does not show any significant degenerative changes at an average 18 years. HRQoL scores suggested that the psychological and functional well-being were quite good in the long term in AIS patients who have undergone selective thoracic fusion when compared with an age – gender – BMI matched population.

Keywords: AIS, HRQOL, Selective Thoracic Fusion

Yılın Bildirileri

NP-05

ASSESSMENT OF SAGITTAL SHAPE AND ALIGNMENT USING SHORT-CASSETTE RADIOGRAPHS AND INTRAOPERATIVE FLUOROSCOPIC IMAGES FOR PREDICTING MECHANICAL COMPLICATIONS

Caglar Yilgor[1], Altug Yucekul[2], Ipek Ege Gurel[3], Umut Can Karaaslan[3], Tais Zulemyan[2], Yasemin Yavuz[4], Louis Boissiere[5], Ibrahim Obeid[5], Frank Kleinstueck[6], Francisco Javier Sanchez Perez Grueso[7], Emre Acaroglu[8], Ferran Pellise[9], Ahmet Alanay[1], Essg European Spine Study Group[10]
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PURPOSE: Individualized sagittal plane shape and alignment is described by the GAP Score via the PI-based proportional parameters of Relative Pelvic Version (RPV), Relative Lumbar Lordosis (RLL), Lordosis Distribution Index (LDI), and Relative Spinopelvic Alignment (RSA). The use of RSA requires long-cassette radiographs to be able to quantify global tilt. Intraoperatively, Sacral slope is a position-dependent parameter complicating the use of RPV. Aim was to compare predictive abilities of different GAP scores created by various combinations of its parameters.

MATERIAL-METHODS: GAP Score comprises: RPV + RLL + LDI + RSA + Age Factor. Lumbosacral GAP Score was defined as: RPV + RLL + LDI + Age Factor. Lumbar GAP Score was defined as: RLL + LDI + Age Factor. Mechanical complications were defined as PJK/PJF, DJK/DJF, rod breakages and implant-related complications. The ability of each score to predict mechanical complications and revisions were determined by plotting receiver operating characteristic (ROC) curves. The diagnostic performances were compared by the method defined by DeLong et al. using the area under the curve (AUC), sensitivity, specificity, positive predictive value and negative predictive value.

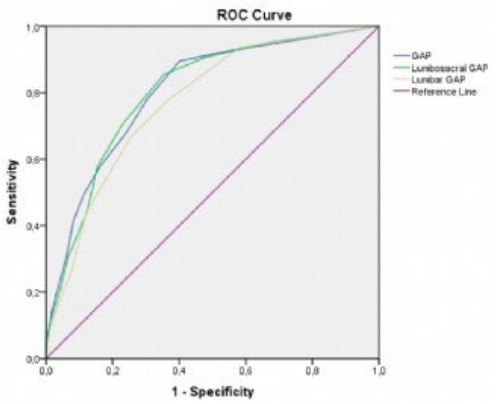
RESULTS: The data from 457 patients (362F, 95M, 53±19 yrs) with ≥4-level fusion and a mean follow-up of 39.3 (24-94) months were included. The GAP, Lumbosacral GAP and Lumbar GAP Scores were good predictors of mechanical complications with a cut-off of ≥3 for each. In predicting a mechanical complication, GAP and Lumbosacral GAP Scores were superior to Lumbar GAP Score. A similar trend was observed for the prediction of mechanical revisions.

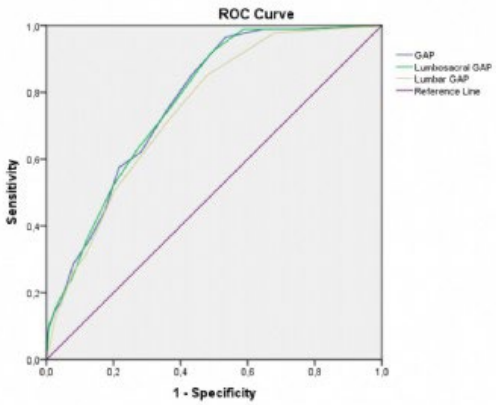
CONCLUSIONS: Although RPV and RSA are indispensable parts of the GAP concept and score in analyzing the individualized sagittal shape and alignment, the prediction ability of the score in the absence of these parameters are not affected. The GAP, Lumbosacral GAP and Lumbar GAP Scores were good predictors of mechanical complications with a cut-off of ≥3 for each. This information can be useful in every-day clinical practice and in operating room setting, in which SS and GT cannot reliable be measured. Lumbosacral radiographs and fluoroscopic lumbar images can be used for intraoperative decision making regarding the achievement or otherwise of the preoperative plan.

Keywords: sagittal plane, adult spinal deformity, prediction

Yılın Bildirileri

intraop GAP





Scores	AUC (SE)	p	95% CI	Cut-off	Sens	Spe	PPV	NPV
To Predict Mechanical Complication*								
GAP	0.805 (0.021)	<0.001	0.766 to 0.840	≥3	89.5%	59.9%	63.5%	88.0%
Lumbosacral GAP	0.804 (0.021)	<0.001	0.764 to 0.839	≥3	85.5%	64.6%	65.3%	85.1%
Lumbar GAP	0.772 (0.022)	<0.001	0.731 to 0.810	≥3	67.0%	74.3%	67.0%	74.3%
To Predict Mechanical Revision*								
GAP	0.773 (0.024)	<0.001	0.732 to 0.810	≥3	96.6%	46.5%	29.8%	98.3%
Lumbosacral GAP	0.773 (0.024)	<0.001	0.732 to 0.810	≥3	92.0%	50.8%	30.5%	96.4%
Lumbar GAP	0.747 (0.026)	<0.001	0.704 to 0.786	≥2	85.1%	52.2%	29.5%	93.7%

*GAP- Lumbosacral GAP; p=0.796, GAP- Lumbar GAP; p=0.003, Lumbosacral- Lumbar GAP; p<0.001
**GAP- Lumbosacral GAP; p=0.991, GAP- Lumbar GAP; p=0.072, Lumbosacral- Lumbar GAP; P=0.025

Yılın Bildirileri

NP-06

DOES CERVICAL INSTANTANEOUS CENTRE OF ROTATION CHANGE AFTER SCOLIOSIS SURGERY

Ali Asma, Haluk Berk
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Instantaneous Centre of Rotation (ICR) refers to a non-moving line with zero velocity around which a rigid body is moving in a particular plane and forming the centre of motion. It is known that ICR gives more accurate results in terms of the quality of the cervical vertebral motion when compared to ROM measurement, which shows great differences between observers.

HYPOTHESIS: The kinematics of cervical spine will change after thoracic instrumentation in Adolescent Idiopathic Scoliosis(AIS) patients and ICR as an indicator of this will change concomitantly postoperatively.

DESIGN: We designed this study to see the effects of thoracic instrumentation on the cervical kinematics. We enrolled AIS population and cervical trauma, congenital or neuromuscular scoliosis, previous spine surgery history, cervical fusion, and cases with poor cervical x-ray image were excluded.

METHODS: 25 AIS patients were included in this study. C4-C5 and C6-C7 segmental ICR were determined by overlapping technique that described previously in the literature on preoperative and postoperative cervical flexion-extension x-rays. Flexion and extension images were overlapped on licensed Adobe Photoshop CS 6(California, US, 2012) and ICR for each segment calculated on licensed AutoCad(California, US, 2007) software. In addition, cervical sagittal parameters such as C2- C7 Sagittal Vertical Axis (SVA), Upper Cervical Lordosis (UCL), Lower Cervical Lordosis (LCL), T1Slope(T1S), global sagittal parameters as SVA, T1 Pelvic Angle (T1PVA), pelvic parameters as Pelvic Incidence(PI), Sacral Slope (SS), Pelvic Tilt (PT), kyphosis parameters as T1-T5 and T5-T12 kyphosis were determined and preop postop values were compared. The presence of T2 instrumentation and the instrumentation under the L2 vertebra, choice of implant at the upper instrumentation and the type of curvature were also investigated.

RESULTS: There was no statistically significant change in C4-C5 and C6-C7 ICRs postoperatively. 20 of 25 patients in our sample revealed a decrease in postoperative T5-T12 kyphosis and this was statistically significant. Also, there were statistically significant increases in postoperative T1PVA, SVA and SS. T1S was correlated with ASL, T5-T12 kyphosis, SVA, and C2-C7 SVA.

CONCLUSION: It has been found that T1S play a key role for cervical, thoracic and global parameters. There was no relationship between the development of postoperative cervical kyphosis or lordosis and ICR which one represents the quality and quantity of intervertebral motion.

Take Home Message: If cervical kyphosis is seen in an AIS patient after thoracic instrumentation, It will be a false assessment to assume as a bad cervical kinematic postoperatively

Keywords: instantaneous center of rotation, adolescent idiopathic scoliosis, cervical alignment

Yılın Bildirileri

NP-07

VERTEBRAL BODY TETHERING VS POSTERIOR INSTRUMENTATION AND FUSION FOR ADOLESCENT IDIOPATHIC SCOLIOSIS: A MATCHED COHORT ANALYSIS

Altug Yucekul[1], Omer Orhun[2], Barkin Erdogan[2], Tais Zulemyan[1], Gokhan Ergene[3], Sahin Senay[4], Binnaz Ay[5], Yasemin Yavuz[6], Caglar Yilgor[7], Ahmet Alanay[7]
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PURPOSE: Clinical and radiographic results of fusionless treatment with VBT were compared with the results of PIF in an age, skeletal maturity and curve-type matched cohort.

MATERIAL-METHODS: Demographic, perioperative, clinical, radiographic, pulmonary function data and complications were recorded preoperatively and at 1 year postoperative follow-up. Demographic and preoperative radiographic data were compared using Exact, Student's t and Mann Whitney U tests. Results of two treatment methods were compared using Two-way mixed ANOVA.

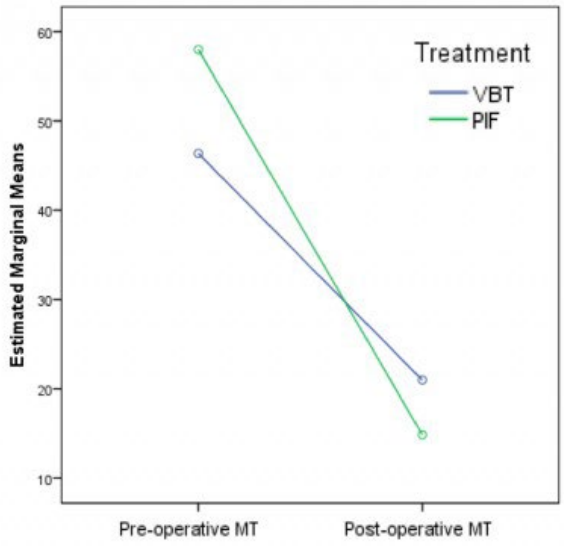
RESULTS: 14 VBT cases (13F, 1M, 13±0.8 years) with a mean follow-up of 22.1 (12-36) months were matched to 14 PIF cases (13F, 1M, 13.2±1.1 years) with a mean follow-up of 16.1 (12-21) months, according to age, skeletal maturity and curve-type. Preoperative height, weight, menarchal status, forced vital capacity (FVC) and FVC% were similar between groups (for all comparisons, $p>0.05$). Among all coronal (Upper thoracic (UT), main thoracic (MT) and lumbar (L)), sagittal and hump measurements, only MT curve was preoperatively different, PIF cases having slightly bigger curves (mean 47° (38°-55°) for VBT vs mean 54.5° (48°-80°) for PIF, $p<0.001$). A mean of 6.9 (5-8) thoracic levels were tethered and 7.6 (5-9) thoracic levels were fused. Comparing preoperative to last follow-up, significant changes were observed in all parameters for both groups. Changes in height (4.4 vs 3.5cm), UT curve (37% vs 60%), FVC (325 vs 419 ml) and FVC% (5% vs 6.4%) were similar in VBT and PIF groups ($p>0.05$). Decrease in MT curve (54% vs 74%), hump (42% vs 77%), and restoration of kyphosis (-4% vs 22%) were different in VBT and PIF groups, respectively ($p<0.001$, $p<0.001$ and $p=0.027$). One (7%) VBT case had a pleural effusion that required readmission. One (7%) PIF case had a hematoma that required surgical washout.

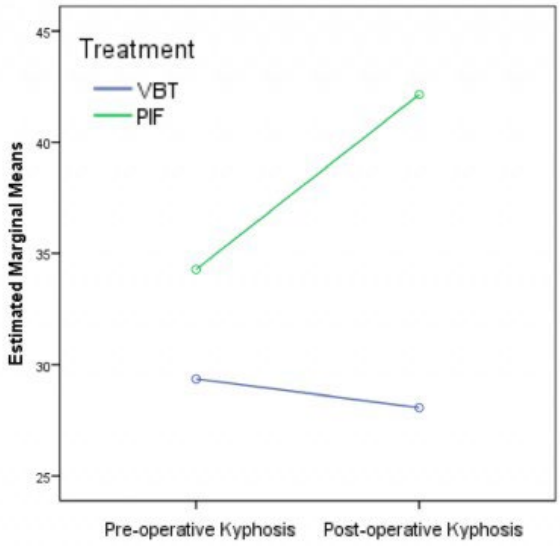
CONCLUSIONS: PIF resulted in better main thoracic curve correction, hump reduction and kyphosis restoration compared to VBT. Clinical results and complications were comparable at 1 year postoperative follow-up, with significantly improved pulmonary functions in both groups. Longer follow-up will demonstrate long-term differences in outcomes.

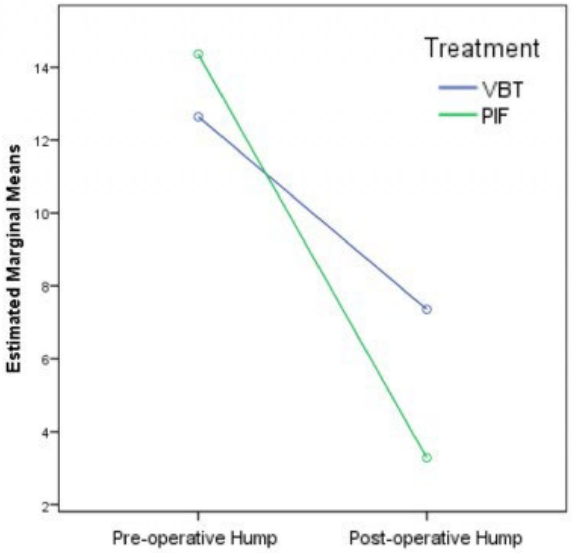
Keywords: VBT, PIF, AIS

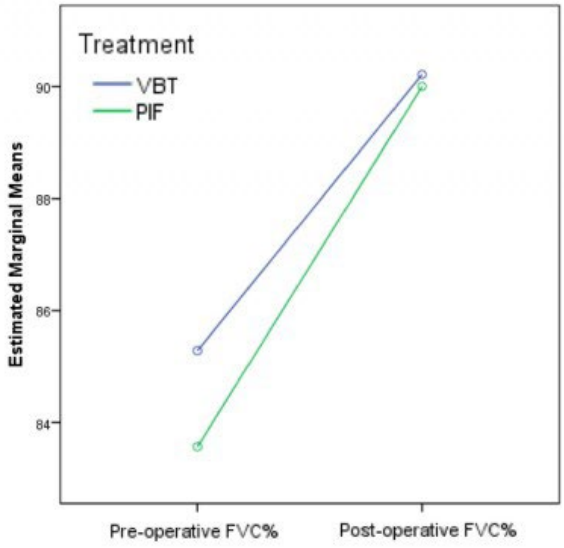
Yılın Bildirileri

VBT-PIF









Yılın Bildirileri

NP-08

EFFECT OF MESENCHYMAL STEM CELL AND ERYTHROPOIETIN COMBINATION IN A RAT SPINAL FUSION MODEL

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INTRODUCTION: In this study, we investigated the efficacy of EPO and MSC combination at a rat posterolateral spinal fusion model.

MATERIAL-METHODS: 77 female Sprague-Dawley rats were used for this study. Study groups were briefly designed as “EPO”, “MSC”, “EPO+MSC” and “control” groups. “EPO+MSC” groups are further divided into “preoperative 24 hour” and “postoperative 72 hour” groups regarding the starting time of EPO administration to assess the possible anti-inflammatory effects on fusion. A total of 11 sub-groups are presented at Table 1. All groups underwent L4-L5 posterolateral spinal fusion surgery, except the negative control group. Plain radiographs and MDCT scans are performed for all rats at the preoperative day and at the 3rd and 6th weeks. For MDCT scans a 320-Detector Row CT system was used. Using Mimics Innovation Suite, 3D models of L3-L6 segment was reconstructed. Volume analysis and volumetric changes in 0-3,3-6 week periods were calculated. Manuel palpation assessment and histopathological analyses were performed after sacrification and dissection of L3-L6 segment to assess fusion at 3rd and 6th weeks.

RESULTS: Radiography: “EPO+MSC” groups had higher fusion rates compared to other groups at 3rd and 6th weeks (p=0,000 and 0,010).

MDCT: “EPO” groups had no statistical difference (NSD) compared to other groups. “MSC” groups had higher volumetric increase compared to “control” and “EPO” groups; “EPO+MSC” groups had higher volumetric increase compared to “MSC” and “EPO” groups; MSC+post72hEPO groups had higher volumetric increase compared to MSC+pre24hEPO groups (NSD).

MANUAL PALPATION: “EPO” groups had lower fusion rates compared to “control” and “MSC” groups (NSD). “MSC” groups had statistically higher fusion rates compared to “control” and “EPO” groups (p=0,015). “EPO+MSC” groups had statistically higher fusion rates compared to “control” and “EPO” groups (p=0,015), but had no difference compared to “MSC” groups. There were NSD between “pre24h” and “post72h” groups.

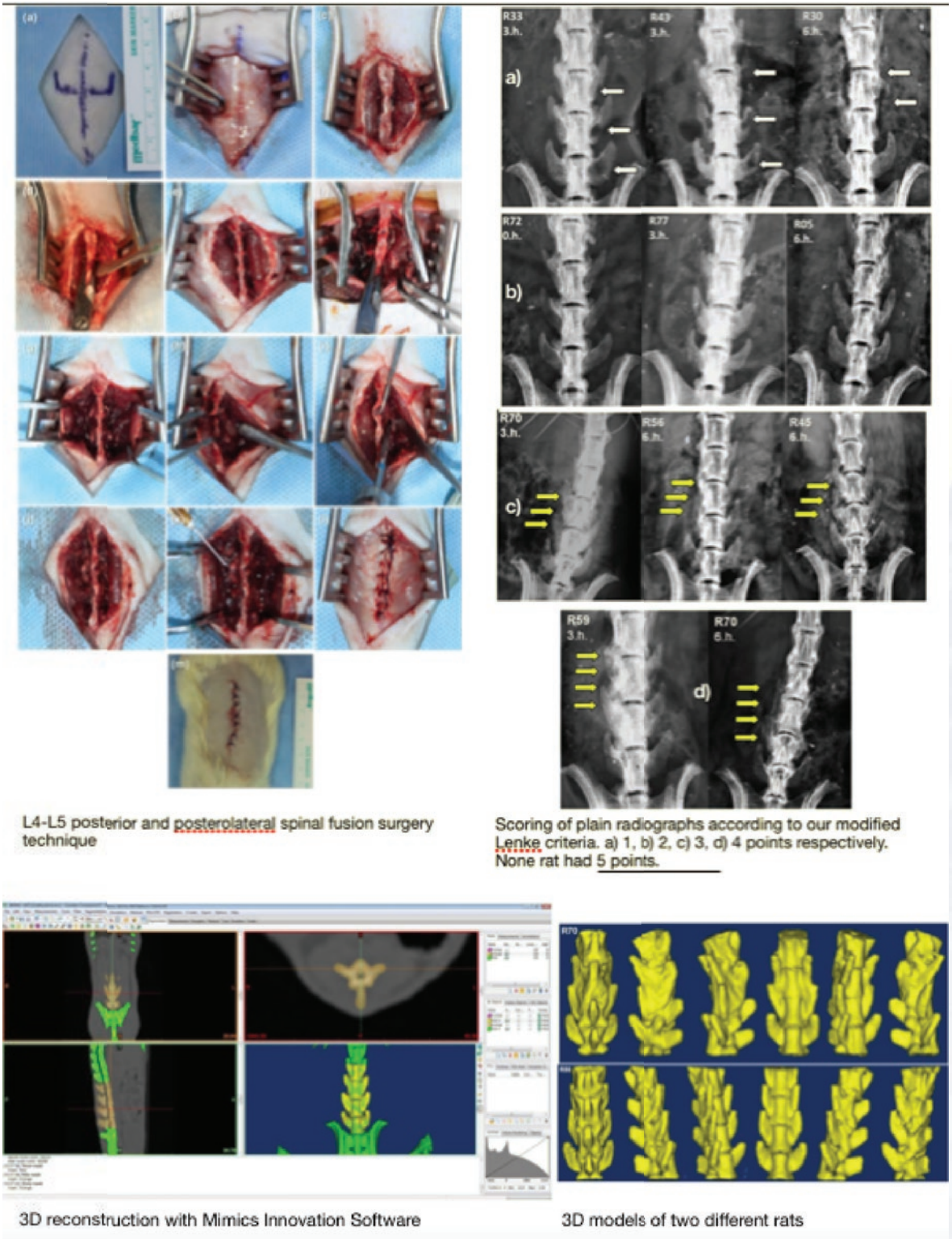
HISTOPATHOLOGY: “EPO” groups had lower fusion rates compared to “control” and “MSC” groups (NSD). “MSC” groups had statistically higher fusion rates compared to “control” and “EPO” groups(p=0,015). “EPO+MSC” groups had statistically higher fusion rates compared to “control”, “MSC” and “EPO” groups (p= 0.000). There were NSD between “pre24h” and “post72h” groups.

CONCLUSION: Our data suggest that “only EPO” administration doesn’t statistically affect fusion rates. On the other hand, application of MSCs increases fusion rates compared to control and EPO groups. Furthermore, combination of EPO and MSCs further increases fusion rates compared to “control”, “EPO” and “MSC” groups.

Keywords: Sprague-Dawley rat, spinal fusion, erythropoietin, mesenchymal stem cell, MDCT, Mimics Innovation Suite

Yılın Bildirileri

Figure 1



L4-L5 posterior and posterolateral spinal fusion surgery technique

Scoring of plain radiographs according to our modified Lenke criteria. a) 1, b) 2, c) 3, d) 4 points respectively. None rat had 5 points.

3D reconstruction with Mimics Innovation Software

3D models of two different rats

Surgical technique, scoring of plain radiographs, 3D reconstruction using Mimics Innovation Software and 3D models of two different rats are shown in the figure.

Study Groups

Group	Description	n
Group 1 Negative Control (NC)	None medical or surgical intervention	7
Group 2 Positive Control (PC_3w)	Surgery (L4-L5 posterolateral spinal fusion) – Daily intraperitoneal (IP) saline (0.9% NaCl) administration (equal to the volume of 500 IU/kg EPO dosage) - Sacrification at 3rd week	7
Group 3 Positive Control (PC_6w)	Surgery - Daily IP saline administration - Sacrification at 6th week	7
Group 4 (EPO_3w)	Daily IP EPO administration (500 IU/kg) starting 24 hours prior to surgery - Surgery - Sacrification at 3rd week	7
Group 5 (EPO_6w)	Daily IP EPO administration starting 24 hours prior to surgery - Surgery - Sacrification at 6th week	7
Group 6 (MSC_3w)	Surgery - MSC application (local application at decortication site, without osteoblastic differentiation and scaffold usage, approximately 1 million cells) – IP saline administration - Sacrification at 3rd week	7
Group 7 (MSC_6w)	Surgery - MSC application - IP saline administration - Sacrification at 6th week	7
Group 8 (pre24hEPO+MSC_3w)	Daily IP EPO administration starting 24 hours prior to surgery - Surgery - MSC application - Sacrification at 3rd week	7
Group 9 (pre24hEPO+MSC_6w)	Daily IP EPO administration starting 24 hours prior to surgery - Surgery - MSC application - Sacrification at 6th week	7
Group 10 (post72hEPO+MSC_3w)	Surgery - MSC application - Daily IP EPO administration starting 72 hours after surgery - Sacrification at 3rd week	7
Group 11 (post72hEPO+MSC_6w)	Surgery - MSC application - Daily IP EPO administration starting 72 hours after surgery - Sacrification at 6th week	

Sözlü Bildiriler

Sözlü Bildiriler

OP-01

PREVALENCE OF THORACIC SCOLIOSIS IN ADOLESCENTS: ANALYSIS OF 1065 CHEST RADIOGRAPHS WITH A COMPREHENSIVE REVIEW OF ADOLESCENT SCOLIOSIS PREVALENCE IN THE WORLD

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OBJECTIVES: School scoliosis screening programs (SSSPs) are widely used for reporting the prevalence and improving the awareness of scoliosis. Thus, scoliosis could be prevented and/or timely treated. However, small-degree scoliosis (10-20 degrees) could be missed in SSSPs. Previously obtained plain chest radiographs could be used adjunct to SSSPs to detect the exact prevalence of scoliosis. In this study, we aimed to analyze prevalence of thoracic scoliosis in adolescents using posterior-anterior chest radiographs. We also aimed to compare the results with SSSPs done worldwide.

METHODS: Cross-sectional radiological study using plain chest radiographs obtained in a community-based hospital and systematic literature review of articles about SSSPs retrieved from Pubmed/MEDLINE search engine. Patients born in 2001 and already had fully standing postero-anterior plain chest radiographs, obtained for reasons other than spinal conditions or trauma were enrolled in this study. Demographic variables were drafted along with radiographs using the picture archiving and communication system of the hospital. Thoracic spine coronal Cobb angles were measured using Surgimap. Scoliosis was defined as coronal plane Cobb angle equal to or more than 10 degrees.

RESULTS: One thousand and sixty five adolescents (519 females, 546 males) admitted to the hospital (mean age: 14,95±1,14 years; mean coronal Cobb angle was 4,40±4,03 degrees) were included into the study. Thoracic scoliosis was detected on plain posterior-anterior chest radiographs in 10,4% of the adolescents (64 female, 47 male; 95% CI 8,6-12,4%). The prevalence of thoracic scoliosis was significantly higher in females than males (12,3%; 95% CI 9,6-15,4% vs. 8,6%; 95% CI 6,2-11,0%; p=0,047). One hundred and seven papers about scoliosis screening in adolescents were retrieved from the literature. Each continent had different scoliosis prevalence as follows; 0.06-22.7% (Asia), 0.2-6.4% (Europe), 0.4-4.5% (North America), 1.4-1.5% (South America), 1.8-1.94% (Australia).

CONCLUSION: The SSSPs are useful to understand prevalence of scoliosis, and the factors associated with scoliosis in adolescents. Patients with small-angle curves could be missed in SSSPs. Our results showed that plain posterior-anterior chest radiographs could be used adjunct to SSSPs to detect more accurate prevalence of scoliosis in adolescents in a cost- and time-effective way.

Keywords: thoracic scoliosis, chest radiograph, screening, adolescent, prevalence

Sözlü Bildiriler

OP-02

THORACOSCOPIC VERTEBRAL BODY TETHERING FOR ADOLESCENT IDIOPATHIC SCOLIOSIS: MID-TERM RESULTS OF 24 PATIENTS

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[4]University of Health Sciences, Faculty of Medicine, Bakirkoy Training and Research Hospital, Deptartment of Neurosurgery, Spine Center
[5]Umraniye Training and Research Hospital, Spine Center, Istanbul,Turkey
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INTRODUCTION: Growth friendly surgical options by modulating the spinal growth and preventing the possible complications of fusion are new trends for the management of adolescent idiopathic scoliosis (AIS) in skeletally immature patients. Vertebral body tethering (VBT) as a fusionless minimally invasive treatment option has been shown to be effective to induce and also correct the scoliotic deformity by many animal studies. However only a few studies exist in the literature with regard to the clinical and functional early results of VBT. The aim of this study is to present the 2-years results of VBT applied to 24 skeletally immature patients with AIS.

PATIENTS AND METHODS: 24 patients with a diagnosis of AIS were included in the study prospectively after evaluation of their clinical and radiographic data.All patients were skeletally immature and followed up within a brace for at least 6 weeks.A decision to proceed with surgery was established after the detection of curve progression within the brace (>40°) with a minimum curve flexibility of 30%.

RESULTS: 18 females and 6 males had a mean age of 11.4, mean-follow up period of 2 years. Patients had a mean pre-operative major curve magnitude of 48° and a mean curve flexibility of 48.2%. An average of 8 levels of tethering was performed through thoracoscopic approach. Thoracic screws were placed thoracoscopically, while mini-lumbotomy was added in thoracolumbar levels. Tethering cord was advanced transdiaphragmatically and tensioned appropriately. 21 patients underwent unilateral instrumentation, while 3 patients with double curves underwent bilateral tethering from the convex side of both double curves. Post-operatively, a mean first erect major curve magnitude of 16° was acquired, while the mean major curve magnitude at the last follow-up was detected as 10°. One patient was diagnosed chylothorax immediate post-operatively and treated conservatively, while no other major complications were acquired. A TLSO brace was used for six weeks post-operatively to achieve union at the screw bone interface.

DISCUSSION AND CONCLUSION: Anterior VBT as a growth modulating treatment option by allowing the correction of the scoliotic deformity and restoring the coronal balance without the disruption of sagittal balance is a safe and effective option for the surgical treatment of AIS in skeletally immature patients. VBT also allows the preservation of motion of spinal segments yielding to return sports at the same pre-operative level. It has been shown that anterior VBT was able to yield excellent clinical and radiographic results without causing any major complications.

Keywords: Adolescent Idiopathic Scoliosis, Vertebral Body Tethering, Growth Modulation, Fusionless Treatment, Preservation of Motion, Protection of Adjacent Segments

Sözlü Bildiriler

OP-03

DISTAL JUNCTIONAL SAGITTAL PLANE ANALYSIS OF LENKE 3, 5 AND 6 AIS PATIENTS ACCORDING TO LOWEST INSTRUMENTED VERTEBRA SELECTION

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PURPOSE: Lowest instrumented vertebra (LIV) is selected mostly as lower end vertebra (LEV) or the vertebra one level above LEV (LEV-1), in Lenke type 3, 5 and 6 adolescent idiopathic scoliosis (AIS). Occasionally, in severe cases fusion can be extended to lower levels. This decision is mainly based on coronal and transverse plane parameters. Our aim in this study was to evaluate the effect of LIV selection on distal junctional region in sagittal plane.

METHODS: 83 patients with Lenke 3, 5 and 6 AIS that underwent all pedicle screw instrumentation and posterior fusion were retrospectively evaluated. Patients with more distal LIV levels were excluded. LIV level was decided intraoperatively according to the alignment of the disc below LIV. After wide facet resection and correction maneuvers including rod derotation, compression, distraction and in situ bending were performed. With this maneuvers LIV should become parallel or near-parallel to the vertebrae below. In 23 patients LIV was LEV-1, while 25 patients were fused to LEV. Two groups were analyzed according to distal junctional angle (DJA) and occurance of distal junctional kyphosis (DJK). DJA was measured between the superior endplate of LIV and the inferior endplate of the adjacent distal vertebra (Figure 1). DJA ≥10° was defined as DJK. If a disk distal to the instrumentation that was lordotic preoperatively became neutral or kyphotic postoperatively, it was also defined as DJK. Thoracic kyphosis (TK) and lumbar lordosis (LL) were also measured. Radiographs were taken preoperatively and at last follow-up. Clinical outcomes were assessed using SF-36 and SRS-22 questionnaires.

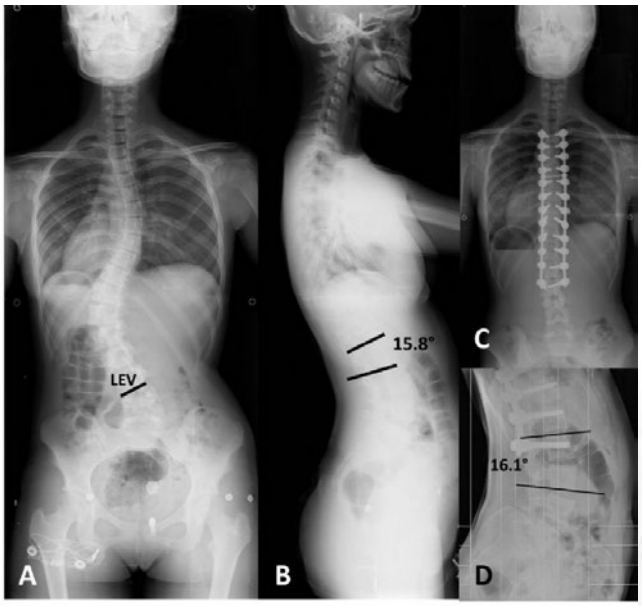
RESULTS: Mean age of the patients was 16.1 years (range 12-20). 65 patients were female and 18 were male. Mean follow-up period was 38 months (minimum 29 months). DJA did not change significantly at last follow-up for each group. Three patients in each group developed DJK, which were asymptomatic. Sagittal imbalance was not observed. No patient required revision surgery. Preoperative and postoperative TK and LL values were similar between groups (Table 1). There were no significant differences regarding postoperative clinical outcomes.

CONCLUSION: Selecting LIV as LEV or LEV-1 in Lenke 3, 5 and 6 AIS patients causes similar distal junctional alignment. Stopping the fusion at LEV-1, in order to save one more mobile segment does not seem to increase the risk of DJK. Deciding the LIV level according to coronal and transverse plane parameters is reasonable in Lenke 3, 5 and 6 AIS.

Keywords: Lowest instrumented vertebra, distal junctional kyphosis, Lenke type 3-5-6

Sözlü Bildiriler

Figure 1



Preoperative and postoperative DJA in patient with Lenke type 5 AIS.

Table 1

	LEV group	LEV group	LEV group	LEV-1 group	LEV-1 group	LEV-1 group
	Preop	Postop	p	Preop	Postop	p
DJA (°)	17.2±2.6	16.7±2.9	0.864	12.5±3.8	12.1±4.3	0.825
TK (T5-T12) (°)	25.8±7.4	25.1±8.2	0.796	24.2±6.9	23.8±8.1	0.814
LL (L1-L5) (°)	40.4±7.8	42.1±9.1	0.758	39.2±9.4	40.5±10.2	0.837

Preoperative and postoperative values.

Sözlü Bildiriler

OP-04

THE RESULTS OF PONTE OSTEOTOMY IN ADOLESCENT IDIOPATHIC SCIOLOSIS SURGERY

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Between January 2015 and December 2017 at Atatürk University Orthopedics and Traumatology Clinic, 23 patients underwent ponte osteotomy due to advanced grade rigid curvature (> 50 curvature, <45% flexibilty), from 74 patients who underwent a posterior instrumentation and fusion surgery after diagnosed as adolescent idiopathic scoliosis, were included in the study. Clinical and radiological records of these patients were obtained retrospectively from preoperative, postoperative, postoperative and policlinic controls.

Of the patients included in the study, 17 (74%) were female and 6 were male (26%). On the day of surgery, the patients' ages ranged from 11 to 35 years with an average age of 18.1 years. The follow-up period of the cases is between 14 months and 36 months and the average follow-up period is 22.1 months. In all cases, menarche has occurred in all of the female patients who have developed secondary sex characters. All of the cases were made by the same surgical team, the same company's entrapment systems and 5.5 mm titanium rod. None of the patients underwent anterior intervention and all cases were performed posteriorly.

According to preoperative measurements, the Cobb angle of the main thoracic spine was 70.90 (45-93), the Cobb angle of the thoracolumbar/lumbar spine was 520 (16-99), the flexibilty ratio of the fulcrum bending graphs was 36.8% in thoracal curves and 32.4% in thoracolumbar/lumbar respectively.

Coronal measurements performed after the mean of 3.1 (2-7) pontine osteotomies were applied to our patients; main thoracic Cobb angle, thoracic recovery rate, thoracic apical vertebral translation, thoracolumbar/lumbar (TL/L) Cobb angle, TL/L apical vertebral translation and TL/L recovery rate improved significantly ($p < 0.001$). Sagittal plan evaluations showed a change from 10.40 to 21.20 in hypokyphotic patients and from 33.40 to 33.40 in hyperkyphotic patients ($p < 0.05$). The results obtained in Cobb measurements from the lateral plate T5-T12 range and in normokyphotic patients are not significant. It has been determined that the average lumbar lordosis measured from the T12-S1 range is improved from -51.50 to -46.70 ($p<0.001$). Estimated blood loss was calculated as 1571 cc on average. Significant neuromonitor signal changes were detected in 3 patients and no neurological deficit was found in any of the patients in the postoperative period.

Keywords: Adolescent Idiopathic Sciolosis, Ponte Osteotomy, Smith-Petersen osteotomy

Sözlü Bildiriler

OP-05

THE EFFECT OF THE USAGE OF CELL-SAVER AND TRANEXAMIC ACID ON THE AMOUNT OF İNTRAOPERATIVE ALLOGENIC BLOOD TRANSFUSION WHILE MANAGING BLOOD LOSS IN ADOLESCENT İDIOPATHIC SCOLIOSIS SURGERY

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BACKGROUND DATA: Reconstructive adolescent idiopathic scoliosis surgery performed by applying pedicle screw system with posterior approach is a major surgical procedure. Allogenic blood transfusion is one of the oldest known method for volume loss during this surgery. In order to reduce the amount of intraoperative and postoperative blood transfusion, methods such as cell-saver (CS) and tranexamic acid (TXA) have been used. Our study was performed to assess the efficacy and safety of these two methods.

MATERIALS-METHODS: In our hospitals spine surgery clinic, between 2012 and 2018, a total of 58 patients whom met the inclusion criteria, were divided into 3 groups and these two methods (CS and TXA groups) were compared with the patients who underwent surgery without applying any blood loss reduction procedure. Group 1 consisted of patients whom we applied cell-saver only (n: 19), group 2 consisted of patients whom we applied tranexamic acid only (n: 19) and group 3 consisted of the patients whom had undergone surgery without applying any other blood loss reduction procedure (n: 20). Gender, age, screwing levels, how many units allogenic blood transfusion were performed except than autogenic blood transfusion by CS during the operation were respectively determined in all three groups. Also complications related to blood loss reduction procedures intraoperatively and postoperatively were evaluated.

RESULTS: When all 3 groups were considered together, the statistical difference was significant in terms of the amount of blood transfusion (p.0). While there was no significant difference in the amount of blood transfusion between group 1 and group 2 (p.4), there was significantly less amount of blood transfusion between group 1 & group 3 and between group 2 & group 3 (p.0 and p.0, respectively). None of the patients had major or minor complications related with managing blood loss.

CONCLUSIONS: The usage of cell-saver and/or tranexamic acid during reconstructive adolescent idiopathic scoliosis surgery significantly reduces the amount of intraoperative allogenic blood transfusion. Especially we think about that 10mg/kg bolus and 1mg/kg/ hour maintenance doses of tranexamic acid are effective and safe.

Keywords: Adolescent idiopathic scoliosis, Cell-saver, Tranexamic acid

Sözlü Bildiriler

OP-06

RESPIRATORY FUNCTION IN ADOLESCENTS: MILD IDIOPATHIC SCOLIOSIS PATIENTS AND HEALTHY INDIVIDUALS

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INTRODUCTION: Decreasing pulmonary function is major concern in progressive scoliosis. There were controversial studies about pulmonary function of Adolescent Idiopathic Scoliosis (AIS). It is reported that AIS patients are more inclined than healthy people in terms of respiratory compromised conditions.

OBJECTIVES: The main aim of this study is to determine the data of respiratory functions and to compare between patients with AIS and same aged healthy individuals. Furthermore; this study is first step of going on study which is aimed to detect the effect of conservative treatment on the respiratory function of AIS.

METHOD: Thirty five patients with AIS (35 female) and thirty five healthy adolescents (35 female), who are received as a control group, aged 10-17 were enrolled for this study. Cobb angle and curve pattern were evaluated for AIS group. Respiratory function have measured by using spirometer Contec SP10W for all volunteers. Forced vital capacity (FVC), forced expiratory volume in one second (FEV1) and peak expiratory flow (PEF) were evaluated in both groups. Statistical analysis was performed using the statistical package SPSS version 16. All data were assessed normal distribution using the Kolmogorov-Smirnov test. Descriptive statistics were used to represent the main values of evaluated variables. Between group comparison were conducted Mann Whitney U test. Pearson correlation was used to examine the relationship between respiratory outcome and Cobb angle.

RESULTS: The average age of patients with AIS was 12,9±1.8 (min 10,max 17) and for control group was 13.0±1,5 (min 10,max 17). In this study, there were 15 lumbar, 10 thoracic,10 thoracolumbar curve pattern. Mean values of Cobb angles in AIS groups are; 35,2º for major curve (min 22º,max 48º), 31,2° for thoracic (min 10°,max 45°), 33,1°for thoracolumbar (min 24°,max42° and 34° for lumbar curve (min20°,max48°). The mean value of FEV1 parameter of AIS group was 2,20 L(2,47 for control group), FVC parameter of AIS group was 2,34L (2,61 for control group), PEF parameter of AIS group was 4,48L (5,41 for control group). (Table 1)There were significant correlation between thoracic Cobb angle and PEF value in AIS group but there was no correlation FVC and FEV1 values.

CONCLUSIONS: There were significant differences in FVC, FEV1 and PEF values in between groups. All respiratory parameters were lower in AIS group than healthy volunteers. Lower FVC, FEV1 and PEF values could be result by the affected respiratory muscles that could be associated with obstructive pulmonary conditions.

Keywords: Scoliosis, spirometer, respiratory function, adolescent idiopathic scoliosis

	FVC	FEV1	PEF
Mann-Whitney U	395,50	345,00	279,00
Wilcoxon W	1025,50	975,00	909,00
Z	-2,549	-3,143	-3,918
Asymp. Sig (2-tailed)	,011	,002	,000

Table 1.

Respiratory Results Comparison between AIS and Control Group p≤0,05

OP-07

Sözlü Bildiriler

EVALUATION OF THE PARAMETERS AFFECTING RESPIRATORY FUNCTIONS AT ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS

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PURPOSE: The purpose of our study was to examine the relationship of spinal and nonspinal factors which affect pulmonary function in a group of adolescent idiopathic scoliotic subjects.

METHOD: The study included 29 patients with Lenke type 1 and type 2 adolescent idiopathic scoliosis who had a cobb angle of more than 30 degrees. We excluded patients who had any lung diseases or cognitive changes. Forced vital capacity (FVC), expiratory volume in the first second (FEV1) and FEV1/FVC were analyzed in absolute values and percentage of predicted values. FVC gave us an assessment of lung volume (restrictive diseases), while the FEV1 provides an assessment of flow function (obstruction)[1]. We obtained cobb angles, bending recovery rates, sagittal kyphosis angles, risser scores, apical vertebra rotation rates, and pulmonary function tests of patients. Cobb angle values measured on bending radiographs of the patients were recorded and than the bending recovery rates were determined. Apical vertebral rotations of patients were detected by using Drerup's AVR measurement method[2–3].

RESULTS: Six of the patients were male and 23 were female. The mean age of the patients was 14.2 (11-18) years. The mean cobb angle of the patients' main curvatures was 50.3 (32-84) degrees. The mean T4-T12 kyphosis angle of patients was 32.9 degrees (4-82). We found restrictive respiratory disorder at 18 (62.1%) patient and we found mild obstructive respiratory disorder at 1 (3.4%) patient. Test results was normal at the remaining 10 (%34.5) patients. Moderate restrictive lung disorder was found in 11 (61%) and mild restrictive lung disorder was found in 7 (39%) patients. No advanced pulmonary disfunction was detected. According to Pearson correlation analysis, there was a moderate positive correlation between T4-T12 kyphosis angle and FEV1. There was a moderate positive correlation between T4-T12 kyphosis angle and FVC. There was a moderate negative correlation between AVR and FEV1. There was a moderate negative correlation between AVR and FVC values also. We did not find any correlation between bending recovery rate, age, cobb angle, risser score and FEV1. We also did not find any correlation between bending improvement rate, age, cobb angle, risser score and FVC values.

CONCLUSION: In the literature, especially the relationship between many radiological parameters and pulmonary function tests were evaluated and different results were obtained. These studies generally show a positive correlation between apical vertebra rotation and thoracic hypokyphosis. At this point similar findings were obtained in our study.

Keywords: scoliosis, respiratory function, apical vertebral rotation, FEV1, FVC, kyphosis

Sözlü Bildiriler

OP-08

"A SUCCESSFUL SCOLIOSIS SCREENING PROGRAMME" IS IT POSSIBLE IN TURKEY?

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AIM: Scoliosis prevalence is 3%. For early diagnosis and treatment there are successful screening programs in developed countries. World Health Organization (WHO) reports the success threshold for screening programs to be at least 80% of the target population. The aim of this study is to define the pros and cons of a scoliosis screening program in Turkey

METHOD: One public school, one private school and a school that experienced a spot scoliosis screening program defined as target schools. In these schools, 1348 students between 10-14 ages defined as the target population. An informed consent form has been sent to these students and their parents for examination. Before the examination a briefing has been given to all students in the target population about spine and deformity. Students with 2 signed informed consent forms examined. During this examination; shoulder asymmetry, trunk shift evaluated and we performed Adam's forward bending test. Student's with abnormal findings send for orthopedic examination in the hospital after making an appointment. The data of this process analyzed to define the public behavior.

FINDINGS: 895 (66%) students took the short brifing from 1348 target population. 373 student (27%) with two signed informed consent form examined for scoliosis screening. 39 (10%) student with abnormal findings send for orthopedic evaluation. Only 13 (33%) students came for orthopedic evaluation and 4 of them defined as scoliosis and received the appropriate treatment.

RESULTS: Our screening program reached only 27% of the target population. This ratio is so far away from the ratio of a successful screening defined by WHO. The behavior of the Turkish public is not allowing to a successful screening program. And a successful screening program seems to be impossible if there will not be an effort to change this behavior.

Keywords: population, school, scoliosis, spine, screen, WHO

Sözlü Bildiriler

OP-09

THE EFFECTS OF BRACE TREATMENT ON SPINOPELVIC ALIGNMENT IN PATIENTS WITH ADOLESCENT HYPERKYPHOSIS

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INTRODUCTION: Hyperkyphosis (HK) is the structural curvature of the spine above the physiological limits. According to the treatment algorithms, specific exercises and brace treatment modalities are recommended for structural HK between 55-80° and skeletal immature adolescents. The aim of conservative treatment is to reduce HK, maintain global sagittal balance, prevent painful compensation mechanisms and improve quality of life.

OBJECTIVES: Recently, spinopelvic parameters based Global Alignment and Proportion (GAP) score is frequently used in preoperative surgical planning and for postoperative evaluation for sagittal pathologies. However, there is no study evaluating the effects of conservative treatment on Global GAP score in patients with HK. The aim of this study was to assess the effect of well design conservative treatment including a rigid brace and specific exercises on the hyperkyphosis, global sagittal balance and GAP score in patients with adolescent HK.

MATERIAL-METHODS: In a retrospective observational study, all the patients diagnosed with HK who were reviewed in 2015-2018, treated with CaD-CaM design rigid brace and with a specific exercise program for kyphosis at Formed Scoliosis & Brace Center. Multimodal hyperkyphosis specific exercise program was applied by a physiotherapist. Minimum follow-up time after brace usage was 1 year. Clinical parameters were identified and radiological measurements were assessed from sagittal radiological images at the beginning and after treatment. Kyphosis, L1-S1 and L4-S1 lordosis angles, pelvic incidence, sacral slope, global tilt and GAP score were measured from sagittal spine X-Rays as described in the literature. Statistically, all results were assessed and compared between pre-post treatment values.

RESULTS: 25 subjects, (14 male, 11 female) 14 of them had Scheuermann's HK, 11 of them had other causes. Mean age was 13,7 year, mean follow-up time was 15,6 months. Subjects used a specially designed rigid CaD-CaM brace and mean wearing duration was 14,4 hours/day. Specific HK exercises were applied for 88% of patients. Mean angle of kyphosis, lordosis, GAP score, pelvic incidence and sacral slope differences between before and after treatment are shown in Table 1. There were statistically significant improvements in kyphosis angle, lordosis, global tilt and GAP scores (Table 1).

CONCLUSION: Conservative treatment including brace and specific exercises controls pain, posture, spinopelvic parameters and reduces hyperkyphosis in individuals with good compliance. Well-designed conservative treatment should be included in treatment algorithms to protect global sagittal balance without developing pathological compensatory mechanisms. GAP score can also be used to evaluate conservative treatment effect in HK patients.

Keywords: hyperkyphosis, Global Alignment and Proportion, brace, spinopelvic

Sözlü Bildiriler

Table 1: Differences between before and after treatment on the outcome measurement

Variables	Before treatment Mean±SD (Min-Max)	After treatment Mean±SD (Min-Max)	P value (p≤0,05)
Kyphosis angle	58,4±7,1 (45,0-72,0)	50,3±9,2 (32,0-63,0)	0,000
Lordosis angle (L1-S1)	64,8±10,2 (42,0-83,0)	59,6±9,5 (37,0-78,0)	0,021
Lordosis angle (L4-S1)	38,6±7,0 (26,0-53,0)	35,9±6,7 (21,0-44,0)	0,148
Pelvic tilt	11,1±7,8 (3,0-24,0)	21,0±10,8 (1,8-21,0)	0,807
Pelvic incidence	41,3±9,2 (22,0-62,0)	41,5±10,1 (21,0-64,0)	0,753
Sacral slope	30,2±9,2 (11,0-52,0)	30,7±9,2 (5,0-47,0)	0,909
Global tilt	11,7±8,6 (1,0-30,0)	8,0±4,8 (0,2-19,0)	0,048
GAP score	3,5±2,0 (0,0-9,0)	1,6±1,9 (0,0-6,0)	0,003

Sözlü Bildiriler

OP-10

BRACED AND WEANED VS BRACED AND OPERATED ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS: A MATCHED COHORT ANALYSIS

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PURPOSE: Bracing is proven to be effective in treatment of immature AIS patients. Depending on various factors including design, compliance and initial curve location, magnitude and flexibility, braces may be used as a delaying tactic or as a definitive treatment option. The aim was to compare clinical and radiographic results of braced patients that were fully weaned versus that were operated.

MATERIAL-METHODS: Patients from 2 centers that were initially braced for at least 3 months; and had ≥1 year follow-up after either full brace weaning or surgery was included. Demographic, clinical, radiographic, and PROM data were recorded at initial visit, preoperatively and at 1 year post weaning or postoperative follow-up. Demographic and preoperative radiographic data were compared using Exact, Student's t and Mann Whitney U tests. Results of two treatment methods were compared using Two-way mixed ANOVA.

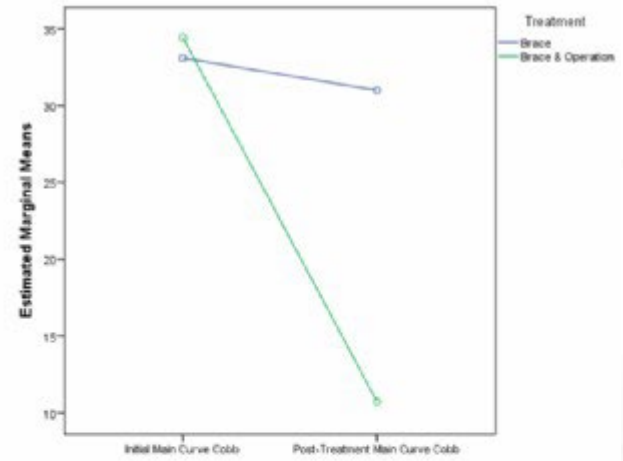
RESULTS: 31 braced and weaned cases (30F, 1M, 12.5±1.1 years) with a mean follow-up of 25 (12-48) months were matched to 27 braced and operated cases (26F, 1M, 11.9±1.5 years) with a mean follow-up of 18 (12-30) months. The mean main curve Cobb angles were similar (33.1° vs 34.4°) between groups (p=0.647). Median brace wear time for braced and weaned patients was 25 (9-46) months. In comparison, median brace wear time was 12 (3-36) months for braced and operated patients. Preoperative mean age and main curve Cobb angles were 13.3 (10-16)yrs and 57.4° (41°-84°). Changes in coronal measurements from initial visit to last follow-up were different between groups (p<0.001). All SRS22r subdomains and subtotal scores were similar between groups (p>0.05) except self-image scores that were lower at the time of operation and were higher in last follow-up (p=0.047).

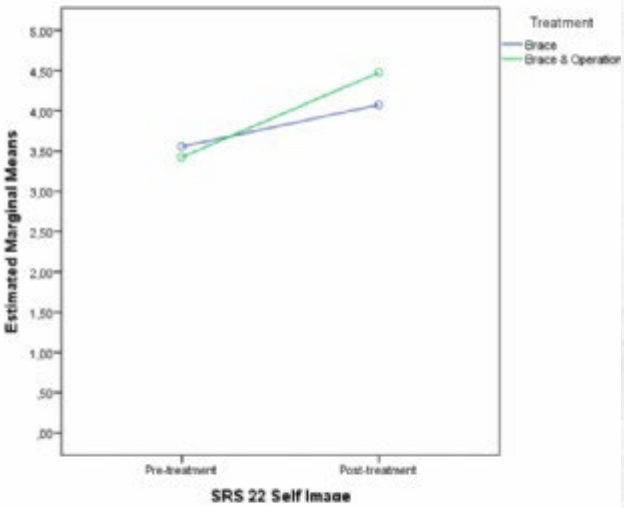
CONCLUSION: Operated patients had lower final main thoracic curve magnitudes compared to braced and weaned patients. Initial intention of time buying and/or issues of compliance might have resulted in operative decision in relevant cases. Although radiographic measurements of mobile spines with larger curves are different from fused and straight ones, clinical results were comparable at 1 year. Longer follow-up will demonstrate long-term differences in outcomes.

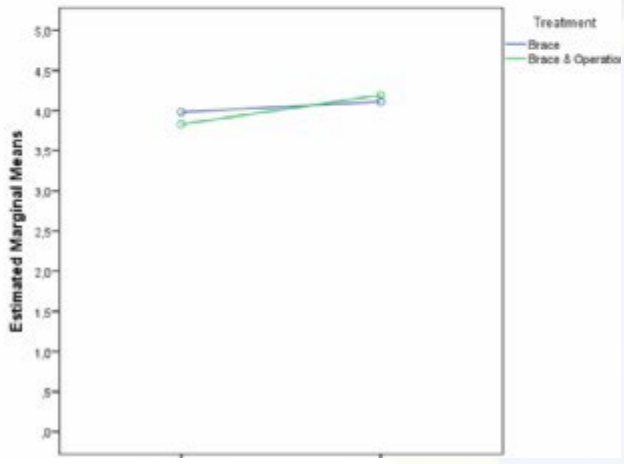
Keywords: brace, posterior instrumented fusion, AIS

Sözlü Bildiriler

brace-op







Sözlü Bildiriler

OP-11

A RETROSPECTIVE COMPARISON OF ACCURACY OF PEDICLE SCREWS İNSERTION AMONG 3D-BT NAVIGATION AND FREE HAND TECHNIQUE IN SPINAL İNSTRUMENTATION SURGERY

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PURPOSE: Spinal surgery became more popular. In spinal deformities, spinal stenosis and spinal fractures, instrumentation with pedicle screws is a widely used method. Medulla spinalis is located in the vertebral canal and the spinal nerve roots pass through the intervertebral foramen. It depends on its importance to insert the screws in the appropriate position within the pedicle. Pedicle screws can be inserted in free-hand technique or with robotic systems or in assosiated by 3D-BT navigation system. The aim of this study is to compare the accuracy of pedicle screws inserted in our institution with free hand technique and assosiated by 3D-BT navigation system.

MATERIAL/METHOD: Patients with postoperative computed tomography images who underwent spinal instrumentation with posterior approach due to deformity (kyphosis and scoliosis) in Uludağ University Medical Faculty Hospital between 2016-2018 were evaluated retrospectively. Screw positions evaluated according to Gertzbein and Robins classification. A total of 77 patients operated by the one surgeon were included in the study. 40 patients with free hand technique, 975 screws, 33 patients with 3D-BT navigation system associated, 666 screws, were observed.

RESULTS: It was seen that the screws inserted assosiated by 3D-BT navigation (502 A%75,4; 86 B%12,9; 43 C%6,5; 24 D%3,6; 11 E%1,7) were inserted in a statistically significantly better position compared to the free-handed screws(524 A%55; 216 B%22,7; 111 C%11,6; 82 D%8,6; 20 E%2,1). In addition, it was seen that the screws in the lumbar vertebraes were better positioned than the thoracic ones in both groups.

Keywords: spinal, deformity, pedicle, screw, accuracy

Sözlü Bildiriler

OP-12

DIRECT VERTEBRAL ROTATION SIGNIFICANTLY DECREASES THE PULL-OUT STRENGTH OF THE PEDICLE SCREW

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SUMMARY: In this biomechanical study we used 30 pedicles of 15 human cadaveric vertebrae. Two groups were formed. One group was DVR group and each screw was rotated with a screw driver rigidly attached to the screw head simulating the posterior vertebral derotation maneuver. Second group was the control group. Samples were placed on a universal testing machine and pull-out loads were measured. We found significantly reduced pull-out strength in DVR group when compared with the control group.

HYPOTHESIS: Direct vertebral rotation (DVR) maneuver decreases the pull-out strength of the pedicle screws due to the rotational force and micromotion in the trabecular bone.

INTRODUCTION: The use of pedicle screws in spinal surgery has become standard due to biomechanical and corrective advantages by means of three-column fixation. Direct vertebral rotation (DVR) has produced improved correction of thoracic and lumbar coronal curves compared to traditional rod derotation techniques. Although, it is reported that excessive forces while DVR maneuver may cause an anatomic failure, the pull-out strength of the pedicle screws after DVR maneuver is not known. Thus, this biomechanical study was performed to quantitatively analyze the pullout strength of a pedicle screw after DVR maneuver.

METHODS: Thoracic vertebral bodies from 3 cadavers were harvested and stripped of soft tissues. Thirty pedicules of 15 vertebrae were separated to 2 groups after bone mineral density measurements. Polyaxial 5.5 mm pedicle screws with appropriate length were inserted with a free hand technique for each pedicle. One Kirschner wire was inserted to the anterior part of the each vertebral corpus, and the half depth of each corpus were embedded into PVC pipes using polyester paste. In the DVR group, each screw was pulled horizontally with 2 kg (~20 N) load over a screwdriver rigidly attached to the screw, and a posterior vertebra derotation maneuver was simulated. Control group did not load with a DVR maneuver. Samples were placed on a universal testing machine and pullout loads were measured (Figure 1). Mann Whitney_U test was utilized within 95% confidence interval and p value <0.05 to test for the statistical significance.

RESULTS: In DVR group mean pull-out strength was 183.35 N(SD±100.12) and in the control group mean pull-out strength was 279.95 N(SD±76.26). Inter-group comparisons revealed that DVR maneuver significantly decreases the pullout strength (p=0.12)

CONCLUSION: The results of this study confirm that pullout strength of pedicle screw significantly decreases by approximately 35% when DVR maneuver is applied.

Keywords: Direct Vertebral Rotation, DVR, pedicle screw, Pull-out

Sözlü Bildiriler

OP-13

BIOMECHANICAL COMPARISON OF THREE DIFFERENT SCREW DESIGNS IN OSTEOPOROTIC SPINE FIXATION

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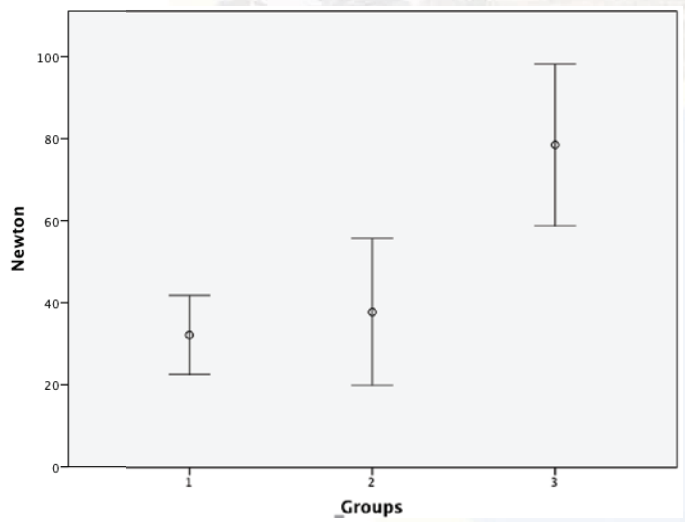
PURPOSE: The aim of this study is to biomechanically compare standart pedicle screw, dual-threaded pedicle screw, and cemented dual threaded pedicle screw in an osteoporotic spine model Materials: Twenty-four synthetic osteoporotic bone blocks were separated to 3 groups, according to the screw designs: 1) standart pedicle screw; 2) dual-threaded pedicle screw; 3) cemented dual-threaded pedicle screw. Samples were placed on a universal testing machine and pullout loads were measured. Independent samples Kruskal-Wallis test was utilized within 95% confidence interval and p value <0.05 to test for statistical significance.

RESULTS: The mean pullout strength was 32.72 N (SD±12.53) in Group 1, 37.87 N (SD±19.29) in Group 2, and 78.46 N (SD±23.59) in Group 3. The results were statistically significant (p<0.05). Inter-group comparisons revealed that cemented pedicle screws had a significantly higher pullout strength (Group 1-3 p= 0.003, Group 2-3 p= 0.015). Although dual-threaded screws had higher pullout strengths when compared with standart pedicle screws, the difference was not statistically significant (p=1.00).

CONCLUSION: Our results showed that cemented pedicle screws had significantly higher pullout strength. To achieve a more stable fixation in osteoporotic patients, cemented dual-threaded screws will be a good option.

Keywords: biomechanics, osteoporotic spine, pedicle screw, pullout

Figure 1



Biomechanical test results

Sözlü Bildiriler

OP-14

DOUBLE ROD TECHNIQUE IN PATIENTS WITH CERVICAL SPINAL STENOSIS. A NOVEL MODIFICATION OF POSTERIOR CERVICAL INSTRUMENTATION

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Introduction: Insertion of the rods to posterior instrumentations expanding from upper cervical to upper thoracic region, where subaxial lateral mass screws (C2-T1,2) and pedicle screws (C2, C7, T1, T2) are generally used, constitute an intra-operative challenge for spine surgeons.The aim of this study was to present the results of our modified cervical double rod technique for posterior cervical instrumentations expanding from upper cervical region to cervicothoracic junction.

PATIENTS AND METHODS: 43 patients operated between 2012-2017 by the same senior surgeon were included. The surgical technique comprised insertion of pedicle and lateral mass screws following standard posterior approach and connection of the pedicle screws and lateral mass screws with 4 separate rods (2 for each construct).The assessment of cervical lordosis (C2-C7) and evaluation of fusion was undertaken with the cervical anteroposterior and lateral X-rays.

RESULTS: Patients had a mean age of 68.16 (range 45-78) and a mean follow-up duration of 51.72 (range 24-72) months.All of the patients had a diagnosis of cervical spinal stenosis of minimum 3 levels. 39 patients underwent only posterior decompression, while 4 patients underwent combined antero-posterior decompression including discectomy in 2 patients and corpectomy in the remaining 2 patients. The average number of decompressed levels was noted as 3.4 (range 3-4). The average degree of cervical lordosis was detected to be improved from 12.17° (range 6-10) pre-operatively to 20.71° (range 15-26) at the last follow-up ($p<0.001$). The JOA score improved from 11.1 to 16.32 (all patients: Grade I) ($p=0.003$) as well as the NDI from 35.63 to 10.1 ($p<0.001$) and VAS score from 5.83/6.31 (arm/neck) to 1.1/1.9 ($p<0.001/p<0.001$). 3D CT scans were undertaken to two patients with the suspicion of screw loosening and delayed fusion, while no loosening and solid fusion was detected in these patients. No implant failure of pseudoarthrosis were detected in any patient at the last follow-up visit.

DISCUSSION AND CONCLUSION: Standard posterior cervical instrumentation technique comprised overbending of the rods, inability to instrument the level of C6 or obligation to conduct extensive soft tissue dissection in order to use lateral connectors for connecting pedicle screws to lateral mass screws. The modification we described here allowed instrumentation of all cervical levels while providing easier connection of pedicle screws to lateral mass screws leading to stronger biomechanical stabilization. With low rates of complications and excellent rates of fusion, this modification was detected to be a safe and effective method for the surgical treatment of cervical spinal stenosis.

Keywords: Cervical spinal stenosis, Posterior Cervical Approach, Double rod technique, Pedicle Screws, Lateral Mass Screws

Sözlü Bildiriler

OP-15

C5 NERVE ROOT PARESIS AFTER POSTERIOR CERVICAL LAMINECTOMY AND FUSION

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INTRODUCTION: C5 nerve root paresis is one of the complications of posterior decompression in cases who undergo surgery for cervical spondyloticmyelopathy (CSM). The causes of this complication are controversial and many factors have been blamed.The aim of this study was to determine the rate of post operative C5 nerve root paresis, and reveal the predisposing factor saffecting it.

MATERIALS AND METHODS: Charts of 136 cases (97 male, 39 female) with CSM, who underwent posterior decompression were reviewed retrospectively. Postoperative C5 nerve root paresis was observed in 15 patients. In addition to the demographic characteristics of the cases, the number of decompressed levels, the absence of signal increase in preoperative and postoperative MR images, and the amount of spinal cord shift in the postoperative MRI were reviewed.

RESULTS: Nine patients underwentr a 2-level decompression, 59 patients a 3-level decompression, 50 patients a 4-level decompression, and 18 patients underwent a 5-level decompression and fusion.In total, 15 patients developed C5 root paresis. In 4 patients with paresis, additional foraminotomy was performed due to painful paresis.Signal change in preoperative MRI was detected in 8 of 15 patients (53.3%) who had C5 root paresis, and in 72 of 121 cases without root paresis (59.5%).In the postoperative MRI, spinal cord shift was detected in 8 cases who had C5 root paresis (53.3%), and in 49 cases without root paresis (40.4%).

CONCLUSION: C5 nerve root paresis is one of the most common complications in CSM patients who undergo posterior decompression and fusion. It is concluded that presence of spinal cord shift in postoperative cervical MRI may play a role in the etiology of postoperative C5 nerve root palsy.

Keywords: C5, decompression, paresis

Sözlü Bildiriler

OP-16

RELIABILITY OF TWO SMARTPHONE APPLICATIONS IN SCOLIOSIS COBB ANGLE MEASUREMENT

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PURPOSE: As mobile technology has evolved, smartphone applications have been used for radiographic angle measurements in daily clinical practice. Reliability of these applications has been assessed for Cobb angle measurements in scolioisis and kyphosis, as well as hallux valgus angle measurements This study aimed to assess the reliability of two smartphone applications, which work with different mechanisms, (iPinPoint and Cobbmeter) in measuring scoliosis Cobb angles compared with of picture archive and communication systems (PACS) tools.

METHODS: Anteroposterior whole spinal digital radiographs of 30 patients were retrospectively analyzed. A spinal surgeon who was not involved in measurements determined the upper and lower end vertebrae of the curves to be measured. For each patient largest structural curve was selected for measurement. Four blinded observers, two spinal surgeons and two orthopaedic surgeons, measured the Cobb angle of the determined curves, using the software in PACS of our institution and two smartphone applications (Figure 1). Ipinpoint, is an application that uses the built-in camera of the smartphone for angular measurement. Cobbmeter is an accelometer based application which calculates the Cobb angle by measuring the tilt angles of the end vertebrae. Measurements were repeated on same radiographs after two weeks in a different order, to minimize the recall of prior measurements. The inter- and intraobserver reliabilty values were measured using intraclass correlation coefficients (ICC).

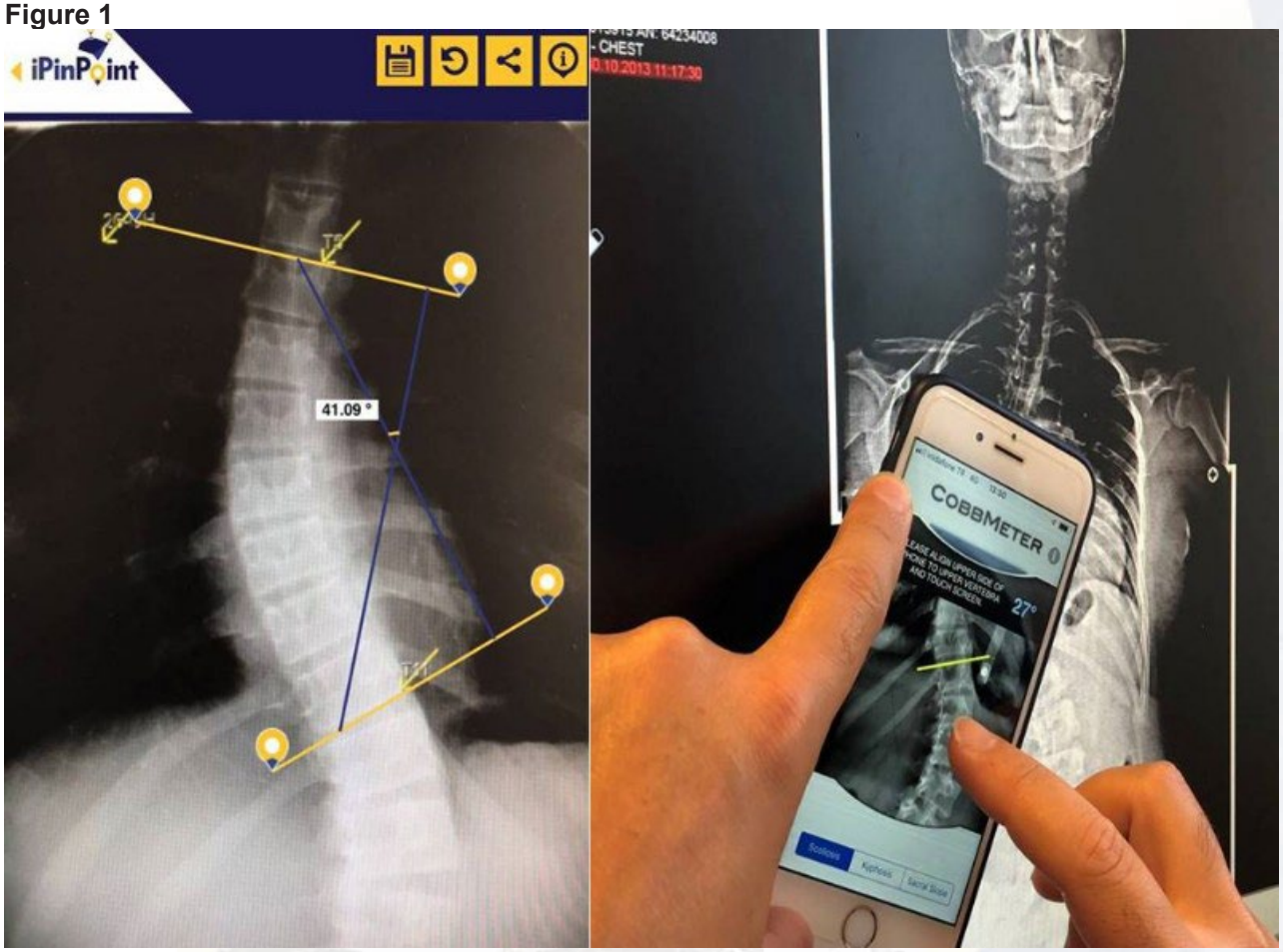
RESULTS: Twenty-three of the patients were female and 7 of them were male. Mean age of the patients was 15.2 years. Eleven patients had Lenke type 1, two had type 2, four had type 3, eight had type 5 and five had type 6 curves. Mean Cobb angle measurements of four observers for each technique are given in Table 1. Very good interobserver agreement was seen with PACS, iPinPoint and Cobbmeter measurements (ICC values 0.989, 0.979 and 0.989 respectively). Intraobserver reliability of four observers was also very good for all techniques (ICC>0.9 for all observers).

CONCLUSION: Both smartphone applications are reliable in measuring scoliosis Cobb angles, with reference to PACS tools. They may be useful when digital or manual mesurement tools are not available. For iPinPoint application it is important to keep the smartphone parallel to computer screen while taking the photos to minimize parallax errors. During measurement with Cobbmeter application special care should be given to properly align the edge of the smartphone with the endplates.

Keywords: Scoliosis, Cobb angle, smartphone, inter- and intraobserver reliability

Sözlü Bildiriler

Figure 1



Measurement with iPinPoint and Cobbmeter applications.

Table 1

Observer	PACS	iPinPoint	Cobbmeter
1	51.01±12.89	51.64±12.73	50.32±12.81
2	51.24±12.59	51.09±12.43	50.58±12.55
3	50.35±12.76	51.17±12.64	50.73±12.82
4	50.31±13.01	50.08±12.88	49.76±13.48

Mean Cobb angle measurements of all observers for each technique

Sözlü Bildiriler

OP-17

SPINE SURGERY FELLOWSHIP TRAINING IN TURKEY

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OBJECTIVES: Current study; aims to manifest the adequacy of spine surgery fellowship training (SSFT) in Turkey and to reveal what are needed for further advancement.

The current issues concerning SSFT in Turkey and demographic characteristics of those who pursue fellowship in Turkey has not been studied. Experiences and expectations are of fellows and their directors with respect to the positive and negatives of this level of training, or how this level of education fits in with Turkish undergraduate and postgraduate medical training. We searched for current status about SSFT in Turkey with it's relation to demographic characteristics, working hours, finances, residency training, clinical and research work and satisfaction with training and to reveal what are needed for further advancement.

METHODS: 30 specialists out of 40 who have completed SSFT in 3 different spine centers in Turkey, between years 2010/2018 were asked to complete 30-question survey.

RESULTS: 27 of the participants (90%) were orthopedics and traumatology and; 3 (10%) were neurosurgery specialists. Mean age was 39.4 years (35-53). Mean duration between residency and SSFT was 4 years (0-14). Mean SSFT duration was 8 (1-18) months. 70% of the attendants had participated surgery cases in their residency training clinics. 23 of the participants (76.67%) reported that spine surgery training in their institutes was not adequate during their specialty training. Seventeen of them (56.67%) believed that they could not perform spine surgery cases by themselves before SSFT. All centers (100%) providing SSFT were non-public facilities like private hospital and private university medical school hospitals, directed by a dedicated mentor with a personal effort without a accredited center for SSFT. Twenty-five (83.33%) of the participants felt that they were capable of performing a standard spine case on their own at the end of SSFT and 5 (16.67%) of them thought otherwise. This value, which was 43.33% at the end of the specialty education, was increased to 83.33% after SSFT.

CONCLUSION: The current study emphasizes the importance of SSFT in spine surgery, which is a division that has a high risk for complications, long term follow-up need, sophisticated workup and equipments. In this regard, regulations on accreditation in government based health institutions need to be done, providing ideal conditions anon. It is concluded that a graduate program supported with TOTEK, training fellowship or side branches administration in the category of accredited training would have positive effects on further development of spine surgery training in Turkey.

Keywords: Spine surgery, fellowship, subspecialty, Turkey

Sözlü Bildiriler

OP-18

SURVEY MONKEY RESULTS OF TURKISH SPINE SURGEONS TO MOST FREQUENTLY ASKED QUESTIONS ABOUT AIS

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There are controversial topics about AIS follow up and treatment. Our aim is to determine the answers of Turkish spine surgery members statistically to these questions and open some of them to debate.

MATERIAL AND METHOD: 21 multipl choice questions through survey monkey were directed to the Turkish spine society members and 103 members results responded were evaluated.

RESULTS: 82% that responded the questions are orthopedists. Thorasic scoliosis surgery endication has been identified 45 degrees in 43% cases and 50 degrees in 30%. The 67% of the surgeons consider appropiate the poliaxial choice as a screw. The 78%of the surgeons consider the postoperative infection risk few than 2% in thorakal AIS. İn preoperative informing about AIS surgery, the paraplegia risk is reported 1% by 18% of the surgeons and 0.1% by 52% of the others. The 48% of the surgeons accept that yoga, pilates and exercise have a place in treatment of AIS. The rate of physicians that think the use of corset slows AIS progression is 72%. Following a diagnosis of a case of AIS with a degree of 45-50, 80% of the surgeons recommend surgical treatment within 1 year. İn the case of AIS patients have no surgery. 31% accept the life threatining degree is 80. 51% permit contact sport at postoperative 9. month. The number of the surgeons who report that they will perform AIS operations only using with wakeup test is 31%.

DISCUSSION: The results that are obtained contain significant differences about AIS follow up, treatment and postoperative planning among the surgeons who perform spine surgery. It is obvious that this will make serious confusion and confidence problem in society. Therefore, we believe that the minimization of these differences is required in open discussion environments.

Keywords: Adelescent idiopathic scoliosis, informe consent,

Sözlü Bildiriler

OP-19

EFFICACY OF IMPAR GANGLION BLOCKADE IN PATIENTS WITH CHRONIC COCCIDIA

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Coccydynia is characterized by the pain in the coccyx region, which increases with the prolonged sitting duration. The first line of treatment is conservative. Different interventional treatment methods are applied to patients who do not benefit from conservative treatment. One of those methods is blockade of the impar ganglion. In this method, the impar ganglion in the anterior coccsigeal region is marked with a contrast agent and the blockage is done with steroid and local anesthetic. In this study, we aimed to evaluate the efficacy of impar ganglion blockade in patients with chronic coccydynia. In this study we included 21 patients (19 females and 2 males) who underwent impar ganglion blockage between 2015-2016. All of the patients first treated conservatively but they didn't benefit from it. All patients were treated with transsacrococcygeal method with scopy, and the patients were called for control at 1st week, 6th month and 12th month. VAS (Visual analog scale) was used to evaluate the severity of preoperative and postoperative pain. VAS scores were compared before and after the procedure to evaluate the efficacy of the method. Mean age of the patients was 37 years (range 22 to 80 years) and mean follow-up period was 17 months (range 12 to 24). Patients' complaints of pain were present at an average of 53 months (range 3 months to 15 years). In the etiology 15 patients had a history of falling on their hip and 2 patients had pain after pregnancy, and 4 patients had idiopathic pain. Thirteen patients had been manipulated by a non-medical bonesetter before contacting us. Mean BMI of the patients was 26,4 (range 20 to 36). Preoperative mean VAS score of the patients was 8.1 (range 6 to 10); post-operative 6. month mean VAS score was 3,5 and post-operative 12. month mean VAS score was 5. No complication occurred during or after the procedure. In patients with chronic coccydnia who do not benefit from conservative treatment, the blockade of impar ganglion is an effective treatment modality and it can be considered as a pre-operative treatment option. However, the increase in mean VAS score at 12 months of follow-up shows that pain may relapse over time.

Keywords: Coccyx, coccydnia, impar ganglion blockade, blockade of impar ganglion

impar gangliyon blockade

Sözlü Bildiriler

OP-20

PELVIC INCIDENCE AS A PROGNOSTIC FACTOR IN COCCYDYNIA

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AIM: To evaluate the pelvic incidence (PI) of coccydynia patients treated by different methods and to determine whether it is a risk factor or a prognostic factor.

MATERIAL-METHODS: Patients who were treated for coccydynia were evaluated retrospectively, and 110 patients were enrolled. Spinopelvic parameters were measured by using Surgimap software, and the position of the coccyx was evaluated according to the Postacchini classification. The results were compared to spinopelvic parameters of healthy population.

RESULTS: The mean PI of the coccydynia patients did not differ from the healthy population, and there were no differences between treatment subgroups. The Postacchini classification showed that patients with type-3 and type-4 configurations had higher PI. When treatment groups were evaluated according to Postacchini classification, 80% of the surgery group had type-3 and type-4 configurations (50%, 30% respectively).

CONCLUSION: This is the first study to evaluate the PI of coccydynia patients. Patients with higher PI were prone to having type-3 of type-4 coccyx configurations and undergoing surgical treatment.

Keywords: Coccydynia, Pelvic incidence, Treatment, Risk factor

Sözlü Bildiriler

OP-21

WHICH FACTORS AFFECT THE RADIOGRAPHIC AND CLINICAL OUTCOMES IN SELECTIVE POSTERIOR LUMBAR FUSION (COBB TO COBB) FOR LENKE TYPE 5 CURVES IN AIS: THE IMPORTANCE OF SACRAL OBLIQUE TAKE-OFF ANGLE FOR FRACTIONAL LUMBOSACRAL CURVE

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INTRODUCTION: The aim of this study is to evaluate the clinical outcomes and radiologic parameters affecting magnitude of fractional lumbosacral curve and spontaneous correction of unfused thoracic curve in Lenke Type 5 AIS patients, treated by selective posterior lumbar fusion.

METHODS: 51(47F, 4M) Lenke type 5 AIS patients treated by selective posterior lumbar fusion with segmental pedicle screws and allograft for fusion in all levels were included (2005-2016). Preop, f/up coronal and sagittal parameters were analyzed and preop Ferguson x-rays were used to measure sacral oblique take-off angle (SOTA). Clinical outcomes were evaluated with SRS-22r. Spearman's correlation test was used for statistical analysis.

RESULTS: Average age was 15(12-17) years and f/up was 7(2-13) yrs. Average thoracolumbar/lumbar (TL/L) Cobb angle improved from 42.8° to 6.3° with 85% correction rate. Spontaneous correction rate of the unfused thoracic curve was 57%. Average instrumented level was 5.5 (4-7); lower instrumented vertebra (LIV) was L2 in 2 patients, L3 in 40 patients and L4 in 9 patients. Average LIV tilt improved from 24.9° to 3.5° (86%). Average SOTA was 8° (0-16). SOTA was more than 5° in 32 (63%) patients. Fractional lumbosacral curve was more than 10° in 12 patients (24%). Disc wedging below LIV was more than 5° in 21 patients (41%). There were positive and moderately significant correlations between f/up fractional lumbosacral curve magnitude, disc wedging below LIV and SOTA ($r=0.381$, $p=0.04$; $r=0.614$, $p<0.01$, respectively). Mean total SRS-22r score improved from 3.7 to 4.3. Pseudoarthrosis was found in 1 patient (1.9%) (Loosening of 1 screw on convex side).There was no infection, neurological deficit or unfused thoracic curve progression.

CONCLUSION: Selective posterior lumbar fusion provided significant correction of TL/L curve, spontaneous correction of unfused thoracic curve and clinical improvement in Lenke Type 5 curves. Although LIV inferior end plate was parallel to the ground, 24% of the patients had postop fractional lumbosacral curve more than 10°. If sacral oblique take-off angle was more than 5° on Ferguson x-ray, the possibility of a postop fractional lumbosacral curve more than 10° and disc wedging below LIV more than 5° were higher.

Keywords: AIS, Lenke Type 5, Sacral Oblique Take-off Angle (SOTA)

Sözlü Bildiriler

OP-22

COMPARISON OF RADIOLOGIC AND FUNCTIONAL OUTCOMES ACCORDING TO DISTAL FUSION LEVEL IN LENKE TYPE 3, 5 AND 6 ADOLESCENT IDIOPATHIC ACOLIOSIS

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PURPOSE: In Lenke type 3, 5 and 6 adolescent idiopathic scoliosis (AIS) patients posterior instrumentation and fusion (PIF) is usually stopped at lower end vertebra (LEV) or one level proksimal to it (LEV-1). Occasionally, in severe cases fusion can be extended to lower levels. Our aim in this study was to compare radiologic and functional results in Lenke type 3, 5 and 6 AIS patients, in which the lowest instrumented vertebra was selected as LEV or LEV-1.

METHODS: 83 patients with Lenke type 3, 5 and 6 AIS that have mild to moderate thoracolumbar / lumbar (TL/L) curves were recruited into this study and were retrospectively evaluated. Patients with TL/L curves more than 60 degrees, LIV as LEV+1and age more than 20 years were excluded. LIV level was determined intraoperatively. After wide facet resection and correction maneuvers including rod derotation, compression, distraction and in situ bending, a level disc was tried to be achieved below LIV. In 47 patients LIV was LEV and in 36 patients LEV-1. Patients were compared preoperatively and postoperatively at final follow-up radiologically and functionally. Radiologic parameters were Cobb angle of TL/L curve, coronal balance as C7 plumb line – central sacral vertical line difference (C7PL-CSVL) and LIV related parameters (LIV tilt, LIV disc angle and LIV translation) (Figure 1). Functional outcomes were assessed using scoliosis research society (SRS-22) and Short Form-36 questionnaires.

RESULTS: 65 of the patients were female and 17 were male. Mean age was 16.1 (range: 12-20). Two groups were well matched according to demographic values, preoperative values and Lenke type distribution. Mean follow-up period was 38 months (minimum 29 months). Postoperative radiographic results were also similar, except LIV disc angle and LIV translation, which were significantly higher in LEV-1 group (Table 1). While all components of SRS-22 and SF-36 scores improved postoperatively, there were no significant differences regarding postoperative functional outcomes between groups.

CONCLUSION: In structural TL/L curves fusion to LEV-1was associated with the higher amount of LIV disc angle and LIV translation, which did not cause coronal imbalance and decreased the quality of life scores. So, in mild to moderate Lenke 5 curves fusion to LEV-1 may be an option to save one more mobile segment.

Keywords: Scoliosis, lowest instrumented vertebra, Lenke type 3-5-6

Table 1

Parameter	LEV-1 Group (preop)	LEV-1 Group (postop)	LEV Group (preop)	LEV Group (postop)	p (comparison of postoperative values)
TL/L Cobb angle (degrees)	47,8±9,1	8,6±3,8	49,2±8,5	7,4±4,3	0,835
C7PL-CSVL difference (mm)	22,9±9,1	8,7±5,1	23.8±7,6	8,2±4,6	0,693
LIV tilt (degrees)	23,7±4,8	6,4±3,1	24,8±5,4	6,1±2,7	0,485
LIV disc angle (degrees)	5,4±3,5	3,2±2,4	5,7±3,9	2,3±2,1	0,038*
LIV translation (mm)	18,9±5,3	14,8±9,1	17,4±4,7	9,8±6,7	0,026*

Comparison of radiologic values.

Sözlü Bildiriler

OP-23

LENKE 5 CURVES. IS THORACIC FUSION REALLY NECESSARY?

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BACKGROUND: Lenke type 5 curve is a major thoracolumbar/ lumbar (TL/L) curve, and, recommended surgery is to fuse this curve. Some surgeons prefer to fuse both primary TL/L curve and non-structural thoracic (T) curve (long segment fusion), some prefer selective fusion (short segment fusion). However, there is lack of data to apply selective fusion in Lenke 5 patients. This study aims to evaluate the coronal TL/L and thoracic curve correction amounts between short and long segment fusion. Hypothesis Including thoracic curve to the fusion segment in Lenke type 5 patients improves coronal plane correction amount.

METHODS: A retrospective study of AIS patients treated at a single institution was conducted. All AIS patients with Lenke type 5 patients who had no prior surgery and were treated with posterior instrumentation and who had full sets of preoperative, early postoperative and last follow-up standing full-length radiographs were included in the study. Patients who had previous spinal surgery, inadequate time for follow-up and whose radiographs did not meet standards were excluded. A total of 59 patients (55 females and 4 males) were included in the study who met all the inclusion criteria. Preoperative, early postoperative and last follow-up TL/L, T curves were measured with a computer software. Short versus long segment fusion's correction rates comparison was done by Mann-Whitney-U test.

RESULTS: 35 patients had long segment fusions while 24 patients had short segment fusions. Mean follow-up was 43°±18.05 months (54-98). Median preoperative TL/L Cobb was 40° (range 39°), median preoperative T Cobb was 22° (range 42°), median early postoperative TL/L Cobb was 7° (range 36°), median early postoperative T Cobb was 3°(range 20°), median last follow-up TL/L Cobb was 7° (range 35°), median last follow-up T Cobb 4 ° (range 18°). The only significant difference was observed in thoracic Cobb correction rates both in the early and late follow-up periods. (p=0.034, p=0.017, respectively)

CONCLUSIONS: Long segment fusion in Lenke type 5 patients seem to establish better correction rates during early postoperative period. However, in the long term this advantage diminishes probably as a result of compensation.

Keywords: adolescent idiopathic scoliosis, Lenke type 5, selective fusion

Sözlü Bildiriler

OP-24

COMPARISON OF SHORT LEVEL (SELECTIVE) AND LONG LEVEL (NONSELECTIVE) FUSION WITH POSTERIOR APPROACH IN LENKE TYPE 5C ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS

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The goal of the surgery of the Lenke 5C AIS is to provide the coronal and sagittal global balance of the spine while keeping the mobile segment as mobile as possible. Anterior or posterior selective (short level) fusion in Lenke 5C AIS is an important option with an increasing trend. Since short-level fusion criteria are not yet defined in the literature, we compare results with long-range fusion.

It is aimed to compare the effects of short and long level fusion on spinal balance. 105 patients who met our studies criteria operated in Baltalimanı Bone Disease Training and Research Hospital Orthopedics and Traumatology Clinic. 47 patients had short-level fusion and 58 patients had long-level fusion. Coronal, sagittal, shoulder and spinopelvic parameters were evaluated statistically on the graphs of preoperative, early and long term follow up of the patients. In our study, the duration of surgery (178.3 / 272.8 min) and the amount of blood transfused (585,1 / 1099,1 ml) were significantly lower than those of long-term fusion patients (p <0,05). Preoperative cobb values were measured 45,9o in selective fusion cases, while in nonselective fusion cases cobb values measured 53,2o preoperatively. The thoracic cobb angle was 16,9o in selective fusion cases, 22,8o in nonselective fusion cases and a significant difference was observed (p <0.05). The coronal balance was found to be significantly higher in the selective fuse with 21.8 mm, while it was found to be stable at 7.9 mm in long-term follow-up and not significantly different from long-range fusion. The coronal balance was found to be significantly higher in the selective fuse with 21.8 mm, but it was found to be regressed at 7.9 mm in long-term follow-up and not significantly different from long-range fusion cases. In short-term fusions, LIV slope was significantly higher before the surgery, but there was no difference between the two groups in long-term follow-up (p> 0.05). Pelvic obliquity did not improve in long term in selective fusion patients, but there is significant improvement in nonselective fusion cases(p <0,05). There was a significant increase in thoracic kyphosis in both groups (p <0,05).

Keywords: adolescent idiopathic scoliosis, Lenke 5C, selective fusion, thoracolumbar/ Lomber Deformity

Sözlü Bildiriler

OP-25

CAN DISCHARGE TIME BE AFFECTED BY HAEMOGLOBIN LEVEL CHANGE IN SCOLIOSIS SURGERY?

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AIM: Surgical treatments for scoliosis are being applied with an increasing frequency in specialized clinics in deformity surgery. The prolongation of postoperative stay in hospital increases the costs. aim of this cross-sectional study is to investigate the effect of perioperative haemoglobin change during the operation of scoliosis on hospital discharge time.

METHOD: The data of 90 patients who underwent deformity surgery via posterior approach for spinal instrumentation with fusion between 2013-2018 at the Department of Orthopedics and Traumatology of Dokuz Eylül University were analyzed. The age, sex, preoperative, postoperative and exit haemoglobin and hematocrit levels, Cobb angles, instrumentation levels, preoperative hospital stay and postoperative hospital stay, were evaluated. The data analysed by using SPSS statistics 21.0 for Windows. The relationship between the variables was calculated by using the Student's T-test.

RESULTS: The mean age of the patients was 14.34±3.18 years. 80% of the patients were female, and 20% were male. The mean preoperative haemoglobin was 12.87±1.31g/dL, the mean preoperative hematocrit was 38.85±3.73, the mean postoperative haemoglobin was 9.95±1.55 g / dL, and the mean postoperative hematocrit was 29.71±4.69. Mean haemoglobin 9,61±1,12gr / dL, mean exit hematocrit 28,56±3,53, mean preoperative haemoglobin-postoperative haemoglobin difference 2,91±1,62, mean preoperative hematocrit-postoperative hematocrit difference 9,13±4,82 Mean preoperative haemoglobin - output haemoglobin difference was 3.25±1.47, mean preoperative hematocrit-output hematocrit difference was 10.29±4.37, mean preoperative hospital stay was 4.36 ±5.40 days, mean postoperative hospital stay was found as 6.39±5.52 days. The patients who were hospitalized for six days or longer and postoperative less than six days were divided into two groups. There was a significant difference between the preoperative and postoperative haemoglobin changes of the patients who stayed more than six days postoperatively. Also, a significant difference was found between the patients staying in the hospital for more than six days and the patients who had more than 12 levels of instrumentation (p= 0.026).

CONCLUSION: Perioperative blood management is a topic that is frequently debated in the scientific literature. According to the results of this study, independent from the blood transfusion regime, the difference between the patient's preoperative and postoperative haemoglobin levels affect the discharge time. Increased level of haemoglobin change before and after the operation increases the length of hospital stay. This may lead to an increase in cost and indirect complications. According to the findings of this study, it is not enough to shorten the discharge time by transfusing blood postoperatively.

Keywords: scoliosis, spinal fusion, anaesthesia

Sözlü Bildiriler

OP-26

TIME-DEPENDENT INTERPRETATION OF MECHANICAL COMPLICATIONS USING COX REGRESSION AND SURVIVAL ANALYSIS

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PURPOSE: Risk factors associated with mechanical complications after ASD surgery are multifactorial and plentiful (>60 have been suggested). Duration of follow-up emerges to be one of the most important determinants. Thus, factors affecting the occurrence and timing of mechanical complications should be assessed together in multifactorial Cox regression and survival models.

MATERIAL-METHODS: Inclusion: ≥4-level fusion. Univariate tests included 66 factors derived from preoperative (25 history, demographic, radiographic), operative (32 technique and implant-related data), and postoperative (9 radiographic) data. To avoid multicollinearity, correlations were assessed guided by clinical expertise. Multivariate Cox proportional hazards models were created to estimate survival time probabilities and predict independent factors affecting the occurrence and timing of mechanical complications.

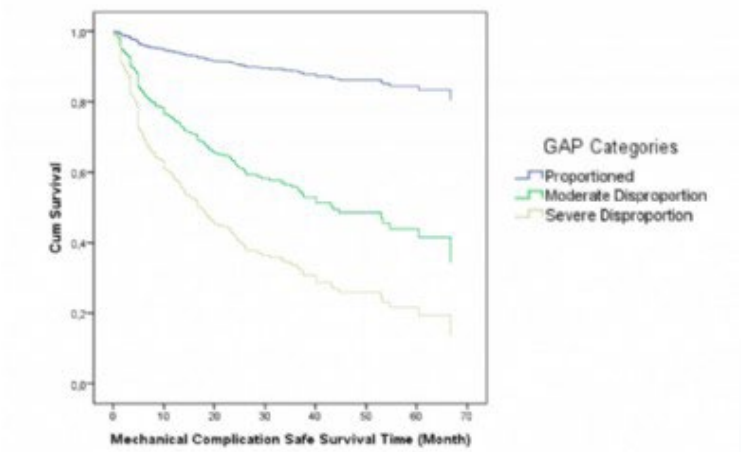
RESULTS: 697 patients (551F, 146M, 53±19 yrs) with a mean f-up of 29.5 (1.5-94) months were included. 29 factors were identified as significant and near significant ($p<0.25$), and was included in multivariate analysis. Sagittal plane reconstruction quantified by the postoperative GAP Score, sacroiliac fixation, age, postoperative T10-L2 sagittal angle, the number of levels fused and the number of rods were most important factors. Moderately and severely disproportioned states displayed 4.9 (95% CI 3.1-7.8) and 8.7(95% CI 5.4-14), times higher Hazards Ratios, respectively ($p<0.001$). Patient with sacroiliac fixation experienced 1.8 greater odds of incurring a mechanical complication compared to thoracolumbar fusions ($p=0.01$). Rates of mechanical complications increased as age ($p=0.004$), the number of levels fused($p=0.002$) and postoperative T10-L2 sagittal angle ($p=0.009$) increases. Using double-rod constructs decreased the likelihood of incurring a mechanical complication ($p=0.029$).

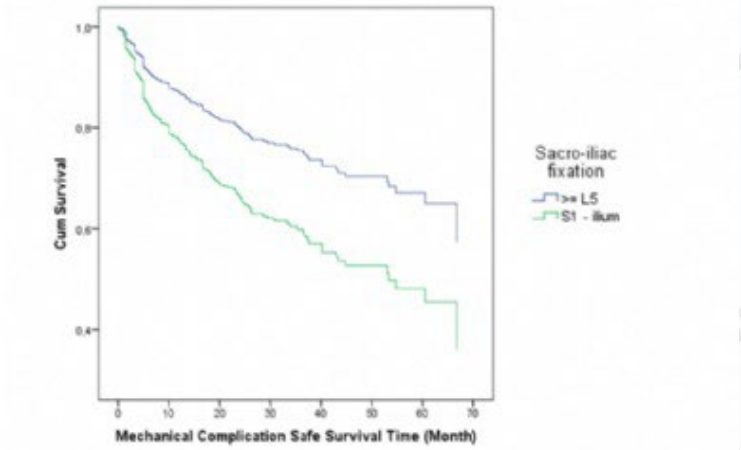
CONCLUSIONS: A total of 6 factors regarding demographics, technical details and sagittal radiographic measurements were identified affecting the occurrence and timing of mechanical complications. Survival graphs for the most important features were depicted. The postoperative GAP Score, sacroiliac fixation, age, postoperative T10-L2 sagittal angle, the number of levels fused and the number of rods were found to be independent factors affecting the occurrence and timing of mechanical complications.

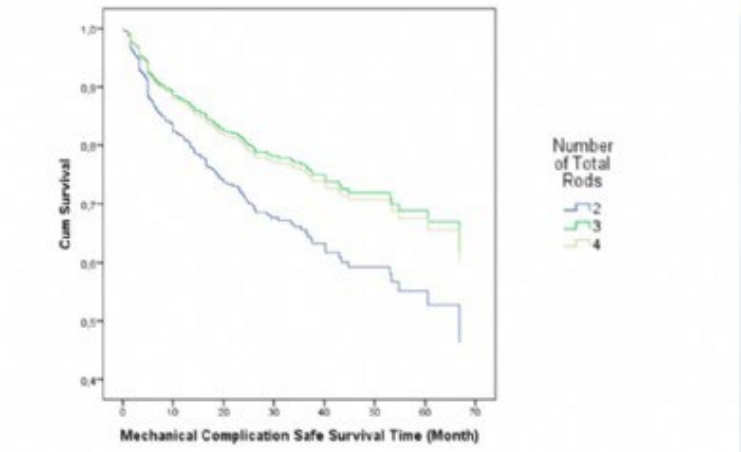
Keywords: adult spinal deformity, mechanical complications, time-dependent interpretation

Sözlü Bildiriler

COX







Sözlü Bildiriler

OP-27

CORRELATIONS OF PELVIC INCIDENCE-BASED RELATIVE RADIOGRAPHIC PARAMETERS TO LOWER EXTREMITY COMPENSATIONS

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PURPOSE: As a response to positive sagittal malalignment, the human body progressively recruits compensatory mechanisms in the spine and/or non-spinal segments (i.e lower extremities) in an effort to maintain the gravity line and a horizontal gaze. Whole-body radiographic assessment is hence suggested for quantifying lower extremity compensation. Yet, such imaging modalities are not widely available. Relation of Relative Pelvic Version (RPV), Relative Lumbar Lordosis (RLL) and Relative Spinopelvic Alignment (RSA) to previously defined lower extremity compensation angles were investigated.

MATERIAL-METHODS: Inclusion: Having radiographs that include at least mid-femur or mid-tibia; ≥4-level fusion. Pre and postoperative RPV (measured minus ideal sacral slope), RLL (measured minus ideal lumbar lordosis), RSA (measured minus ideal global tilt), femoral obliquity angle (FOA), knee flexion angle (KFA) and global sagittal angle (GSA) were measured. Preoperatively, relation of relative radiographic parameters to lower extremity compensation angles was assessed by Kruskal-Wallis tests. Correlations of changes in RPV, RLL and RSA, from preoperative to postoperative radiographs, to changes in FOA, KFA and GSA were assessed by Spearman's correlations.

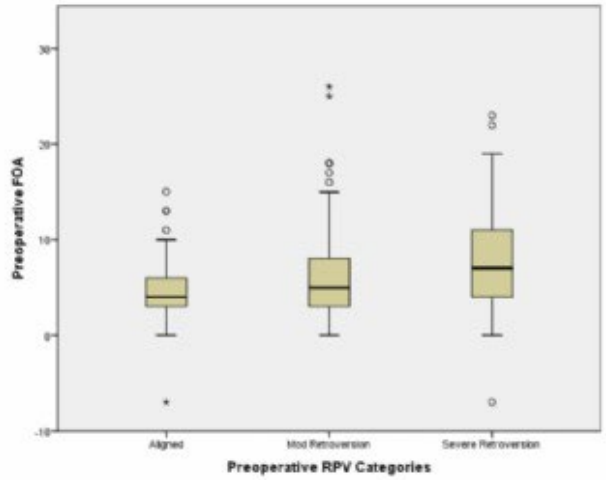
RESULTS: 193 patients (knee available in 144) (156F, 37M, 58±17 years) with a mean f-up of 36 (24-67) months were included. Preoperatively, FOA, KFA and GSA were significantly different in categories of RPV, RLL and RSA (for all comparisons, $p<0.01$). Changes in RPV, RLL and RSA were significantly correlated to changes in FOA, KFA and GSA (rho range, 0.351-0.767) (for all comparisons, $p<0.001$).

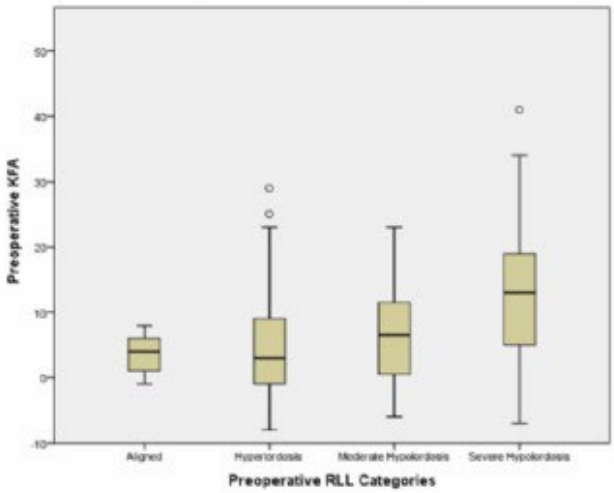
CONCLUSIONS: PI-Based relative radiographic parameters significantly correlate to measurements reflecting lower extremity compensation. Preoperative to postoperative changes in PI-Based relative radiographic parameters of RPV, RLL and RSA, reflect into changes in measurements quantifying lower extremity compensations such as FOA, KFA and GSA. This information may be useful when whole-body imaging is not available. Setting surgical goals in the sagittal plane on the basis of the parameters reflected by the GAP score may result in spontaneous resolution of lower extremity compensations.

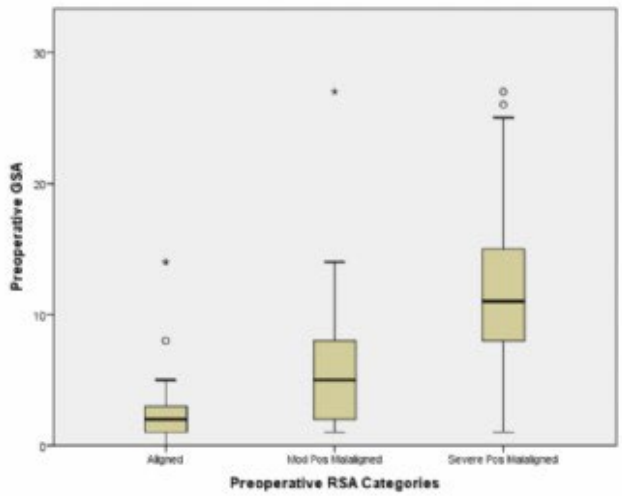
Keywords: compensation, adult spinal deformity, sagittal plane

Sözlü Bildiriler

AP-lower extremity







Sözlü Bildiriler

OP-28

SAGITTAL SPINAL ALIGNMENT AFTER RECONSTRUCTION OF NEGLECTED HIP DYSPLASIA WITH A TOTAL HIP ARTHROPLASTY: DOES CHANGING THE DISTORTED MECHANICS OF HIP NORMALIZES SPINAL ALIGNMENT?

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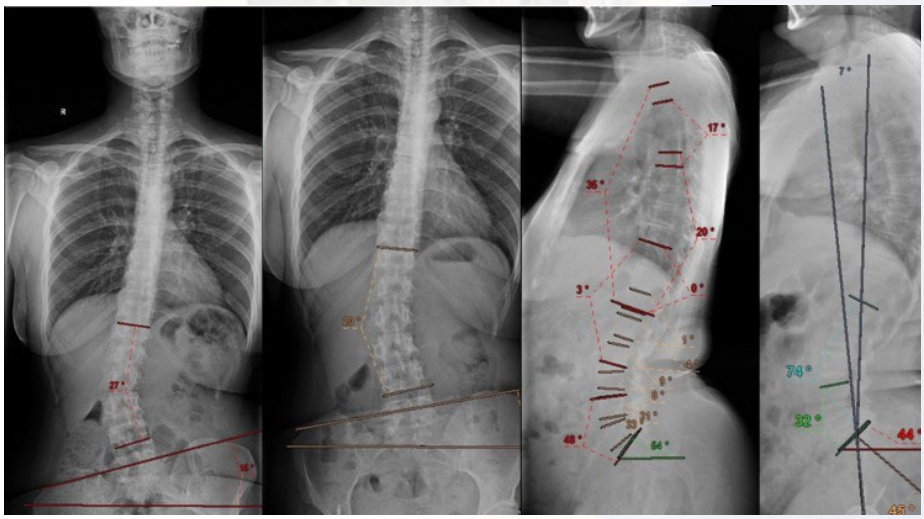
Lumbopelvic anatomy was adversely affected in adult patients with neglected high hip dysplasia. We know that these patients likely have increased lumbosacral lordosis and pelvic tilt due to posteriorly located false acetabulum. Total hip arthroplasty (THA) with femoral shortening transfers the femoral head from false acetabulum into its anatomic location. There is a lack of knowledge how sagittal alignment and pelvic parameters change after THA surgery in this specific patient group. True acetabulum lies more medially and anteriorly compared with false acetabulum. The excessive pelvic tilt and lordosis should be decreased after total hip arthroplasty surgery. 12 patients with Crowe type 3 or 4 hip dysplasia, who underwent THA operation in our institution, were evaluated after completion of the rehabilitation of the hip prosthesis and return to their normal daily life. Sagittal alignment (sacral slope, pelvic incidence, global tilt, segmental lordosis, segmental kyphosis, GAP score) and coronal alignment angles (coronal tilt, Cobb angle) of patients were measured by two independent observers. 3 of 12 patients underwent bilateral THA. Interobserver agreement was moderate to high in all measurements (0.76-0.92). There was not any statistically significant difference in any sagittal or pelvic parameters postoperatively (P>0.05). We found higher lumbar lordosis (66.58 ± 11.23) and sacral slope (50.5 ± 9.94) angles, but the pelvic incidences (55.75 ± 10.1) were in normal ranges in these patients. GAP scores also did not change significantly (P>0.05). The spinal parameters are out of standard ranges in patients with neglected dysplasia of the hip and we do not recommend to use normative values of sagittal alignment in the treatment of lumbar degenerative problems in patients with neglected high hip dysplasia. The reconstruction of distorted mechanics of hip joint does not normalize the pelvic and sagittal spine anatomy.

Keywords: sagittal alignment, hip dysplasia, total hip arthroplasty

Preoperative and postoperative measurements of sagittal and coronal alignment



Sözlü Bildiriler

OP-29

ARTIFICIAL INTELLIGENCE BASED HIERARCHICAL CLUSTERING OF PATIENT TYPES AND INTERVENTION CATEGORIES IN ADULT SPINAL DEFORMITY SURGERY: TOWARDS A NEW CLASSIFICATION SCHEME THAT PREDICTS QUALITY AND VALUE

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[15]Brighton, CO, US

PURPOSE: Prior adult spinal deformity classifications have focused on the sagittal plane and apex location. Recent work suggests there are many other impactful preoperative data points. However, the ability to segregate patient patterns manually based on hundreds of data points is beyond practical application for surgeons. Unsupervised machine-based clustering of patient types alongside surgical options may simplify analysis of ASD patient types, procedures and outcomes. The aim of the study is to apply artificial intelligence (AI)-based hierarchical clustering as a step toward a classification scheme that optimizes overall quality, value, and safety for ASD surgery.

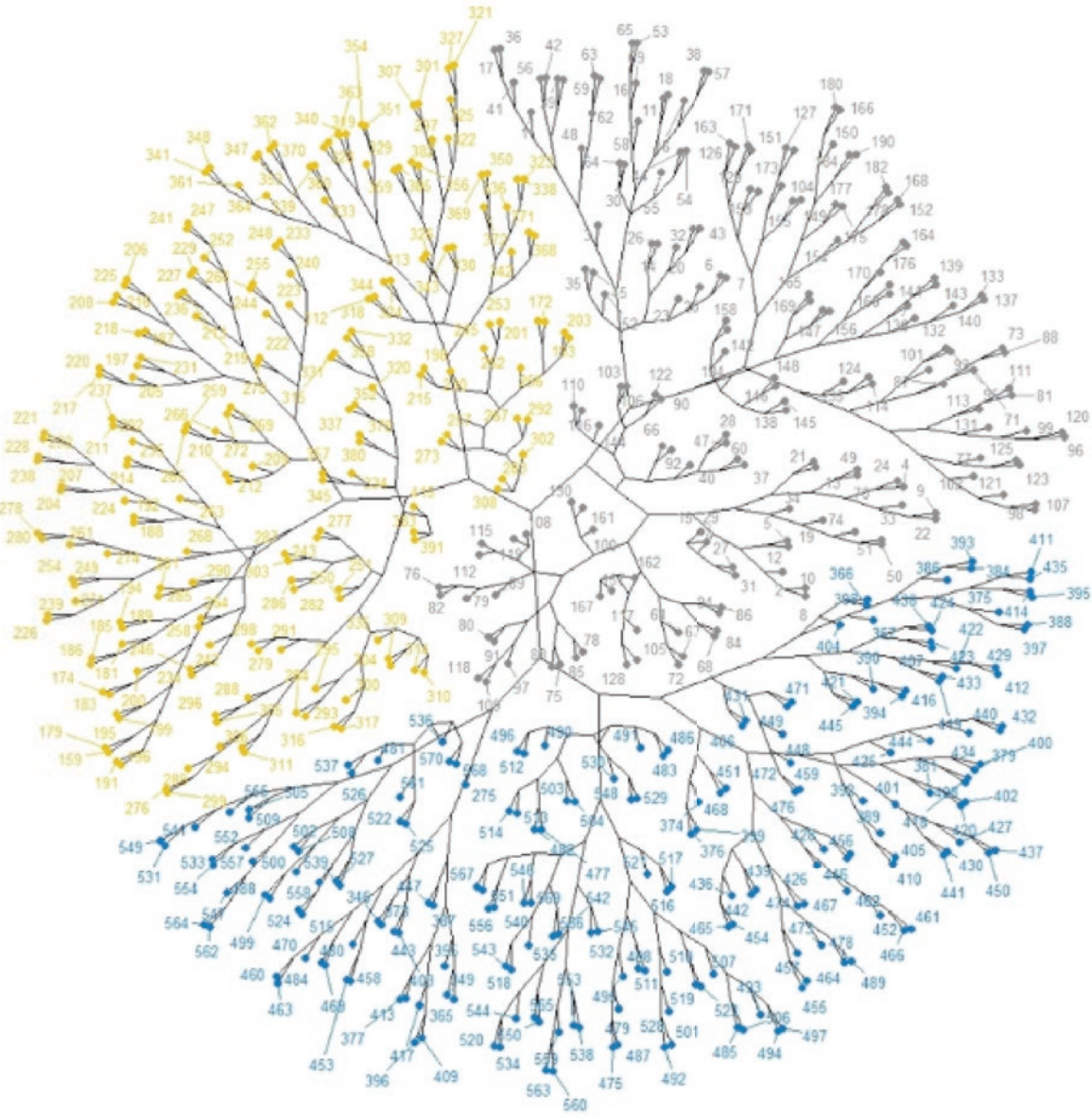
MATERIAL-METHODS: Two prospective cohorts were queried for surgical adult spinal deformity patients with baseline, 1-year, and 2-year SRS-22/ODI/SF-36v2 data. Two dendrograms were fitted, one with surgical features and one with patient characteristics. Both were built with Ward distances and optimized with the Gap method. For each possible n patient cluster by m surgery, normalized 2-year improvement and major complication rates were computed.

RESULTS: 570 patients were included. Three optimal patient types were identified: young with coronal plane deformity (YC, n=195), older with prior spine surgeries (ORev, n=194), and older without prior spine surgeries (OPrim, n=218). Osteotomy type, instrumentation and interbody fusion were combined to define 4 surgical clusters. The intersection of patient-based and surgery-based clusters yielded 12 subgroups, with major complication rates ranging from 0% to 51.8% and 2-year normalized improvement ranging from -0.074% for SF36v2 MCS in cluster [1,3] to 100.21% for SRS self-image score in cluster [2,1]).

Sözlü Bildiriler

CONCLUSIONS: Unsupervised hierarchical clustering can identify data patterns that may augment preoperative decision making through construction of a 2-year risk-benefit grid. In addition to creating a novel AI-based adult spinal deformity classification, pattern identification may facilitate treatment optimization by educating surgeons on which treatment patterns yield optimal improvement with lowest risk.

Keywords: Adult Spinal Deformity, Artificial intelligence (AI)-based clustering, Clustering



Sözlü Bildiriler

OP-30

DOES INTRAOPERATIVE LATERAL X-RAY IN PRONE POSITION CHANGE THE PREOPERATIVE SURGICAL PLAN IN TREATMENT OF ADULT SPINAL DEFORMITY?

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INTRODUCTION: The surgical strategy for the restoration of the sagittal balance is generally planned according to the sagittal parameters (Thoracic kyphosis (TK), lumbar lordosis (LL), Pelvic incidence (PI)) measured on the standing x-rays. General anesthesia for surgery provides full muscle relaxion and eliminates the pain. Therefore, sagittal parameters measured on Intraoperative lateral (IOL) x-ray in prone position taken under general anesthesia can be different. The preop surgical plan may change according this difference. The aim of this study is to analyze whether Intraoperative lateral x-ray taken in prone position at the beginning of the surgery changes the preop plan (osteotomy type or level) in adult deformity surgery.

METHODS: 57 (21M, 36F) adult spinal deformity patients were included. All patients were positioned on the same spinal surgery frame with hips and knees in neutral position to achieve maximum LL. All IOL x-rays were taken at the beginning of surgery before the incision. Sagittal parameters and local kyphosis angle were measured on the preop standing, IOL and f/up lateral x-rays. Preop surgical plans were compared with the surgical procedure performed and changes in preop plan after IOL x-ray were noted.

RESULTS: Mean age 68 (37-85) years. Mean lumbar lordosis was -29.4° on preop standing and -38.5° on Intraoperative lateral x-ray. The difference was significant ($p<0.05$, $Z=-4.72$). Mean thoracic kyphosis was 36.6° on preop standing and 41° on Intraoperative lateral x-ray. ($p>0.05$). Local kyphosis angle was 18.2° on preop standing 3.5° on Intraoperative lateral ($p<0.05$, $t=8.986$). Intraoperative lateral x-ray changed preop surgical plan in 24 patients (42.1%) and osteotomy type (3CO to PCO or IBF) in 20 patients (35%). In 1 patient Intraoperative lateral x-ray changed the level of 3CO. Ideal lumbar lordosis was achieved in 87.7% patients according to PI-LL mismatch.

CONCLUSION: Intraoperative lateral x-ray in prone position taken under general anesthesia provides muscle relaxion and eliminates pain therefore shows true lumbar lordosis. Intraoperative lateral x-ray changed the preop plan in 42% patients. Ideal lumbar lordosis is achieved in 87.7% patients. Intraoperative lateral x-ray should be used for decision making.

Keywords: adult spinal deformity, Intraoperative lateral x-ray, under general anesthesia

Sözlü Bildiriler

OP-31

ARE PLAIN RADIOGRAPHS ACCURATE FOR DETECTION AND CLASSIFICATION OF LUMBOSACRAL TRANSITIONAL VERTEBRAE?

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INTRODUCTION: Lumbosacral Transitional Vertebrae (LSTV) are congenital spinal anomalies defined as either sacralization of the lowest lumbar segment or lumbarization of the most superior sacral segment of the spine. Castellvi described a radiographic classification system on the basis of morphologic characteristics with plain AP radiographs. Different imaging modalities (Ferguson view, MRI and CT) can be used to diagnose this minor abnormality but plain anteroposterior (AP) radiographs are the most preferred method in clinical practice. The purpose of this study was to evaluate the interobserver and intraobserver reliability of detection and classification of LSTV with plain AP radiographs.

MATERIALS-METHODS: Conventional standing plain AP radiographs of 3230 asymptomatic male cadets (age 18-21) were retrospectively reviewed by two independent, blinded readers. Radiographs with a clear visibility of all lomber transverse processes, sacral wings and last rib's vertebral body articulation were included for further analysis. Any radiographs which didn't fit these criteria and radiological evidence of previous spinal surgery were excluded. Radiographs were classified according to the Castellvi classification. Inter-observer and intra-observer reliability were assessed using kappa statistics for detection of an LSTV and identification of all subtypes (seven variants; 1: LSTV type I, 2: LSTV type 1b, 3: LSTV type 2a, 4: LSTV type 2b, 5: LSTV type 3a, 6: LSTV type 3a, 7: LSTV type 3b).

RESULTS: Inter-observer reliability was moderate for the detection (k=0.43) and fair for classification (k=0.203) of LSTV in plain AP radiographs. Further intra-observer reliability was fair for the detection and classification of LSTV (k=0,43 and k=0,40,respectively).

CONCLUSION: Plain AP radiographs are insufficient to detect or classify LSTV.

Anahtar Kelimeler: Lumbosacral Transitional Vertebrae, LSTV, plain radiograph

Sözlü Bildiriler

OP-32

OUTCOMES OF THE LUMBAR FACET JOINT CYST EXCISION WITH A MINIMALLY INVASIVE METHOD

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AIM: Facet joint cysts are intraspinal and extradural synovial cysts originating from the facet joint. Although they are mostly asymptomatic, they can cause to radiculopathy, lower back pain, neurogenic claudications and cauda equina syndrome. In patients, who are unresponsive to conservative modes of treatment, other treatment options include imaging-guided cyst rupture, surgical excision and excision with fusion. In this study, we would like to share the clinical outcomes of cyst excision with a minimally invasive method in 12 patients with a lumbar facet mass, who were unresponsive to a three-month conservative treatment.

METHOD: In this retrospective study, 12 patients with symptomatic facet joint cysts underwent minimal inferolateral laminotomy, lateral flavectomy, minimal medial facetectomy and cyst excision. The facet cysts classified according to Neurospine Surgery Research Group (NSURG). Clinical outcomes were determined according to the pre-operative and final visit Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) scores. Complications and recurrences were investigated.

RESULTS: The mean age of the patients was 55.5 (39-72) years. Gender distribution of the patients was 7 males and 5 females. According to NSURG classification, 7 patients had grade I, 4 had grade II, and 1 had grade III lesions. Five of the cysts were observed at the level of L5-S1, 4 at L4-L5, 2 at L3-L4, and 1 at L2-L3. The most common symptom was low back pain in all patients, and unilateral radicular leg pain was diagnosed in 8 patients on the right leg and in 4 patients on the left leg. All patients had sensory deficits and 8 patients had additional motor deficits. No neurogenic claudication or bladder and/or bowel dysfunction was present in any of the patients. The mean VAS score of the patients was 7.7 (6-9) in the pre-operative period and it decreased to 2 (1-4) after the operation. The mean ODI score of the patients was 43.7 (38-52) pre-operatively and it decreased to 12.8 (11-19) postoperatively. No complications occurred in none of the patients. No recurrences were observed in the final follow-up visit, which took in 13.8 (6-24) months.

CONCLUSION: Cyst excision with this technic allowing for sufficient decompression without causing instability, Instead of performing cyst excision with classical hemilaminectomy for the treatment of facet joint cysts. Minimally invasive cyst excision provides sufficient outcomes in patients with Grade I-II-III lesions as we have observed in our series, however, fusion should be considered in patients with Grade 4 or 5 lesions.

Keywords: Facet cyst excision, Lumbar facet cyst, Minimally invasive spine

Sözlü Bildiriler

OP-33

THE EFFECTS OF LUMBAR FACET JOINT OSTEOARTHROPATHY ON PATIENT CLINIC: COMPUTED TOMOGRAPHY OSTEOABSORPTIOMETRY FINDINGS

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PURPOSE: Facet joint osteoarthritis is one of the pain generators in the lumbar spine. However, its exact diagnosis and contribution on low back pain (LBP) remains to be detected. The aim of this study is to measure the subchondral bone mineral density (SBD) at the lumbar facet joint in patients with LBP, to investigate the relationship between the change in density and the patient's pain, and to test the effect of facet joint osteoarthritis on low back pain.

METHODS: In vivo measurements of lumbar facet joint SBD (L1/2 to L5/S1) in Hounsfield units (HU) were performed on 30 volunteers (16 without and 14 with LBP) by computerized tomography osteoabsorptiometry (CT-OAM) at subchondral regions between 1 mm and 2 mm below the joint surface. The facet surface was divided in 3 topographic zones: lateral, medial and center.

RESULTS: A total of 600 facet joint surfaces were analyzed. Facets were denser ($p<0.0001$) both in superior facets and in subjects with LBP ($p<0.0001$). For the entire cohort, the facet medial zone SBD was higher ($p<0.0001$) than that of the lateral zone. The facet degeneration was more frequent in patients with facet joint tropism. In this group of patients, the SBD value was higher.

CONCLUSIONS: The analyses indicate that SBD is highest in patients with LBP, the superior facets, and the medial zone of the facets. SBD is thought to reflect the stress on a joint. Higher SBD values in the medial zone indicate predominant stress transmission through this part of the facet joints. Finally, the higher SBD in patients with LBP may reflect misdistribution of loading within the joint.

Keywords: Facet joint osteoarthritis, computerized tomography osteoabsorptiometry, low back pain

Sözlü Bildiriler

OP-34

THE PRESACRAL RETROPERITONEAL APPROACH FOR AXIAL LUMBAR INTERBODY FUSION FOR LOMBER PSEUDOARTHROZIS

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OBJECT: Axial lumbar interbody fusion (AxiaLIF) is a minimally invasive presacral surgical technique that damages neither the anulus brosus nor the anterior or posterior longitudinal ligaments. AxiaLIF is also indicated for treatment of unsuccessful previous fusion. As a whole, the initial experience with the AxiaLIF device demonstrates high (85%–93%) fusion rates, signif icant improvements in pain and function, low complication rates (0%–3%), minimal procedural blood loss (30–88 cc), and a short hospitalization stay. The purpose of this article is to report results and complications associated with 2-level presacral AxiaLIF for pseudoarthrozis with a minimum of 12 months of follow-up

METHODS: In this retrospective, nonrandomized, single-center study, 14 patients underwent presacral AxiaLIF surgery at the L4–5 and L5–S1 levels. Clinical outcomes were assessed using the Oswestry Disability Index and the visual analog scale for back and leg symptoms. Radiographic parameters, such as segmental lordosis, disc height and bone fusion, were analyzed using radiographs and CT scans. Complications and revision surgeries were recorded as needed. The minimum follow-up was 12 months (up 24 to months).

RESULTS: There were no intraoperative complications. One major complication was observed: a patient developed septicemia that resolved after proper care. Significant reductions in pain and disability occurred as early as three weeks post-operatively and were maintained. Fusion was achieved in 12 of 14 patients (85%) at 12 months and in 14 patients (100%) at 18 months. Clinical outcomes scores showed overall improvement in pain and physical function.

CONCLUSION: Minimally invasive axial interbody lumbar fusion via a presacral approach is a technically feasible procedure that is associated with high fusion rates, significant improvements in pain and function, and low complication rates.

Keywords: AxiLIF, pseudoarhtrosis, degeneratif spine

Sözlü Bildiriler

OP-35

DOES ENHANCED RECOVERY AFTER SURGERY PROTOCOL CHANGE COST AND OUTCOME IN SINGLE LEVEL LUMBAR MICRODISCECTOMY

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OBJECTIVE: Enhanced recovery after surgery (ERAS) is a multimodal approach that aims to improve perioperative surgical outcomes. The aim of this study was to evaluate the benefits of ERAS in terms of cost-effectiveness and postoperative outcomes in single level lumbar microdiscectomy.

METHODS: This study was a single center retrospective pre-post implementation of the ERAS pathway. Data were collected from patients' electronic medical records undergoing single level lumbar microdiscectomy during two time periods. The groups were defined as pre ERAS 2 years before and ERAS after the implementation of ERAS protocols. Each group consisted of 60 American Society of Anesthesiologists (ASA) I patients. Patients ASA II–V and aged<18 and >65 years were excluded from the study. Groups were compared in terms of age, gender, body mass index (BMI), perioperative hemodynamics, operation time, intraoperative blood loss, intraoperative fluid intake, intraoperative opioid consumption, first oral intake, first mobilization time, postoperative nause and vomiting (PONV), preoperative-postoperative visual analog scale (VAS), postoperative analgesic requirements, length of hospital stay and cost of anesthesia.

RESULTS: The two groups were comparable with respect to age, gender and BMI. The operation time, intraoperative blood loss, intraoperative opioid consumption and fluid intake were less in the ERAS group. First oral intake and first mobilization were earlier in the ERAS group. The incidence of PONV was less in the ERAS group. Postoperative analgesic requirements and postoperative VAS scores were significantly less in the ERAS group. The length of hospital stay was not statistically differ between the groups. ERAS group was found cost-effective.

CONCLUSION: ERAS with its clinical and economic benefits are associated with improved outcomes in lumbar microdiscectomy.

Anahtar Kelimeler: Enhanced recovery after surgery, ERAS, Lumbar microdiscectomy, Cost-effective, Economics

				Groups		P value
		Total (n = 120)	Pre-ERAS (n = 60)		ERAS (n = 60)	
Age (year)	Min-Max (mean) Mean±SD	34 - 64 (51) 50,12 ± 6.43	35 - 60 (51) 49,80 ± 6,04		34 - 64 (51.5) 50,43 ± 6.84	0.691
Gender	Female Male	65 (54.2) 55 (45.8)	35 (58.3) 25 (41.7)		30 (50.0) 30 (50.0)	0.360
BMI (kg/m2)	Min-Max (mean)	20.5 - 35.9 (27.8)	20,5 - 35.9 (27.7)		20,6 – 37.8 (27.8)	
	Mean±SD	28.33 ± 4.63	28,56 ± 5.34		28,09 ± 3.83	0.918

Table 1

Demographic parameters, BMI

Sözlü Bildiriler

OP-36

SPINAL ANESTHESIA SHORTENS THE RECOVERY TIME AFTER LUMBAR DISC SURGERIES: A RANDOMIZED PROSPECTIVE STUDY

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[2]Health Sciences University Ümraniye Training and Research Hospital, Neurosurgery Department

OBJECTIVE: The aim of this study was to compare the advantages of spinal anesthesia (SA) and general anesthesia (GA) for lumbar disc surgeries in terms of their cost-effectiveness and postoperative outcomes.

MATERIALS AND METHODS: We randomly allocated 100 consecutive patients with single-level lumbar disc herniation, who were scheduled to undergo lumbar microdiscectomy, into either SA or GA groups. We recorded many parameters, including demographic aspects, body mass index (BMI), perioperative hemodynamics, surgery start time, operation time, blood loss, preoperative and postoperative pain scores, postoperative analgesic requirements, first mobilization time, first oral intake, length of hospital stay, time to return to work and perioperative anesthetic costs. Both patients and neurosurgeons were handed a questionaire in order to determine their satisfaction with the procedure before discharge.

RESULTS: We found many variables to be better in the SA group: The mean arterial pressure and heart rate changes were significantly lower, the surgery start time and operation time, the length of hospital stay, and the time until returning to work were shorter; the postoperative visual analog scale (VAS) score, the analgesic requirements, the intraoperative blood loss, and the cost of anesthesia were all lower; the first mobilization time and first oral intake occurred earlier; and finally, the satisfaction of the patients and surgeons was higher. We encountered no complications.

		Total	GA	SA	P value
		n=100	n=50	n=50	
Gender	Female	50 (50%)	26 (52%)	24 (48%)	0.689
	Male	50 (50%)	24 (48%)	26 (52%)	
Mean age			52.2 ± 3.1	54.4 ± 2.8	0.047
BMI (kg/m2)	Min-Max		19,8-51,9	20,6-34,4	0.052
	Mean ± SD		29,15 ± 5,37	27,33 ± 3,69	0.052
ASA	ASA I	38 (38%)	20 (20%)	18 (18%)	
	ASA II	58 (58%)	28 (28%)	30 (30%)	0.004**
	ASA III	4 (4%)	2 (2%)	2 (2%)	

CONCLUSION: Based on our results, SA was reliable and clinically successful for lumbar microdiscectomy. When comparing it to GA for the same procedure, we found that SA is advantageous owing to its more favorable surgery start time, recovery time and cost. **Table 1**

Anahtar Kelimeler: anesthetic costs, general anesthesia, lumbar disc surgery, spinal anesthesia, time to return to work *Demographic parameters, BMI, and ASA scores*

Sözlü Bildiriler

OP-37

LATERAL INTERPEDICULAR AND LATERAL INTERPEDICULAR TRANSMUSCULAR APPROACH IN THE SURGICAL TREATMENT OF LUMBAR FAR LATERAL DISC HERNIATION

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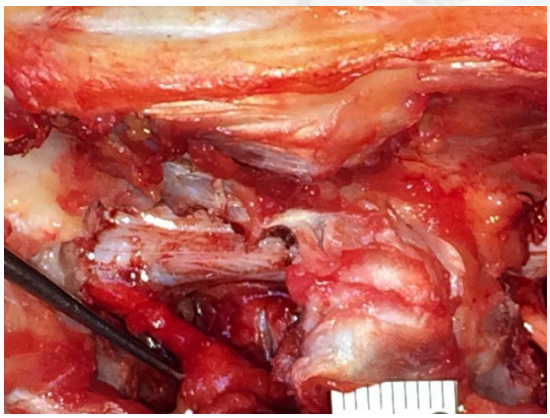
AIM: Far lateral lumbar disc herniations are rare disc pathologies, the disc material is located just lateral to the pedicle and causes the exiting root to be pinched. The lateral interpedicular approach and lateral interpedicular transmucular approach do not lead to instablity due to fewer bones are removed from the facet joints and pars interarticularis. The aim of this study was to retrospectively evaluate and compare the results of 21 patients operated with lateral interpedicular approach and 11 patients operated with lateral interpedicular transmuscular approach.

MATERIAL-METHODS: Our study included extruded or sequestered disc herniations causing radiculopathy and extending to the far lateral area and foramen. Both approaches were made with midline skin incision. In the lateral interpedicular approach, the thoracolumbar fascia was opened from the midline and while in the lateral interpedicular transmuscular approach was opened from the lateral side of the midline. Both approaches targeted the removing of sequestered or extruded disc fragment in the lateral compartment by exposing the exiting root lateral to the pars interarticularis.

RESULTS: In this study, 21 patients operated with lateral interpedicular approach and 11 patients operated with lateral interpedicular transmuscular approach between 2015-2018 were presented. Postoperative pain and satisfaction rate, duration of operation and bleeding during operation were determined by comparing two surgical methods. The mean age of the patients operated with lateral interpedincular approach was 46 years, and the mean age of the patients who operated with lateral interpedincular transmuscular approach was 39 years. 18 of the patients were male and 14 were female. There were disc pathology at the L2-3 level in 3 patients, L3-4 in 12 patients and L4-5 disc level in 17 patients. The mean operative time was 48 min in patients operated with lateral interpedincular approach and 72 min in patients operated with lateral interpedincular transmucular approach. The amount of bleeding was 90 cc in patients operated with lateral interpedicular approach, and 150 cc in patients operated with lateral interpedicular transmuscular approach. None of our patients developed root injury, CSF fistula, and hematoma in the operation site.

DISCUSSION: The lateral interpedicular approach and the lateral interpedicular transmuscular approach are easy to apply, safe, minimaly invasive techniques with short duration of operation and hospitalization, low complication rate for the surgical treatment of the far-lateral lateral disc herniations

Keywords: far lateral, exiting root, lateral interpedincular



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Sözlü Bildiriler

OP-38

CLINICAL OUTCOMES OF BILATERAL DECOMPRESSION VIA UNILATERAL APPROACH IN LUMBAR SPINAL STENOSIS

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AIM: Lumbar spinal stenosis is typically a degenerative condition that leads to compression of the spinal canal and lateral recess, resulting in leg pain and walking disability. Surgery must be applied on patients who do not respond to conservative treatment. Minimally invasive methods are increasing in number as the technology advances. One of these minimally invasive methods is the bilateral decompression via unilateral approach (BDUA). The aim of this study was to observe the clinical results of BDUA technique applied for lumbar spinal stenosis.

MATERIAL-METHODS: The data of 269 consecutive patients were analyzed retrospectively. Visual analogue scale (VAS) was used to evaluate low back and leg pain in preoperative and postoperative last visit. Postoperative complications were checked during the follow-up period.

RESULTS: A total of 269 cases underwent operation by using BDUA technique from July 2013 to May 2017. The mean age for the study group was 64.3±7.7 years and the ratio between male and female was 1:1.17; Mean follow-up of the study was 26± 3.7 months. The average VAS score improved from 7.3 ± 0.4 to 3.1 ± 0.5 ($P < 0.005$). The success rate was 88.7%. Intraoperative dural tear was found in 15 patients. 12 patients underwent revision surgery due to insufficient decompression or recurrent disc herniation.

CONCLUSION: BDUA technique obtain satisfactory long-term results in the treatment of lumbar spinal stenosis, with a lower incidence of complications and increases patient comfort in the postoperative period.

Keywords: Decompression, Lumbar stenosis, Unilateral approach

Figure 1

Pre-operative and post-operative sagittal and axial MRI.

Sözlü Bildiriler

OP-39

SAGITTAL SHAPE AND ALIGNMENT OF THE LUMBAR SPINE: ANOTHER FACTOR GOVERNING ADJACENT SEGMENT DEGENERATION

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PURPOSE: There is ongoing concern over the potential for adjacent segment disc degeneration (ASDD) in the long-term after fusion. ASDD appears to result from the combined effects of increased mechanical load due to the fusion itself, age, and genetic factors. The effect of sagittal alignment and shape has not been well investigated. We evaluated the association between individualized sagittal shape and alignment of the lumbar spine and ASDD in the long-term (mean 12.5 yr) after fusion or nonoperative care.

MATERIAL-METHODS: From patients who previously had participated in a randomized controlled trial (RCT) of lumbar fusion versus nonoperative care for chronic low-back pain (LBP); inclusion criteria for this study were being aged 25-55 yrs; candidate for fusion due to low-back pain of ≥1 year; and availability of standing lateral radiographs including femoral heads at long-term follow-up. Disc space height was measured for each lumbar segment using a validated computer-assisted distortion compensated roentgen analysis technique (Mannion et al, 2014). Relative Pelvic Version (Measured minus Ideal SS) and Relative Lumbar Lordosis (Measured minus Ideal LL) and the Lordosis Distribution Index (L4-S1/L1-S1 Lordosis) were used to calculate the Lumbar-GAP (Global Alignment and Proportion, Yilgor et al, 2017) Score, indicating sagittal shape and alignment. Differences between groups categorized as GAP-Proportioned, GAP-Moderately Disproportioned and GAP-Severely Disproportioned were analyzed using ANOVA.

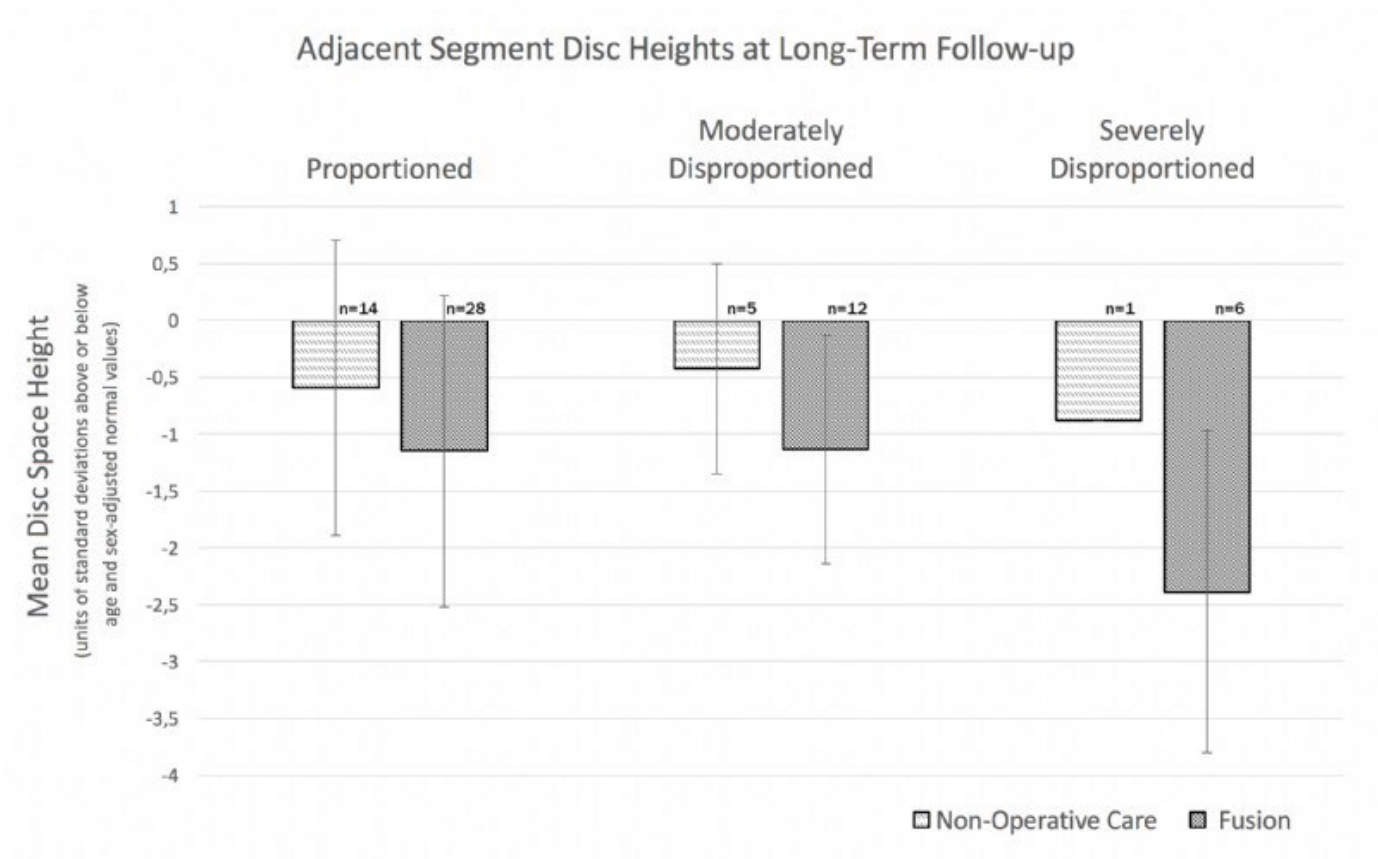
RESULTS: 68 patients (33F, 35M; 42.9 (SD7.8) yrs) with a mean follow-up of 12.5 (SD 1.7) years were included. Severely disproportioned patients showed significantly lower adjacent segment disc height than did moderately disproportioned or proportioned patients (Fig. 1). The effect appeared to be more marked in fusion than non-operative patients (formal subanalysis limited by sample size). Qualitatively similar findings were observed for the two levels above the adjacent level.

CONCLUSIONS: The individualized shape and alignment of the lumbar spine in patients with a degenerative disc may be an important determinant of the longer-term magnitude of disc height loss in the adjacent segment, especially in patients undergoing fusion.

Keywords: adjacent segment, low back pain, randomized controlled trial

Sözlü Bildiriler

Adjacent disc



Sözlü Bildiriler

OP-40

CLINICAL AND RADIOLOGICAL COMPARISON OF POSTEROLATERAL FUSION AND POSTERIOR INTERBODY FUSION TECHNIQUES FOR MULTILEVEL LUMBAR SPINAL STABILIZATION IN MANUAL WORKERS

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STUDY DESIGN: Eighty-four patients who had been treated for degenerative spinal diseases between January 2006 and June 2009 were reviewed retrospectively.

PURPOSE: We aimed to compare the clinical and radiologic findings of manual workers who underwent posterolateral fusion (PLF) or posterior interbody fusion (PLIF) involving fusion of 3 or more levels of the spine.

OVERVIEW OF LITERATURE: Previous studies have concluded that there is no significant difference between the clinical outcome of PLF and PLIF techniques.

METHODS: After standard decompression, 42 patients underwent PLF and the other 42 patients underwent PLIF. Radiologic findings, Oswestry disability index (ODI) scores, and visual analogue scale (VAS) scores were assessed preoperatively and at 6-month intervals postoperatively and return to work times/rates were assessed for 48 months.

RESULTS: Patients who underwent PLF had significantly shorter surgical time and less blood loss. According to the 48-month clinical results, ODI and VAS scores were reduced significantly in the two groups, but the PLIF group showed better results than the PLF group at the last follow-up. Return to work rate was 63% in the PLF group and 87% in the PLIF group. Union rates were found to be 81% and 89%, respectively, after 24 months ($p = 0.154$).

CONCLUSIONS: PLIF is a preferable technique with respect to stability and correction, but the result does not depend on only the fusion rates. Discectomy and fusion mass localization should be considered for achieving clinical success with the fusion technique. Before performing PLIF, the association of the long operative time and high blood loss with mortality and morbidity should be taken into consideration, particularly in the elderly and disabled patients.

Keywords: degenerative spine, disc disease, posterior interbody fusion, posterolateral fusion, spinal instabililty

Sözlü Bildiriler

OP-41

MINIMALLY İNVASIVE SOLUTIONS OF COMPLICATED DEGENERATIVE COMPRESSIVE LUMBAR SPINAL LESIONS

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AIM: This prospective observational study was undertaken for analysis of 1093 patients with 3025 levels of degenerative lumbar spinal stenosis with or without degenerative spondylolisthesis, one or two level disc herniation, and/or far lateral disc herniation who underwent bilateral decompression via a unilateral approach between 2000 and 2017. We have conducted a study to compare the initial chief complaint, neurological status and outcome of patients.

METHODS: 168 (15.3%) of 1093 patients underwent operation for lumbar stenosis associated with degenerative spondylolisthesis. Decompression was performed at more than 3 levels in 336 (30.7%) patients. 261 (23.8%) of 1093 patients underwent concomitant discectomies at the index level. All patients were followed-up regularly at intervals of 1, 6, 12 months, and were followed up annually thereafter. All patients underwent MR-imaging studies one year after surgery. Routine radiological investigations including neutral, flexion/extension lateral radiographs at these time intervals were taken routinely. Spinal canal size and (neutral and dynamic) slip percentages were measured both pre- and postoperatively. For clinical evaluations, Oswestry Disability Index (ODI), and Short Form–36 (SF-36) were used.

FINDINGS: Neutral and dynamic slip percentages did not significantly change after surgery ($p = 0.67$ and $p = 0.61$, respectively). The spinal canal was increased to 2,1–3.6-fold (mean 2.7 ± SD 0.3-fold) the preoperative size. The ODI scores decreased significantly in both the early and late follow-up evaluations, and good or excellent results were obtained in 934 cases (85.4%). The SF-36 scores demonstrated significant improvement in the late follow-up results ($p < 0.001$). Three patients (0.2%) required secondary fusion during the follow-up period.

CONCLUSION: Postoperative clinical improvement and radiological findings clearly demonstrated that the unilateral approach for treating complicated degenerative lumbar spinal lesions is a safe, effective, and real minimally invasive method in terms of reducing the need for stabilization.

Keywords: Minimally İnvasive Solutions, bilateral decompression via a unilateral approach, degenerative spondylolisthesis, far lateral disc herniation; complicated degenerative lumbar spinal lesion

Sözlü Bildiriler

OP-42

SPINAL VASCULAR MALFORMATIONS: A RETROSPECTIVE ANALYSIS OF 32 CASES

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INTRODUCTION: Spinal vascular malformations, consisting of arteriovenous fistulas (AVF) and malformations (AVM), are rare cases comprising 3-4% of spinal lesions. Their treatment options are surgery, endovascular procedures and combinations of both.

METHOD: 32 patients treated for spinal vascular malformations between 2003-2019 have been retrospectively reviewed. Type of the malformation, clinical and radiological features and treatment modalities have been reviewed.

RESULTS: 29 were male, only three female. Mean age was found to be 44. There were 21 AVF patients, while there was 12 AVM patients. One patient was diagnosed with both AVF and AVM. Main neurological symptom was motor and sensory deficits. 17 patients were treated with surgery, 20 patients were treated with embolization and 5 patients were operated after partial embolization. The follow up period ranged from three to 18 months. 15 patients had a 3 or 6 months spinal angiography for radiological follow up. Remainders were followed up with MRI. 2 patients had asymptomatic residual lesions. Following treatment, 4 patients had increased neurological symptoms. The rest of the patients' neurological examination remained stable or improved. One patient, who was first treated with surgery and then embolization, had wound complication 5 months after discharge. All patients with motor deficits were directed to physical therapy.

CONCLUSION: In case of unexplained spinal pain, neurologic deficit or hemorrhage or unexplained spinal cord edema on T2 MRI scans, spinal vascular malformations should be brought to mind. Either surgery or endovascular embolization can be appropriate for these patients. Our study was compatible with literature for treatment achievement percentages.

Keywords: arteriovenous fistula, arteriovenous malformation, spinal vascular malformations, spinal tumors, neurosurgery, neurointerventional radiology

Sözlü Bildiriler

OP-43

BILATERAL RAMUS COMMUNICANS NERVE PULSE RF FOR PAINFUL OSTEOPOROTIC THORACAL VERTEBRAL COMPRESSION FRACTURES

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INTRODUCTION: There are limited treatment options for patients with painful osteoporotic vertebral compression fracture in whom surgery is not indicated or when pain persists even after vertebroplasty. Conservative treatments generally do not provide adequate or prolonged pain relief since the pain is originated from surrounding vertebra. In this case series, the effectiveness of percutaneous ramus communicans nerve pulse RF was verified for the treatment of pain in patients with painful osteoporotic vertebral compression fracture.

METHODS: Fifteen patients in whom pulse RF on ramus communicans were performed for painful osteoporotic vertebra compression fracture after failure of conservative therapy or after percutaneous vertebroplasty were analyzed retrospectively. Bilateral nerve blocks were done with 3 mL 0.5% bupivacaine and 4 mg dexamethasone on the ramus communicans nerve under C-arm fluoroscopy guidance. Pulse RF technique was performed after successful pain relief which was defined as ≥ 50% reduction in the NRS scores. Analgesic consumption and procedural complications were also identified and pain scores were monitored for 6 months with one month intervals.

RESULTS: Significant initial pain relief was noted in all patients after the first procedure and pulse RF was performed one month after diagnostic nerve blocks. After the 6 month follow up, pulse RF was performed in 3 patients due to the increase in pain scores. Decreased analgesic consumption was documented in 12 of patients. There was no procedure related complication.

CONCLUSION: Bilateral ramus communicans nerve pulse RF for the treatment of painful osteoporotic thoracal vertebral compression fracture is effective and safe and may be considered as an useful adjuvant therapeutic option in the clinical settings.

Keywords: Osteoporosis, Thoracal Vertebral Compression Fractures, Ramus Communicans Nerve, Pulse RF

Sözlü Bildiriler

OP-44

CLINICAL OUTCOMES OF A SERIES OF 11 PATIENTS WITH SACRECTOMY

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PURPOSE: Among the tumors causing destruction in the spine, the management and treatment of the sacrum tumours are challenging because of their close proximity to the colorectal region. Following tumor excision lead to several complications associated with anatomical dead space and spinopelvic discontinuity. In this study, we retrospectively evaluated patients who underwent sacrectomy due to nonmetastatic sacrum tumor.

METHODS: Eleven patients who underwent sacrectomy due to nonmetastatic sacrum tumour in our hospital between 2011 and 2018 were included in the study. Demographical data, musculoskeletal tumor function score (MSTS) and pathological diagnoses of patients undergoing total + subtotal sacrectomy were examined. Complications were noted.

RESULTS: The mean age of the patients was 54.2 years (range 41-68 years). The mean follow-up period was 26 (4-80) months. Histopathologic examination revealed Chordoma in 8 patients, Chondrosarcoma in 2 patients and giant cell tumour in 1 patient. 6 patients underwent total sacrectomy and 5 patients underwent subtotal sacrectomy. Anatomic dead space was managed with local flap in 3 patients. Patients undergoing total sacrectomy underwent spinopelvic fixation (SPF) additionally to tumor excision. Two patients underwent debridement following total sacrectomy due to surgical site infection. One patient was operated due to iliac screw breakage. One patient was reoperated due to postoperative hematoma. Root injury developed in 3 patients following total sacrectomy. In the subtotal sacrectomy group, 1 patient had superficial skin infection and 1 patient had wound hematoma. The mean MSTS score was 17.5 in patients with total sacrectomy and 23 in subtotal sacrectomy.

CONCLUSION: Complications were more frequent in patients following total sacrectomy. Compared to patients undergoing subtotal sacrectomy, these patients may need recurrent surgeries and lower health related quality of life indices.

Keywords: Chordoma, Sacrum Tumor, Total Sacrectomy

Sözlü Bildiriler

OP-45

SURGICAL ADVANTAGES USING 3D - PATIENT SPECIFIC MODELS IN HIGH-ENERGY THORACOLUMBAR FRACTURE-DISLOCATION

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INTRODUCTION: Thoracolumbar fracture-dislocation is a high-energy trauma. The injuries are usually associated with paraplegia and requires surgical intervention to decompress the neural elements and restore the biomechanical stability of the spine. Traditionally, thoracolumbar fracture dislocation is treated with long-segment posterior fixation. The treatment of complex fractures remains one of the most challenging tasks that orthopaedic surgeons face of the complex anatomy, limited surgical access to the fracture sites and postoperative uncertainties. The aim of study was to describe the application of the life-size three dimensional (3D) patient-specific models with its anatomical details which were used for minimizing neurovascular risks of intraoperative traumatic patients.

METHODS: A total of 20 patients with thoracolumbar fracture-dislocation were divided into two equal groups as conventional surgery and 3D model-assisted surgery. Surgical and clinical outcomes was compared with two groups. After CT scans of the models were measured, the life-size patient-specific models were proven to be individualized. 3D models were assisted in determining the fracture location and pedicle sizes. The surgical and clinical outcome was measured in Frankel classification, operating time, Intraoperative blood loss, sagittal angle recover rate, success rate of pedicle screw entery point at horizontal position, sagittal screw inclined angle differances, and Visual Analog Scale score, the American Spinal Injury Association (ASIA) scale, Oswestry disability index, Immediate postoperative and final follow-up X-rays measure the kyphotic angle using Cobb's method.

RESULTS: Image post-processing time was approximately 7 h per model. Each model took approximately 10 h to print. The range of the measuremets for ideal point of entry reveals the need for patient spesific intervention was required. The landmarks for deciding the entry point for lateral mass screws were clarified by using life-size patient specific spine models. Patient-specific pre-surgical planning can be useful to respect the patient's anatomy, reduce surgical invasiveness and simplify the surgical procedure. 3D model-assisted group indicated significantly shorter operation time, less blood loss volume, shorter turnique time and fluoroscopy times, and better outcome than conventional one.

CONCLUSIONS: 3D models were used in surgical planning maximizing the possibility of ideal screw position as well as providing individualized information concerning thoracolumbal spinal anatomy. Life-size 3D model is effective and reliable in achieving an accurate and safety procedure during thoracolumbar fracture-dislocation surgery, especially in surgically complex cases. The individualized 3D printing screw insertion template was user-friendly and it enabled a radiation-free thoracolumbal screw insertion.

Keywords: Thoracolumbar fracture, 3D printing,Thoracolumbar dislocation

Sözlü Bildiriler

OP-46

SINGLE STAGE POSTERIOR TOTAL VERTEBRECTOMY (PVCR) AND CIRCUMFERENTIAL RECONSTRUCTION FOR UNSTABLE THORACAL/ THORACOLUMBAR(T/TL) BURST FRACTURES WITH/WITHOUT NEUROLOGICAL DEFICIT: CLINICAL, NEUROLOGICAL AND RADIOLOGICAL OUTCOMES

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INTRODUCTION: There is no consensus for the ideal surgical treatment of unstable T/TL burst fracture ± neurological deficit. The viable options include posterior instrumentation ± decompression, anterior or combined surgery. The goals of surgical treatment are to decompress neural structures, restore kyphotic deformity and maintain stabilization of the vertebral column. There is very limited information in the literature about PVCR technique for unstable T/TL burst fracture. The aim of this study is to evaluate the outcomes of PVCR technique for unstable T/TL burst fracture.

METHODS: 52 (34F,18M) patients treated with PVCR technique were reviewed. The surgical technique included segmental pedicle screw fixation at least 2 levels above and below, decompression of neural structures with PVCR, followed by placement of a titanium mesh or expandable cage for anterior column support. Preop, postop and latest f/up x-rays were evaluated for local kyphosis angle (LKA) and sagittal parameters. Neurological and functional statuses were assessed by ASIA Scale and Oswestry score.

RESULTS: Average age was 48.3 (22–83) years, average f/up was 68,9 (28-216) months. Fractures were Thoracal in 21 and TL in 31 patients. AOSpine TL Spine Injury morphologic types were; 5 Type A3, 22 Type A4, 5 Type B1, 6 Type B2, 14 Type C injuries. Average AOSpine TL Spine Injury score was 8.2(5-13). Resections were single level in 49 patients and two-levels in 3 patients. Titanium mesh was used in 25 and expandable cage was used in 27 patients. Average LKA improved from 33.3° to 5.1°. 13(%62) of the 21 patients with initial neurologic deficit(9 ASIA A, 2 ASIA B, 4 ASIA C, 6 ASIA D) showed at least one grade (ave. 1.76 grade) improvement on the final ASIA scale. Solid fusion was achieved in all patients.

CONCLUSION: Single stage PVCR provided complete spinal canal decompression, ideal kyphosis correction, restored anterior vertebral column and improved neurologic deficit at least one grade (ave 1.76 grade) in patients with neurologic deficit and eliminated morbidity of anterior or combined surgery.

Keywords: Burst Fracture, PVCR, Thoracal/Thoracolumbar

Sözlü Bildiriler

OP-47

UNILATERAL POSTERIOR SURGERY FOR OSTEOPOROTIC VERTEBRAE FRACTURES. MODIFIED POSTERIOR VERTEBRAL COLON RESECTION COMBINED WITH THE INSERTION OF AN EXPANDABLE CAGE: HOW SAFE AND EFFECTIVE IS THAT APPROACH FOR GERIATRIC POPULATION?

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INTRODUCTION: Osteoporotic vertebrae fractures leading to high rates of mortality and morbidity including deformity, pain and neurological deficit are mostly presented with vague complaints and are reported progressive if left untreated. Posterior only approaches are advised for the geriatric population with poor medical conditions, because of the avoidance of complications including implant related ones and increased morbidity related to anterior surgery. The aim of this study is to evaluate the efficacy and safety of subtotal posterior vertebral column resection (PVCR) combined with instrumentation for the elderly patients presenting with thoracic or thoracolumbar osteoporotic fractures with spinal cord compression and severe pain.

PATIENTS AND METHODS: 42 patients with at least 5 years of follow-up were included prospectively in the study. They underwent posterior instrumentation (unilateral costotransversectomy +hemilaminectomy) with modified PVCR combined with the insertion of an expandable titanium cage. Patients were evaluated clinically and radiographically evaluated.

RESULTS: 34 females and 8 males with a mean age of 74.3 (range 67-84) and follow-up duration of 92 months were included. The level of fracture was L1 in 7 patients, T12 in 9 patients, T11 in 4 patients, T8 in one patient and T9 in one patient. Mean duration of operations were detected as 220 minutes while patients were detected to have a mean loss of blood of 450cc. All of the patients were mobilized immediately after surgery. The mean pre-operative local kyphosis angle improved from 14.5° to 5.2° at the last follow-up ($p=0.003$). Patients pre-operative mean VAS score improved from 8.3 to 2.7 at the last follow-up ($p<0.001$). Patients pre-operative mean JOA scores improved from 11.3 to 16.62 at the last follow-up ($p<0.001$). The average SF-36 MCS/PCS at the last follow-up were noted as 56.33/56.09. Dural tear was detected intra-operatively in one patient and repaired immediately.3 patients developed distal junctional level fracture and underwent early vertebroplasty.2 patients were diagnosed with urinary tract infections and 3 developed respiratory problems resolved with conservative measures. One patient underwent revision due to cage subsidence.2 patients died after the last follow-up.

DISCUSSION AND CONCLUSION: Subtotal PVCR combined with the insertion of an expandable titanium cage was detected as a safe and effective method for osteoporotic vertebrae fractures involving spinal cord compression, by enabling the decompression of the spinal canal and reconstruction of the resected segment, while eliminating the need for anterior approach carrying high risks of significant morbidity in the elderly population and resulting in significant improvement in clinical and radiographic outcomes.

Keywords: Osteoporotic Vertebra Fracture, Geriatric Population, Posterior Vertebral Colon Resection, Unilateral Costotransversectomy + Hemilaminectom, Expandable Titanium Cage, Early Mobilization

Sözlü Bildiriler

OP-48

COMPARISON OF SF 36 AND SRS 22 SCORES OF SHORT-LEVEL (SELECTIVE) AND LONG-LEVEL (NONSELECTIVE) FUSION WITH POSTERIOR APPROACH IN LENKE TYPE 5C ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS

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The goal of the surgery of the Lenke 5C AIS is to provide the coronal and sagittal global balance of the spine while keeping the mobile segment as mobile as possible. Anterior or posterior selective (short level) fusion in Lenke 5C AIS is an important option with an increasing trend. It is aimed to compare short and long level fusion in terms of SF 36 and SRS-22 scores. 105 patients who met our studies criteria operated in Baltalimanı Bone Disease Training and Research Hospital Orthopedics and Traumatology Clinic between 2005-2016 were included. 47 patients had short-level fusion and 58 patients had long-level fusion. The preoperative and postoperative SRS-22 and SF 36 scores of the patients were compared. In the SRS-22 scoring, the total score including subcategory was not significantly different between the two groups. In SF36, the physical role subcategory of selective fusion cases was found to be significantly higher ($p < 0.05$). There were no significant differences in other parameters.

Keywords: adolescent idiopathic scoliosis, Lenke 5C, selective fusion, SF-36, SRS-22

Sözlü Bildiriler

OP-49

COMPARISON OF SHORT AND LONG SEGMENT INSTRUMENTATION WITH CLOSING WEDGE OSTEOTOMIES FOR THORACOLUMBAR KYPHOSIS SECONDARY TO ANKYLOSING SPONDYLITIS

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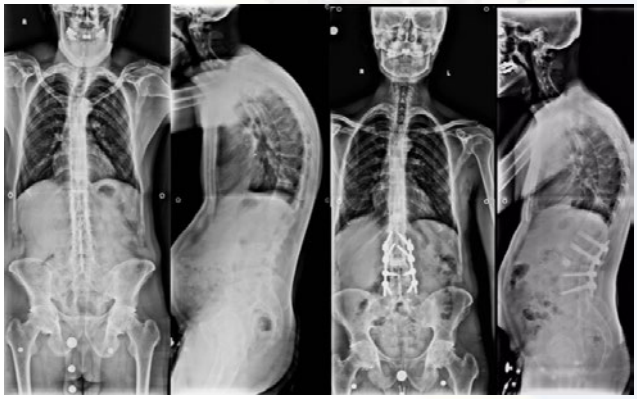
INTRODUCTION: Ankylosing spondylitis (AS) is a rheumatologic condition which commonly associated with thoracolumbar kyphotic deformity and sagittal imbalance. In the late stages of the deformity, usually the patient's looking straight ahead is disrupted and may need surgery to improve the quality of life. Several corrective spinal osteotomy techniques such as closing wedge osteotomy, polysegmental Smith- Peterson osteotomy and opening wedge osteotomy have been used to correct the kyphosis deformity. In this study, we aimed to compare the long and short segment instrumentation approaches after closing wedge osteotomy (CWO) on ankylosing spondylitis cases.

METHODS: A total of 34 AS patients were analyzed retrospectively. Twenty six patients with at least 2 years of follow-up were analyzed and divided into 2 groups according to the length of instrumentation. We defined short segment instrumentation group (SS) (n: 11) as construct length 4 levels (except the osteotomy level, 2 levels above and below of the osteotomy level) and long segment group (LS) (n: 15) as construct length higher than 4 levels. Two groups were compared radiographically. Radiographical measurements included thoracic kyphosis (TK), lumbar lordosis (LL), global kyphosis(GK), sagittal vertical axis (SVA) and osteotomized vertebra angle OVA). In addition, the amount of bleeding, the duration of surgery and the need for blood transfusions were compared.
RESULTS: Significant improvement of the SVA was achieved in both groups ($P < 0.05$). There was no statistical difference between the groups in terms of OVA, LL and TK. The average losses of blood were 1190 cc in SS group and 2240 cc in LS group and significantly different between the 2 groups. Need for blood transfusion and operation time means were significantly lower in SS group, respectively. Post junctional kyphosis was observed in 1 patient in LS group at the 2-year follow-up, and revision surgery was performed.

CONCLUSION: Both SS and LG instrumentations are safe and effective surgical methods for correction of thoracolumbar kyphosis in CWO-treated AS patients. SS can be more advantageous than the LG because of lesser blood loss and shorter surgical time.

Keywords: ankylosing spondylitis, closing wedge osteotomy, kyphosis, sagittal imbalance

L3 closing wedge osteotomy and short segment instrumentation



Sözlü Bildiriler

OP-50

DEFORMITY CORRECTION IN SEVERE ANKYLOSING SPONDYLITIS WITH COMBINED OSTEOTOMIES

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OBJECTIVE: To evaluate the effects of single level lumbar decancellation osteotomy in combination with multiple level polysegmental posterior osteotomies involving whole thoracal spine in severe ankylosing spondylitis. Summary of Background Data: İn severe ankylosing spondylitis current practice uses excessive single or two level lumbar and thoracolumbar junctional ostomies to correct deformity and chin-brow angle. These procedures need great angular correction at a single pivot point forcing the safe limits. İn this paper we report the results of our technique for gradual and safe correction of severe kyphotic deformity.

MATERIALS-METHODS: From 2008 to 2017 fourteen patients with secondary thoracic and thoracolumbar kyphosis due to ankylosing spondylitis included into the study. The indication for surgery was a progressive loss of horizontal sight because of whole spine kyphosis (chin-brow angle over 90 degrees). We included twelve male and two female patients into the study. The mean age at the time of operation was 47 (range 36 - 57) years. Preoperatively and postoperatively cobb was measured on standing lateral radiographs of the whole spine. Chin-brow angle correction recorded. Follow up periods ended at 24th month

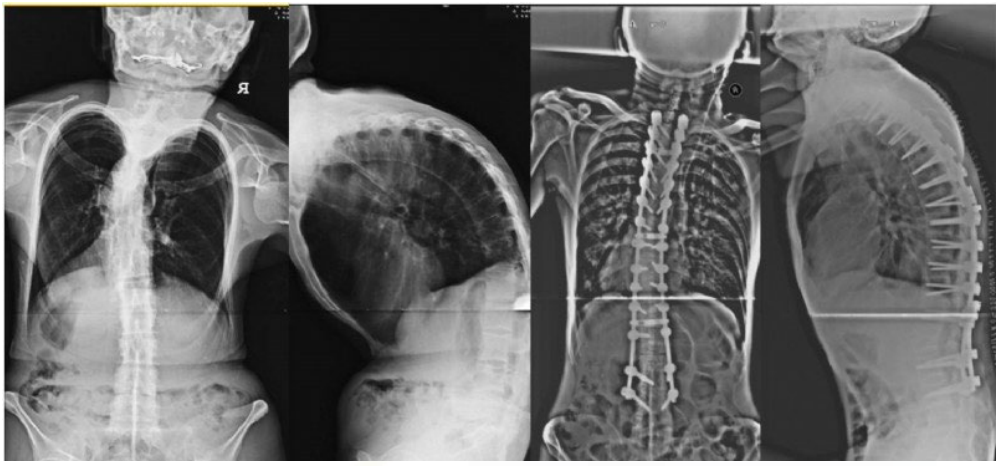
RESULTS: The mean surgical time was 281 minutes (range: 230 – 350) and average blood loss recorded as 1870 ml (range: 1200 – 3000). Preoperative mean chin- brow angle was 97.5 degrees (range: 91 – 107). Postoperative chin- brow angle was 18 degrees (range 7 – 30) ($P < 0.0001$). Preoperative mean thoracal Cobb angle was 69 degrees (range 58 – 95). Postoperative thoracal Cobb angle was 37.5 degrees (range 30 – 49) ($P < 0.0001$). Preoperative mean lumbarlordosis angle was -1.2 degrees (range -18 to 13). Postoperative mean lumbarlordosis angle was -29 degrees (range -42 to -20) ($P < 0.0001$).There were no major peri-operative and post-operative complications. Two patients had minor wound problems. Bone healing was satisfactory in all patients. Three patients had loss of correction in thoracal region 5, 7 and 8 degrees at the final follow-up visit. Reduction losses were acceptable, and we did not plan any revisions.

CONCLUSIONS: Global and gradual correction of kyphosis in anyklosing spondtlitis with our technique provided satisfactory correction without major vascular – neurologic complications. Our study showed that this method is as effective as two level lumbar osteotomies used in severe cases and a safer procedure. We also avoided hyperlordotic posture and corrected toracal kyphosis and gained a more natural sagittal curvature

Keywords: Deformity, Ankylosing Spondylitis, osteotomy

Sözlü Bildiriler

resim 1



Pre and post operative radiographs of patient no 3

Sözlü Bildiriler

OP-51

SURGERY OF SPINE DEFORMITY IN PEDIATRIC PATIENTS WITH PARALYTIC SCOLIOSIS CAUSED BY MYELOMENINGOCELE

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AIM: Myelomeningocele (MMC) is a serious congenital malformation which has a great impact on patients forward life. Scoliosis, kyphosis, and sacral agenesis (SA) are common spine deformities in patients with MMC. Paralytic deformities may develop before and after birth with MMC. The purpose of the present study was to evaluate outcome surgery of spine deformity in pediatric patient with paralytic scoliosis caused by MMC.

MATERIAL METHOD: We reviewed thirty spina bifida patients underwent spine deformity surgery during a 3 year period from 2015 to 2018. eight patients were in paralytic scoliosis caused by MMC. A chart review for demographic and clinical data was performed for all patients. All patients had urine cultures preoperatively and treated prophylactically with oral antibiotics. Preoperative and postoperative deformity angles were measured. X-rays of the spine, CT scans with multiplanar reconstruction, and MRI were performed for all patients in order to analyze spine deformity, plan the surgery, and detect associated spinal cord malformations.

RESULTS: Eight of the 30 patients operated were paralytic scoliosis caused by MMC patients. 4 Females 4 males patient. The mean age of the patients are 11.3 (3-19) at the time of operation. Mean last follow-up time 2 years. Three patients paraplegia, 2 patients paraparesis and 3 patients neurolojic status was intact. The mean scoliosis angle was 77.7° (range = 45 – 146°) preoperatively. Postoperatively, the mean scoliosis angle was 16.25° (range = 3 – 60°). One patient has lumbar hiperlordosis 98° and this patient postop lumbar lordosis was 50°. Other patients did not have hiperlordosis. Six patients underwent posterior instrumentation and fusion. Two patients underwent posterior instrumentation with sliding growing rod technique (SGRT). The patients' sitting balance improved compared to their preoperative status. 2 patient have superficial wound infection complication. Threated with antibiyotics.

CONCLUSION: Presence of a myelomeningocele was usually associated with greater involvement of the lumbar spine. Kyphosis and scoliosis were the most commonly associated spinal deformities. Kyphosis and scoliosis were the most commonly associated spinal deformities. Multi-centered studies have shown early diagnosis and treatment offer the best prognosis. Surgical treatment is a challenging procedure with a wide spectrum of complications in MMC patients. But can provide good correction of spinal deformity and pelvic obliquity, and improve the quality of life

Keywords: paralitic scoliosis, myelomeningocele, spina bifida

Sözlü Bildiriler

Figure 1

preop & postop views and Xrays

Sözlü Bildiriler

OP-52

IS ANTERIOR SURGERY AN ABSOLUTE NECESSITY IN ADOLESCENTS WITH SPINA BIFIDA WHO HAVE LONG SEGMENT POSTERIOR LAMINA DEFECT? SAFETY AND EFFICACY OF ALL POSTERIOR INSTRUMENTED FUSION

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AIM: Anterior spinal arthrodesis with/out instrumentation has long been standard of care in spina bifida (SB) scoliosis. The literature regarding posterior instrumented and fusion (PIF) with all pedicle screw construct (PSC) is lacking. The aim of this study is to report the results of scoliosis surgery in spina bifida (SB) patients with posterior lamina defects (PLD) who had isolated posterior instrumentation/fusion (PIF) with all PSC.

MATERIALS-METHOD: Twenty scoliotic patients (mean age 164±28 months) were included in the study. Patients who had two or more levels of posterior lamina defects and post-operative follow-up of at least two years were included (Figure 1). Pure kyphotic patients were excluded. Parameters including Cobb angles of main curve, pelvic tilt and sagittal measurements were recorded. Intraoperative data including surgical time and blood loss were noted. Complications were graded based on Clavien-Dindo classification.

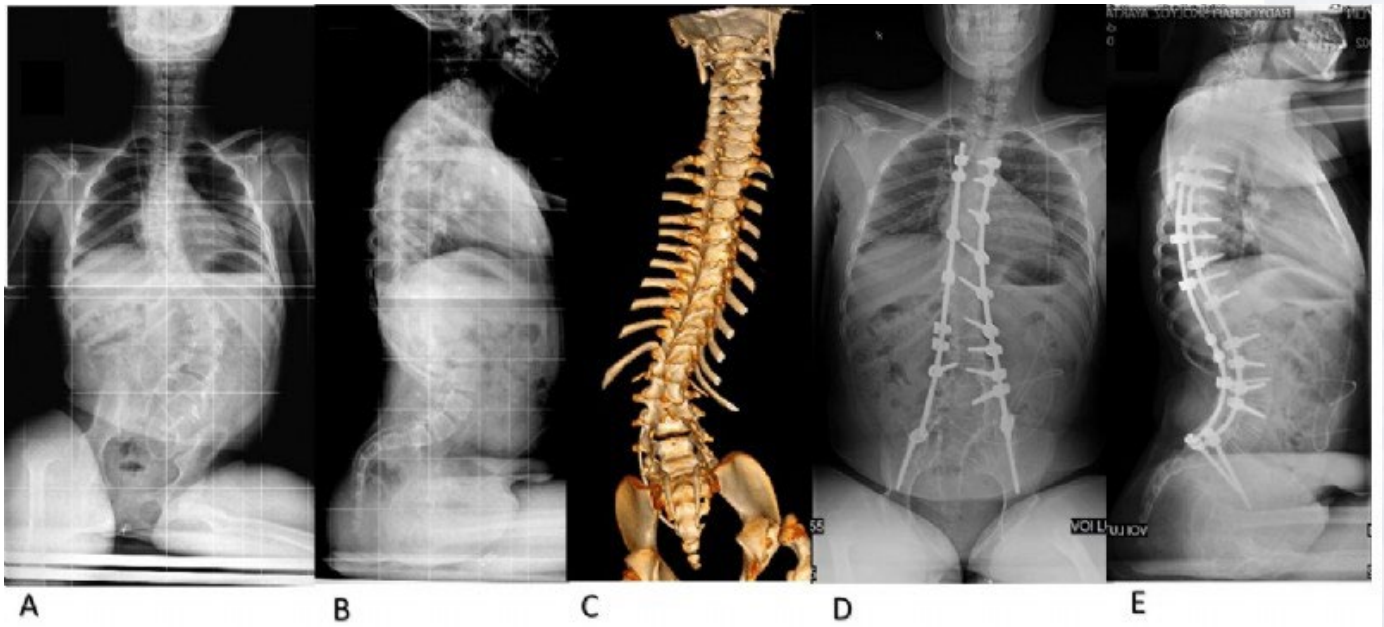
RESULTS: Ten out of 20 patients had thoracic level SB. The mean follow-up was 52±29 months. The mean number of spinal levels with posterior lamina defects was 4.7±2.2. Mean blood loss and operative time were 1558±933 ml and 346±47 minutes. There was significant difference in pre and post-operative Cobb angles of the main curve (pre 86°±26° and post 43°±28°, $p<0.05$) with 54±21% correction rate. Two patients (10%) had pseudarthrosis requiring revision. At least one complication was observed in 70% of the patients. Based on Clavien-Dindo classification, 3 patients had Grade 1, 4 had Grade 2, 11 had Grade 3 and 2 had Grade 4 complications. Five patients had infection, 3 deep infections that required debridement, 2 superficial infections managed with antibiotics only. Infection rate was significantly higher in non-ambulatory and thoracic level patients ($p<0.05$). Grade 3 complications comprised of implant failures(70%), deep infections(15%) and wound necrosis(15%). Implant failures were managed by revision instrumentation. Although grade 3 complications were higher in patients with ≥4 PLDs, thoracic level SB, non-ambulatory patients and in patients with pelvic instrumentation there was no statistical difference ($p>0.05$).

CONCLUSION: PIF is as effective as at least combined anterior and posterior fusion in terms of pseudarthrosis and infection rates. Anterior arthrodesis is not always necessary in all patients. Although the number of complications related to implant failures is high, most of them are easily manageable with simple interventions. New instrumentation strategies should be developed to reduce implant related complications.

Keywords: Lamina defect, Posterior instrumentation, Spina bifida

Sözlü Bildiriler

Figure 1



10 year-old patient with SB scoliosis. A and B, pre-operative anteroposterior and lateral radiographs, respectively. C, computed tomography scan reveals lamina defects in L4 to S3. D and E, all pedicle screw construct PIF was performed extending to pelvis.

Sözlü Bildiriler

OP-53

SURGERY OF SPINE DEFORMITY IN PEDIATRIC PATIENTS WITH CONGENITAL LUMBAR KYPHOSIS CAUSED BY MYELOMENINGOCELE

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AIM: Incidence of lumbar kyphosis in patients with myelomeningocele (MMC) ranges from 8 to 20%. It generally occurs within the thoracolumbar region, with kyphotic curves more than 80 degrees at birth. Angle of kyphosis progresses at 6 to 12° per year. The purpose of this study is to share our clinical experience on these particular patient group and discuss different surgical techniques which are defined in the literature.

PATIENTS AND METHODS: We retrospectively evaluated our database of patients with congenital lumbar kyphosis caused by MMC who underwent surgical procedures for spine deformities from 2014 to 2018. Our criteria for the patient selection were impaired truncal balance, progression of deformity angle, loss of sitting balance and cosmetic deformity. A chart review for demographic and clinical data was performed for all patients. Demographic and clinical data, surgical parameters, surgical techniques and levels, pre/postoperative deformity angles and complications were collated. Preoperative and postoperative deformity angles were measured.

RESULTS: There were 11 patients in the study. Seven patients were female and 4 patients were male. Mean age at initial surgery and last follow-up were 72 months (17 to 129mo) and 12.5 years (7.6 to 15.4 y), respectively, with a mean follow-up of 72.7 months (24 to 98mo). Preoperative lumbar local kyphosis angle varied between 50° and 128°, with an average of 92.8. Postoperatively, the lumbar lordosis angle was 15° (range = 0 – 32°). Posterior vertebral column resection was done for kyphotic vertebras. Sliding growing rod technique (SGRT) with long segment instrumentation was used in patients. The patients' sitting balance improved compared to their preoperative status.The spine growth was followed by sliding growing rod technique. One patient died due to bronchospasm on the second day after surgery. Fourteen unplanned surgeries occurred. Ten of these were implant revisions, 5 were irrigation and debridement procedures for 1 deep and 4 superficial infections. An additional 4 implant revisions were performed during regular lengthening procedures.

CONCLUSION: SGRT enables dynamic fixation in order to preserve growing potential of young spine and no need for subsequent lengthening operations, but further investigation to determine the exact subgroup of patients likely to benefit from SGRT is necessary before widespread usage of this approach.

Keywords: myelomeningocele, spina bifida, lumbar kyphosis

Figure 1 *preop & perop & postop views and Xrays*

Sözlü Bildiriler

OP-54

ARE WE RIGHT TO BE AFRAID OF NEUROMUSCULAR SPINAL DEFORMITY SURGERY? THE EFFECT OF TWO-ATTENDING SURGEON, CONSISTENT SURGICAL TEAM AND NOVEL İNTEGRATED ANESTHESIA APPROACH ON THE OUTCOMES

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OBJECTIVES: Neuromuscular spinal deformity mostly tends to be progressive in nature, proves a challenge to correct and treatment is further complicated by associated medical comorbidities caused by the underlying etiology. We investigated the effects of two attending surgeon, consistent surgical team and an integrated anesthesia approach on the safety and efficacy of surgical treatment in patients with low-tone neuromuscular scoliosis.

MATERIALS AND METHODS: Patients whom underwent scoliosis surgery at a single institution, in between 2008-2018 were retrospectively reviewed. Inclusion criteria; 1) Collapsing spine deformity with marked pelvic obliquity, 2) Underlying low tone neuromuscular disease [Duchenne muscular dystrophy (DMD), Spinal Muscular Atrophy (SMA) and Congenital Muscular Dystrophy (CMD] 3) Posterior all-pedicle screw instrumented fusion extending from upper thoracic region to pelvis 3) Schwab type 1 and type 2 osteotomy. In our institution, since 2014, spinal deformity surgery is performed by two attending surgeons working simultaneously collaborated with consistent surgical team (anesthetist, OR nurse, technician, neurophysiologist). We use a novel integrated anesthesia approach which include; 1) Persistent deliberated hypotension and high-dose antifibrinolytics during surgery to minimize blood loss, 2) Controlled fluid administraion to avoid hypervolemia and dilutional trombocytopenia in the perioperative course, 3) Wound infitration of local anesthetics and non-steroid antiinflammatory drugs instead of systemic opioids for postoperative analgesia. Patients operated between 2008-2014 (Group 1) and between 2014-2018 (Group 2) were grouped into two. Both groups were analyzed in terms of demographic and radiological parameters, duration of surgery, intraoperative bleeding, blood transfusion, intensive care unit (ICU) admission, complications and hospital stay.

RESULTS: There were 16 patients in Group 1 (3 DMD, 11 SMA, 2 CMD) and 17 patients in Group 2 (10 DMD, 3 SMA, 4 CMD). There was no significant difference between groups in terms of age, gender, body mass index, pre- and postoperative deformity magnitudes or number of osteotomy. Duration of surgery, intraoperative bleeding, blood transfusion, ICU admission and hospital stay were significantly lower in Group 2 (Table). There was no significant difference in intra- and postoperative complications between groups.

CONCLUSION: Complex spine deformity caused by underlying low tone neuromuscular disease can be safely and effectively managed with modern surgical techniques and anesthesia modalities. In addition, performing the surgery with two attending surgeon with consistent surgical team and using an integrated anesthesia approach offer to further reduce the morbidity and fasten the recovery of the patient.

Keywords: Congenital Muscular Dystrophy, Duchenne Muscular Dystrophy, Integrated Anesthesia Approach, Neuromuscular Scoliosis, Spinal Muscular Atrophy, Two attending surgeon

Sözlü Bildiriler

Table

	Group 1	Group 2	P Value
Age (years)	16.6 (13-24)	15.1 (12-19)	0,82
Sex (F/M)	9/7	5/12	-
Preop. Deformity Magnitude (°)	86° (55°-128°)	87° (60°-130°)	0,878
Postop. Deformity Magnitude (°)	27° (9°-47°)	29° (14°-56°)	0,781
# PCO's	3.7 (0-8)	3.9 (0-8)	0,657
Intraoperative Bleeding (ml)	1813 (980-2700)	1082 (300-2100)	0,001*
Operation Time (minutes)	297.1 (210-400)	241.3 (160-330)	0,006*
ICU Admission (%)	81.3% (13)	23.5% (4)	0,003*
Hospital Days	5.9 (5-13)	4.7 (4-6)	0,013*
Drainage (ml)	289 (100-550)	249 (70-600)	0,4
Intraop. Blood Transfusion (Units)	3.1 (2-5)	2.1 (1-5)	0,028*
Postop. Blood Transfusion (Units)	0.8 (0-2)	0.4 (0-2)	0,2

PCO: Posterior column osteotomy.

Sözlü Bildiriler

OP-55

IS THERE A RELATIONSHIP BETWEEN THE ETIOLOGY OF CORONAL PLAN DEFORMITY IN ADOLESCENTS AND THE EFFICACY OF POSTERIOR COLUMN OSTEOTOMY? IDIOPATHIC VS. NEUROMUSCULAR VS. CONGENITAL

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Posterior column osteotomy is a commonly used technique to increase curve flexibility in substantial spine deformity with either coronal or sagittal plane components. The aim of this study is to compare the safety and effectivity of PCO in scoliosis of congenital (CS), neuromuscular (NM) and adolescent idiopathic (AIS) origin.

METHODS: In our institution, patients underwent scoliosis surgery in between 2010 and 2015 were retrospectively analyzed. Inclusion criteria were; 1) Scoliosis >50 degrees, 2) AIS, CS or NM etiology, 3) ≥ 3 levels Schwab type 2 osteotomy, 4) Underwent posterior instrumented fusion and 5) >2 year follow-up. Exclusion criteria were; 1) Previous spinal surgery, 2) Pure sagittal plane deformity and 3) Concomitant anterior release and/or concave rib osteotomy. Patients were matched in terms of age at surgery, mean deformity magnitudes, type of instrumentation, number of fused levels and number of PCOs. Patients were grouped into three according to etiology. Radiological parameters, peri- and postoperative complications and neuromonitoring alerts were recorded. Flexibility of the main deformity was assessed with using traction radiograph under general anesthesia (TRUGA). The osteotomy effectivity was calculated with subtracting the correction obtained by TRUGA from the amount of final correction.

RESULTS: 111 patients were included (42 AIS, 32 CS and 37 NM). Flexibility of the main coronal deformity was significantly lower in the CS group as compared to both AIS and NM, but there was no difference between AIS and NM. In CS group, osteotomy effectivity was significantly higher than AIS group. (Table). The additional contribution PCO's to deformity correction on coronal plane was found to be minimal in AIS. There was no significant difference in sagittal plane correction among groups. There was no difference between groups in terms of neuromonitoring alerts during surgery and complications that require reoperation. No postoperative neurologic deficit was recorded.

CONCLUSION: Posterior column osteotomy is a safe and effective tool to improve coronal plane correction regardless of etiology. Most significant impact of PCO in deformity correction was recorded in CS group, although it has been known as a rigid deformity characterized by vertebral fusion anomalies. In AIS, aside from sagital plane issues such as thoracic hypokyphosis, PCO does not seem to be necessary to be routinely used in correction of coronal plane deformity.

Keywords: Posterior Column Osteotomy, Spinal Osteotomy, Scoliosis

Sözlü Bildiriler

Table

	CS	NM	AIS	P Overall	P CS/NM	P CS/AIS	P NM/AIS
Age (Years)	14	14.3	13.7	0.247	-	-	-
Preop Deformity Magnitude (°)	67	76.1	69.3	0.058	-	-	-
TRUGA Deformity Magnitude (°)	47.9	44.9	32.5	0.000	0.874	0.002	0.001
Postop Deformity Magnitude (°)	33.3	27.5	24.7	0.024	0.170	0.019	0.628
# Instrumented Levels	13	13.5	12.9	0.228	-	-	-
# PCO	3.7	4	3.5	0.204	-	-	-
Correction (%)	50	64	66	0.000	0.000	0.000	0.840
Curve Flexibility (%)	31	43	50	0.000	0.009	0.000	0.102
Osteotomy Effectivity (%)	41	34	24	0.020	0.465	0.016	0.213

Sözlü Bildiriler

Sözlü Bildiriler

OP-56

THE EVALUATION OF VERTEBROPLASTY USING EXTRAPEDICULAR PERCUTANEOUS VERTEBRAL CORPUS ACCESS TECHNIQUE FOR OSTEOPOROTIC VERTEBRAL FRACTURES

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INTRODUCTION: Percutaneous vertebroplasty through the transpedicular approach for osteoporotic vertebral compression fractures has several technical limitations and serious complications. The most difficult limitation of these is percutaneous approach to the upper or middle thoracic vertebra because of the small pedicle. One of the most feared complications of conventional vertebroplasty is inadvertent leakage of bone cement into the spinal canal and neural foramen. Most of these complications are closely related to the less viscous bone cement. Percutaneous vertebral body access (PVBA) technique through the posterolateral extrapedicular approach was recently developed to overcome those problems (Fig.1 and 2). It is possible the “low pressure-high viscosity” cement injection, because this procedure uses relatively large diameter cannula, which can make less serious cement leakage. Our purpose is to evaluate the efficacy of this procedure and analyse the surgical outcomes

METHODS: A retrospective review was performed in 210 levels of 179 patients who underwent percutaneous vertebroplasty utilizing posterolateral PVBA technique from June 2003 to December 2006. The average amount of the implanted cement was 1.5-3.0 mL in thoracic level (Fig.3) and 2.5-4.5 mL in lumbar level(Fig.4).

To determine the effects of this technique, we assessed postoperative radiological changes and clinical status. The principal outcome measure was an intensity of pain, assessed using a visual analogue scale (VAS).

RESULTS: The mean follow-up period was 127.6 days (range, 30 to 450 days). The mean age was 68.8 year old (range, 40 to 89) and female predominant (74%). The mean BMD score was - 2.91±0.83. The treated vertebrae varied from T5 to L5, but T12 and L1 occupied over 50% of all. The compression rate and kyphotic angle were slightly improved after procedure from 26% to 24% and from 9.0°±5.6 to 8.4°±5.8, respectively. Eight levels (3.8%) were aggravated the kyphotic angle over 5 degree after procedures. Preprocedural VAS was 8.26±1.08 decreasing to 1.7±1.16 ($p<0.01$). Postprocedural cement leakage was noted in 29 levels (13.8%). There was no case of leakage to epidural space or segmental artery injury.

CONCLUSIONS: Extrapedicular vertebroplasty utilizing posterolateral PVBA technique is a faster and safer procedure than conventional vertebroplasty even in middle thoracic vertebrae which have small pedicle size. More follow-up study is required to know the long term result of this new technique in the management of osteoporotic vertebral fractures. However, for appropriately selected cases, current data suggest that the complication rates are low and good results can be achieved.

Keywords: Vertebroplasty, osteoporotic vertebral fractures, middle thoracic vertebrae

Sözlü Bildiriler

OP-57

MID-LENGTH PEDICLE SCREWS IN POSTERIOR INSTRUMENTATION OF SCOLIOSIS

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Study Design Analysis of the measuremental data of 2846 pedicle screws which were inserted into the thoracal and lumbar vertebrae of 120 patients. Summary of Background Data Longer placement of pedicle screws provides improved resistance to pullout, cyclic loading and derotational forces. Engagement of anterior vertebral cortex enhances this resistance additionally. If anterior vertebral cortex engagement is intended, screws with 5 mm increments will jeopardize the visceral and vascular structures anterior to the anterior vertebral cortex.

OBJECTIVE: We investigated the necessitity of using mid-length pedicle screws (screws with 2.5 mm increments in length) during posterior spinal instrumentation.

METHODS: 120 patients who underwent posterior segmental instrumentation for structural scoliosis were recruited into this study and were prospectively evaluated. All pedicle screws were tried to be placed as long as possible. Main intention was at least to engage the subcortical bone of anterior vertebral cortex. Especially in the apical region the screws were tried to be inserted bicortically. Length, level, region and side of each screw was recorded. Screws with 5 mm increments were named as standart length screws (SLS), and middle size screws with 2.5 mm increments as mid-length screws (MLS).

RESULTS: A total of 2846 pedicle screws were inserted. 1575 (55.4 %) of these were SLS and 1271 (44.6 %) were MLS, showing that there is a need for MLS in scoliosis surgery ($p<0.05$). The need for MLS increased significantly thoracal region, apical vertebrae and convex side ($p<0.05$).

CONCLUSION: If anterior cortex engagement or longer placement of pedicle screws is intended in scoliosis surgery, for safer placement, screws with 2.5 mm increments should be available in posterior instrumentation systems.

Keywords: scoliosis, chord length, bicortical pedicle screw, mid-length screw

Sözlü Bildiriler

figure 1

Postoperative radiographs of 16 year-old girl. Lateral radiograph shows that the chord length was used effectively at every level.

Sözlü Bildiriler

OP-58

LUMBOSACRAL HEMIVERTEBRA RESECTION VIA POSTERIOR APPROACH: RADIOLOGICAL AND CLINICAL OUTCOMES IN THE MID-TERM FOLLOW UP. (MIN. 6 YEARS, MEAN 10 YEARS)

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INTRODUCTION: There is very limited information in the recent literature about lumbosacral hemivertebra resection via posterior approach. Due to anatomic difficulties posterior hemivertebrectomy is technically challenging at the lumbosacral spine. The coronal and sagittal decompensation and development of long compensatory thoracolumbar curve are main problems caused by lumbosacral hemivertebra. The aim of this study is to evaluate the mid-term clinical and radiological outcomes of the Posterior only lumbosacral hemivertebrectomy and short segment fusion technique via posterior approach.

METHODS: 9 (5F/4M) patients with congenital scoliosis due to lumbosacral hemivertebra were included. All patients underwent posterior hemivertebrectomy and short segment fusion with pedicle screw fixation. Mean age was 12,7 (6-28) years at the time of the surgery. The main curve, long compensatory curve and sagittal parameters were measured on preop, postop, f/up x-rays. SRS22r score was evaluated at f/up.

RESULTS: Mean f/up was 10 (6-16) years. The level of hemivertebra was L4 in 4 patients, L5 in 5 patients. The main curve of 31.2° was corrected to 3.8° and 5.4° at f/up with 83% correction rate. The long compensatory curve of 36.1° was corrected to 13.2° and 11.3° at f/up with 68% correction rate. Lumbar lordosis improved from -31.5° to -41.6° (32%). The gravity trunk shift was 23mm preop, 12mm postop, 9.8mm final f/up. Sagittal alignment was restored and maintained (mean f/up SVA:+19mm). There was no pseudoarthrosis, instrumentation failure or neurovascular complication. No additional surgery was performed. Mean SRS22r score was 4.1 at f/up.

CONCLUSION: Posterior only lumbosacral hemivertebrectomy and short segment fusion provided 83% correction of the main curve and 68% spontaneous correction of the long compensatory curve. Lumbar lordosis improved 32%. The corrections were maintained at the end of min. 6 years (mean 10 years) f/up. Although posterior lumbosacral hemivertebrectomy is technically challenging, posterior only approach avoids the morbidities of the anterior approach such as sexual dysfunction.

Keywords: Hemivertebrectomy, Lumbosacral, Posterior Approach

Sözlü Bildiriler

OP-59

THREE-DIMENSIONAL TITANIUM POWDER PRINTER & LAYERED PRODUCTION WITH LASER SINTERING FOR SPINAL IMPLANT PRODUCTION: THE BEGINNING OF AN AVANT-GARDE NEW ERA?

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Spinal titanium alloy implants are produced by machining process. This method permits the high quality implant production. Nevertheless, high energy consumption, limitations in production of micro, non-linear or moving parts and structures are the Achilles' heel (weak points) of this method. Three-dimensional printer technology is rapidly developing in the ultramodern world. It's advantageous because it can produce micro-sized and moving parts at once. Notwithstanding, the examples of this method have lower mechanical resistance than machining. In order to solve this problem, sintering at high temperature with green argon laser is attempted to increase the mechanical resistance.

In our study, we will compare two groups consisting of three screws which are 5,5X45 mm in size. So, one group will be produced with three-dimensional printer & laser sintering method, and the other group will be produced by traditional machining method, in addition we will compare these groups with the transverse compressive test results. The tests were conducted with Shimadzu device. The force was applied to the screws from the half of the its height perpendicularly with the speed of 5 mm/dk. Application area was 1 cm2. Afterwards, the mean value was used to compare. The transverse breaking limit of the machining-made screw group was 7200 N/cm2 and it was 6900 N/cm2 in the other group. There is no statistically meaningful significant difference. But also, the layered production group showed some plastic deformation but it was not broken like the other samples. This study showed that the mechanical resistance of the implants produced by the 3-D printer and laser sintering method was almost the same as the ones which are produced by the conventional method of machining. According to our deep investigations and knowledge about the Turkish literature; these number-one quality implants are the first prototypes of its kind in Turkey. They are also one of the earliest and well-crafted examples internationally. According to us, a new era has just started with the production of spine implants by three-dimensional titanium powder printer and laser sintering method. It is finally possible to produce micro or movable implants with high mechanical resistance at once.

Keywords: Spinal implant, three dimensional, titanium powder

Sözlü Bildiriler

OP-60

WHAT IS THE UNPLANNED SURGERY RATE AND REASONS IN EARLY ONSET SCOLIOSIS TREATED WITH MAGNETICALLY CONTROLED GROWTH RODS

Mustafa Celiktas, Levent Sener, Mahir Gulsen
Ozel Ortopedia Hastanesi, Adana

PURPOSE: The etiologies, curve types, and natural histories of Early-Onset Scoliosis (EOS) are different. The main treatment goals are to control deformities before exacerbation and without preventing spinal growth. Non fusion magnetic controlled growth rods (MCGR) are used for this reason. The main aim of MCGR is reduce the number of operations versus conversional non fusion techniques. The purposes of this paper investigate the number of operation and most common complication in patient who treated MCGR in our clinic.

METHOD: Thirty-one patients treated with MCGR in our clinic are included the study. Beside demographic data, etiologies and number of operations evaluated. All patients' rods are distracted magnetically in every 4 months. The amount of distraction for each noninvasive lengthening was 4mm before 02.2016 and 10mm after 02.2016. All distraction trials are noted. The number of unexpected operations and reasons for them evaluated.

RESULTS: Between 08.2012 and 06.2018 thirty-one patients were treated with MCGR. (19F-12M). Mean age was 7,23 (3-12). Seven of 31 patients were conversion patients whom treatment had begun with conversional growing rods and other 24 patients' primary treatment method was MCGR. Mean follow-up period was 48,97 (6-76) months. Mean number of magnetically distraction activation were 9,48 (1-19). Mean number of operation were 1,80 (1-6). Mean total lengthening amount was 60,64 mm according to remote control device. 20 patients were operated only one time eligibly to preoperative planning. But 11 patients had unplanned surgeries 2 or more times. 3 patients' MCGR treatments were finished due to unsolvable proximal implantation problems and 7 patients graduated with definitive surgeries. The most seen reoperation reason was thoracal (proximal) implantation problems

CONCLUSION: The main goal of MCGR treatments was operate the child only one time but it can't be achieved in all patients. Particularly proximal implantation failure problems and skin problems due to rods pressure were most common complications related to reoperation in our series. Our unplanned surgery rate is 35 % (11/31). Although this ratio seems to be high; the total number of surgeries is lesser versus traditional methods

Keywords: Magnetically Controled Growth Rods, Growing Spine, Early-Onset Scoliosis

Poster Bildiriler

Poster Bildiriler

PP-001

DECISION ANALYSIS IN QUEST OF THE IDEAL TREATMENT IN ADULT SPINAL DEFORMITY REVISITED

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AIM: Identification of the best treatment modality in ASD provides a challenge. Surgery (S) has been shown to yield better results compared to non-surgical methods (NS) by several studies using fixed MCID values for improvement or deterioration. Recent studies however, suggest that MCID values may vary significantly by the treatment modality.

METHODS: A total of 1452 patients (F: 1216, M: 236; S: 746, NS: 706) with a follow-up period of 2 years were analyzed. S group was further subcategorized into; no complication (N, n=1259), minor complications (Min, n=103) and major complications (Maj, n=90) groups to analyze the effect of complications on treatment results. MCID values for ODI were calculated by latent class analysis specific to ASD and its treatment (Overall: 14.31, S: 14.96, NS: 2.48), then the patient outcomes were categorized as improved (I), unchanged (U) and deteriorated (D). Utilities, as measures of the disease were calculated for each population (range: 0-worst- to 1-no burden-) and treatment modality based on VAS mapping. Finally, these data were incorporated into decision trees.

RESULTS: At the end of the 2nd year, 38.3% of S patients were I, 39.2% U, and 22.5% D whereas these values were 39.4%, 10.5%, 50.1%, respectively, for NS patients. S group were sensitive to complications with improvement rates of 40.1%, 39.3% and 33.3% and deterioration rates of 19.2%, 22.5% and 29.4% for N, Min and Maj, respectively. For utilities; S provided a higher value (0.583) than NS (0.549); hence, less burden (Figure 1). Utilities in S were sensitive to the presence of treatment complications, being 0.634, 0.564 and 0.497 in N, Min and Maj, respectively.

CONCLUSION: S has a less disease burden and a less chance of deterioration than NS, but equal chances for improvement at the end of the 2nd year. The effect of complications are clearly delineated.

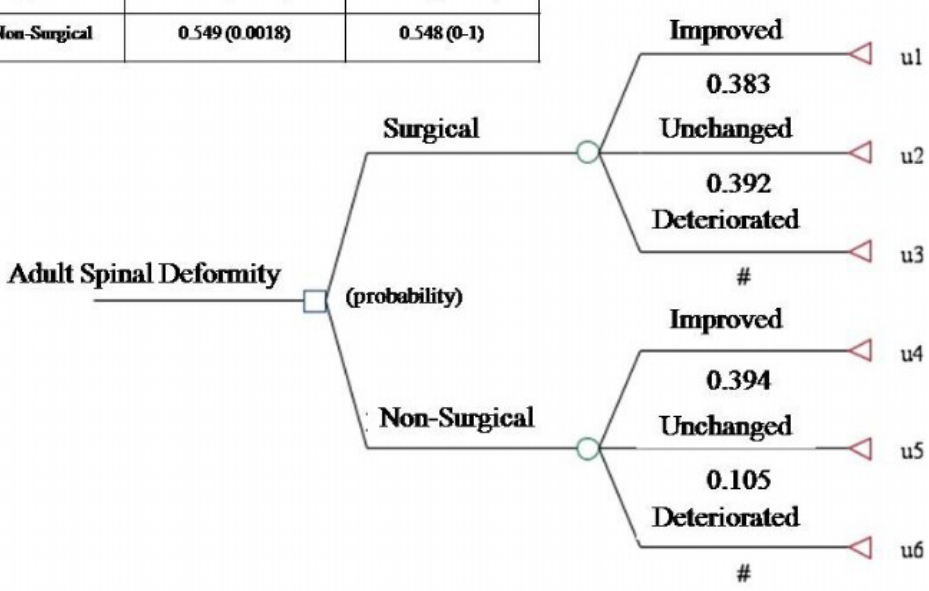
Keywords: adult spinal deformity, decision analysis, treatment, spinal curvatures

Poster Bildiriler

Figure 1

Figure 1. Utilities and probabilities of the treatment modalities including basic decision model without complications.

Overall Utility	Expected Value (SEM)	Median (Min-Max)
Surgical	0.583 (0.0015)	0.585 (0.029-1)
Non-Surgical	0.549 (0.0018)	0.548 (0-1)



u_i: the distribution of the (1-VAS) scores, e.g. u_1 is the distribution of the (1-VAS) score of the surgically treated and improved patients.

Utilities and probabilities of the treatment modalities including basic decision model without complications

Poster Bildiriler

PP-002

RELATIVE L4-S1 LORDOSIS: NEW PI-BASED PROPORTIONAL PARAMETER THAT AIDS THE INTERPRETATION OF THE DISTRIBUTION OF LUMBAR LORDOSIS

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PURPOSE: Through a horizontal line crossing the apex of the curve, lordosis can be reconstructed into 2 tangent arcs of circle as the upper and lower arc. The location of this apex changes based on PI and Roussouly shapes. The lower arc, by definition, is always equal to Sacral Slope (SS). However, loss of lumbar lordosis is the driver of the vast majority of sagittal plane deformities. The geometrical relation between lower arc lordosis and SS precludes lower arc lordosis from providing additional information in the setting of a degenerated spine. Relative Lumbar Lordosis (RLL) and Lordosis Distribution Index (LDI) are two of the four PI-based proportional parameters that comprise the GAP Score. RLL was described as 'measured minus ideal Lumbar Lordosis'. LDI was described as L4-S1 Lordosis/L1-S1 Lordosis x100. Aim was to define "ideal values" of L4-S1 Lordosis from its relationship with PI values using data from asymptomatic volunteers.

MATERIAL-METHODS: Three groups were divided by PI <40, 40-60 and >60 to represent different shapes. Distribution of L4-S1 Lordosis and LDI was plotted. Mean frequencies of LDI together with the formula for ideal LL (=0.62xPI+29) was used to predict the ideal L4-S1 lordosis. Anatomical Lower Arc Lordosis was calculated using the ideal SS formula (=0.59xPI+9) within the Relative Pelvic Version.

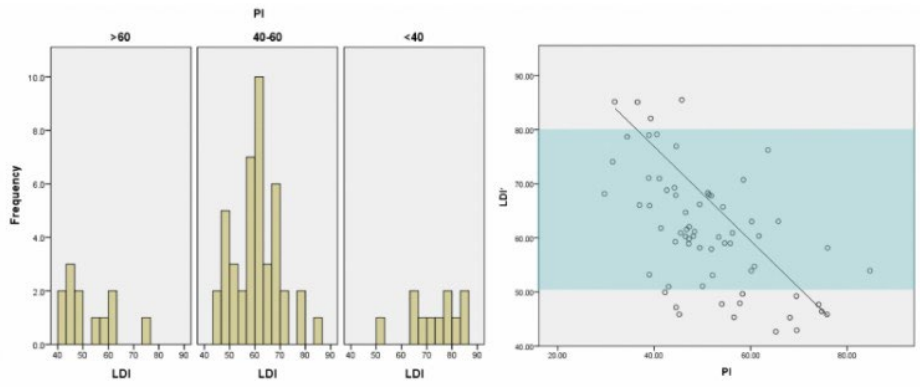
RESULTS: LDI was correlated with PI ($p<0.05$), while L4-S1 lordosis was not ($p>0.05$). Mean LDI were different in PI groups ($p<0.05$). Calculation of Ideal L4-S1 lordosis resulted in a 3-phased incremental prediction. Predicted L4-S1 and measured real L4-S1 lordosis displayed significant correlation ($p<0.05$).

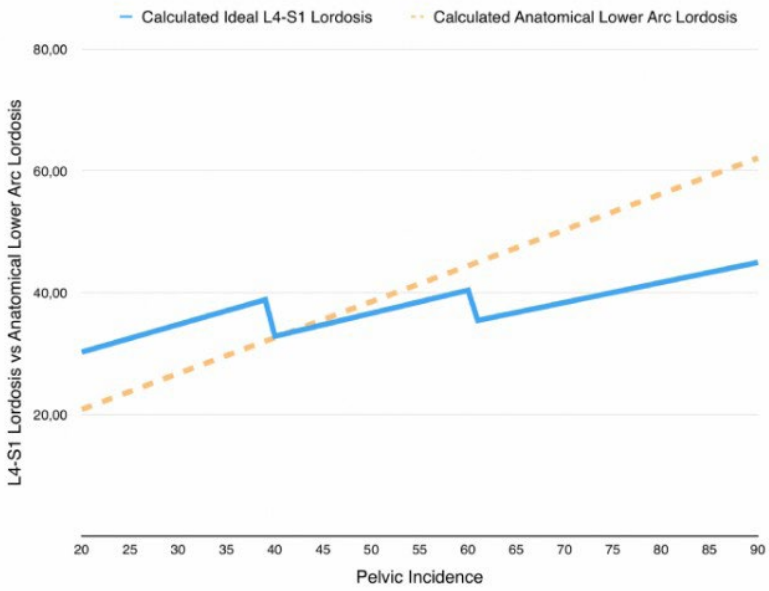
CONCLUSIONS: Lordosis, should be quantified as the amount of lordosis in regards to one's ideal in proportion to pelvic incidence (i.e. Relative Lumbar Lordosis), plus the amount of lower arc lordosis in regards to the total lordosis (i.e. Lordosis Distribution Index). L4-S1 lordosis, on normative data, can consistently be predicted. The magnitude of L4-S1 Cobb in relation to the magnitude of anatomical lower arc lordosis depends on the positions of L4 and the apex of lordosis in regards to one another. The use of Relative L4-S1 Lordosis (Measured minus Ideal L4-S1 Lordosis) may aid the interpretation of the Distribution of Lumbar Lordosis for treatment planning in the setting of pathology.

Keywords: lordosis distribution, lower arc lordosis, normative data

Poster Bildiriler

L4-S1 lordosis





Poster Bildiriler

PP-003

FORCED DECISION TREE CLASSIFIER FOR DETERMINING WIDESPREAD ACTING FEATURES AFFECTING MECHANICAL COMPLICATIONS

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PURPOSE: Patients with adult spinal deformity differ widely in their individual characteristics and clinical presentation, and risk factors associated with mechanical complications are multifactorial and plentiful (>60 have been suggested). AI-based decision trees can be used to identify subgroups possessing a particular risk factor. By repeatedly dividing the cohort into subgroups, decision trees cover both classification and regression. Impurity (having traces of one subgroup in another), entropy (degree of randomness of factors) and information gain guide the selection of features at each step for maximum accuracy. In doing so, a decision tree identifies numerous classification factors, although some are relevant only for a small group of patients. However, there must be a trade-off between accuracy and performance, since in the real world dividing data into pure classes is often not feasible.

MATERIAL-METHODS: 163 features derived from history, demographic, radiographic, technique-related and PROM data were included to predict mechanical complications: PJK/PJF, DJK/DJF, rod and implant-related. T-tests were performed to rank the features in order of significance. A hierarchical forced decision tree was performed, in which the feature splitting each branch of a step was forced to be the same by averaging the ranks. The number of steps was limited to 5, to provide a parsimonious set of risk factors related to the occurrence or otherwise of a mechanical complication, for the whole cohort.

RESULTS: 457 patients (362F, 95M, 53±19 yrs) with ≥4-level fusion, and a mean follow-up of 39.3 (24-94) months were included. Sagittal plane quantified by the postoperative GAP Score was the most important feature. Forced decision trees in GAP-Proportioned (175), GAP-Moderately Disproportioned (152) and GAP-Severely Disproportioned (130) groups revealed sacroiliac fixation, age, BMI and the number of comorbidities to be the most relevant and widespread acting features, in the given order.

CONCLUSIONS: Using data from an adult spinal deformity database, including 457 patients with ≥2 years' follow-up after surgery, and a 43.8% complication rate, an artificial intelligence (AI) based "forced" decision tree was created, in which the feature splitting each branch of a given step was forced to be the same. Although more important factors that affect a specific group of patients might exist, 5 factors were identified in this study that are relevant for the whole cohort. The postoperative GAP Score, sacroiliac fixation, age, BMI and number of comorbidities were the most relevant and widespread acting factors affecting mechanical complications for the whole cohort.

Keywords: machine learning, adult spinal deformity, GAP score

Poster Bildiriler

PP-004

COMPARISON OF THE RESULTS FROM NEW NON-FLUOROSCOPY ASSISTED SACROLIAC INJECTION TECHNIQUE TO FLOROUSCOPY ASSISTED INJECTION

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The necessity of use of fluoroscopy always causes problems for applicability of injection procedures of pain treatment. Besides, the dose of x-ray one is exposed to is always one of the biggest disadvantages that are discussed in terms of such injections. The purpose of this study is to define a technique without using fluoroscopy that could be operated within polyclinical conditions and to compare its results to the fluoroscopy assisted intraarticular injections. 203 patients that came to our polyclinic due to sacroiliac pain provisional diagnosis, that were not diagnosed with lumbosacral and hip pathology and did not respond to the conservative treatment were included in the study. The fluoroscopy assisted sacroiliac injected operated with the classical method on 40 individuals that applied firstly. The patients were randomized in accordance with the ranking of their applications. Injection was operated on the successive second 40 patients by using landmarks that were determined in the posterior. But, the placement of the injection was controlled with the fluoroscopy before the administration. On the 123 patients that made up the last group, the non-fluoroscopy injection in the polyclinical conditions With all patients, the pain assessment was carried out in the control of the 30th minute, the first week and the first month before intervention and after intervention with the visual analogue scale (VAS) and the results were statistically analyzed. These patient groups were compared to each other according to their VAS scores. Accordingly, it was observed that there is a significant different in the decrease of complains of the patients that were operated through fluoroscopy guidance in the 30th minute VAS scores ($p < 0.05$). However, no significant difference was encountered between the groups in the controls of the first and the first month. ($p>0.05$). In the fluoroscopic evaluation of the patients in the second group, it was determined that the injection of 33 (82.5%) patients was intraarticular injection, 5 (12.5%) patients were injected at a maximum of 5 mm medial and 2 (5%) patients were injected at a maximum of 5 mm lateral. In this study, it was observed that both intraarticular and periarticular sacroiliac joint injections caused similar decrease in the pain in all groups. In addition to this, that 82.5% of interventions, which were operated blindly by using the landmarks, are within the joint showed that disuse of fluoroscopy for such interventions does not make a significant contribution to the result.

Keywords: Sacroiliac injection, periarticular, sacroiliac pain

Poster Bildiriler

PP-005

NEGLECTED SACROILIAC JOINT FRACTURE AND DISLOCATION

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BACKGROUND: Sacroiliac joint disruption (SJD) is a common cause of pelvic ring instability. The treatment of the sacroiliac joint (SIJ) vertical instability is a matter of current discussions and remains controversial. Minimally invasive plate-screw internal fixation and sacroiliac joint screw fixation in the treatment of posterior pelvic ring fracture are current treatment methods.

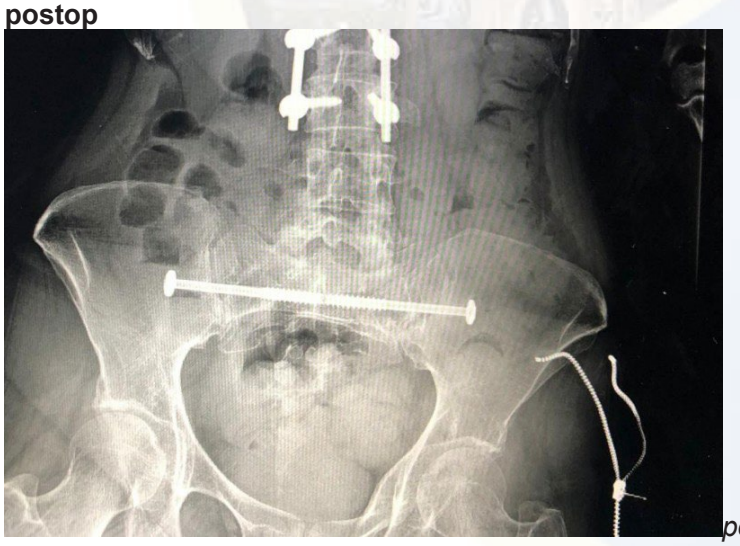
CASE: 40 years woman had fallen 3rd floor two years ago. She was operated by the neurosurgery and applied posterior lombar stabilization for L4 vertebra fracture. She took intensive care treatment after lumbar surgery for 1 weeks. She had pelvic area pain and It was thought that the pelvic area pain was originating from the lumbar fracture. The patient was given medical treatment for pelvic pain. The patient was consulted to orthopeadic surgery after 3 weeks. The patient was diagnosed by orthopeadic surgeon with right sacroiliac joint dislocation, left sacrum fracture and urinary incontinans.

MATERIALS AND METHODS: We applied bilateral percutaneous cannulated screws with scaly for pelvic injury. The duration of surgery was 20 minutes. We used scopy intraoperatively and shoted 43 times. We did not have any complications during and after the surgery. Pelvic pain and urinary incontinans was eliminated after surgery. She has been following for 1 year and has not any complaints.

CONCLUSION: Urinary incontinans can be caused by the sacrum fracture or sacroiliac instability and can be eliminated after biomechanical stability. Our result suggest that the stabilization of sacroiliac joint dislocation and sacrum fracture with percutaneous cannulated screw is a valid and feasible method and has low complication rate.

Keywords: sacoiliac joint, fracture, dislocation

postop



postop one year later

Poster Bildiriler

PP-006

SAKROILIAC JOINT PAIN AFTER LOMBER AND LUMBOSACRAL FUSION OPERATION

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INTRODUCTION: Pain caused by the adjacent sacroiliac joint located in the distal part, in fusion operations in the lumbar region, especially when involved in the stabilization in the sacrum, is one of the reasons for failed back surgery. In this study, our aim is to determine the frequency of sacroiliac joint pain in our patients undergoing lumbar and lumbosacral stabilization and to evaluate the effect of sacroiliac joint pain and body mass index, the surface area and shape of the sacroiliac joint on sacroiliac joint pain.

MATERIALS-METHODS: In our study, we included 72 patients with a complaint of sacroiliac joint pain who were called to control, of 177 patients who underwent lumbar and lumbosacral stabilization operation at Alanya Alaaddin Keykubat University Training and Research Hospital between 2015-2018. Age, gender, body mass index (BMI) of all patients were noted. Patients with the following conditions were diagnosed with sacroiliac joint pain (according to diagnostic criteria of Murakami et al.). 3D-CT was taken in patients to determine the surface area and shape of the sacroiliac joint. Types of sacroiliac joints were classified according to the morphological calcification of the sacroiliac joint.

RESULTS: 72 patients who underwent lumbar and lumbosacral stabilization were evaluated. Pain was detected in the sacroiliac region in 4 of the 51 patients who underwent lumbar stabilization. Of 21 patients with fusion in the sacrum, 12 had a complaint of pain, of whom 7 had in the right sacroiliac joint and and 5 had in the left sacroiliac joints. It was determined that sacroiliac pain of the patients was associated with whether the sacrum was involved in stabilization or not (<0.05). A positive correlation was determined between BMI and sacroiliac joint pain of the patients (<0.05). The relationship was detected between surface area of the sacrum and sacroiliac joint pain (<0.05). The relationship was determined between the group with type 3 of the sacroiliac joint and sacroiliac joint pain (< 0,05). No relationship was detected between the lumbar operations in which the sacrum did not involve in the fusion and the type of the sacroiliac joint, the surface area of the sacroiliac joint and BMI (>0,05).

CONCLUSION: The type of the sacroiliac joint, the surface area of the sacroiliac joint, pre-operative determination of BMI is important for avoiding sacroiliac joint pain and for planning the operation.

Keywords: lumbar and lumbosacral fusion, sacroiliac joint pain, sacroiliac joint shape, sacroiliac joint surface area, body mass index,

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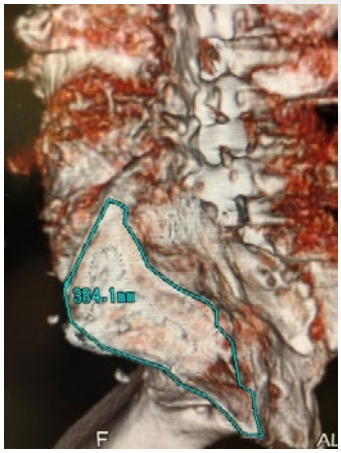

3D-CT was taken in patients to determine the surface area and shape of the sacroiliac joint

Poster Bildiriler

PP-007

WHICH SPINAL PROBLEMS CAN BE COLVE WITH POSTERIOR VERTEBRAL COLUMN RESECTION ?

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PURPOSE: The purpose of this study was to present our experience in patients who had been treated with posterior vertebral column resection (PVCR) for various spinal deformities. Even though it is difficult to treat the spine problems with advanced curvature, different correction techniques are used in the treatment. PVCR is a method used to correct different spinal deformities.

MATERIAL and METHODS: We retrospectively evaluated 31 patients (19 female, 12 male) who developed severe spinal deformity due to different reasons and were corrected by PVCR method after 2015 in our department. Mean follow-up period was 24 months (range 12-50 months). In this sturdy the demographic data of the patients, mean blood loss, amount of blood replacement, duration of operation, intensive care and hospital stay, PVCR level, instrumentation level, amount of preop curvature, amount of postop curvature improvement, preop and postoperative neurological status and complications were examined. Angular measurements were performed directly on the radiograph.

RESULTS: The mean age of the patients was 44 years (range 3-80 years). PVCR was applied to patients included in the study due to 10 different pathologies. These pathologies included post-traumatic kyphosis in 3 patients, tumor in 7, infection in 5, congenital kyphosis in 4, congenital scoliosis in 4, post surgical DJK in 1, postsurgical PJK in 1, POTT in 2, revision scoliosis, progressive severe scheuermann kyphosis in 2. PVCR was performed in 17 patients with thoracal, 12 in lumbar and 2 in thoracolumbar region with an average of 11 levels (range 3-18). The mean operative time was 461 min, while the mean blood loss was 2000 cc. Patients were given an average of 3 units of blood replacement. The mean hospital stay was 10 days (range 3-21). Postoperative angular measurements of postoperative radiographs showed an average of 55 degrees in the sagittal plane and 75 degrees in the coronal plane. One patient had incomplete neurologic deficit before the operation and became complete after surgery. There was no deterioration in the postoperative neurological status of the other patients. During surgery, 1 patient had bleeding and 2 had dural injury. Postoperative deep wound infection occurred in 5 patients. All the complications were controlled with an appropriate approach.

CONCLUSION: PVCR is an effective method for correcting severe spinal deformities and can be used to correct curvature in different patient groups.

Keywords: correcting, kyphosis, posterior vertebral column resection, PVCR, spine,

Poster Bildiriler

PP-008

IMPORTANCE OF NEUROMONITORING DURING PATIENT POSITION. A CASE REPORT

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Private MedicalPark Ankara Hospital

A 12-year-old girl had previously undergone corpectomy and short segment stabilization for congenital thoracic scoliosis. Due to instrument displacement and progression to kyphosis, she was operated with deformity surgery with an intention to perform long segment stabilization. She had minimal paresis prior to surgery. After she was anesthesized in supine position MEP (motor evoked potentials) and SEP (sensorial evoked potentials) were taken. After she was taken to prone position, control SEP and MEP values were taken, which were found to be bilaterally lost. After anesthesia-related causes (hypotension, effect of muscle relaxants) were eliminated, the neck was manually brought to traction. After waiting for 10 minutes, MEP and SEP values returned. A crutchfield cap was put and brought to traction with a 3-kg weight, and the operation was continued. The values remained unchanged during surgery. No postoperative neurological deficit occurred, and the pre-existing paraparesia improved.

CONCLUSION: neuromonitorization is important during patient positioning. An undiagnosed disruption of spinal supply or position-dependent compression may lead to irreversible injury.

Keywords: kyphosis, neurmonitoring, patient position

Poster Bildiriler

P009

FLEXIBLE POSTERIOR VERTEBRAL TETHERING FOR THE MANAGEMENT OF SCHEUERMANN'S KYPHOSIS: A NOVEL TECHNIQUE

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INTRODUCTION: Patients with Scheuermann's kyphosis (SK) having excruciating pain and progressive curvature (>70°) after failure of conservative treatment were managed surgically. Fusion as the gold standard surgical modality was undertaken, while causing permanent iatrogenic stiffening of the corrected segments leading to problems in context of spine biomechanics and patient's ability to mobilization. Vertebral body tethering as a growth modulating surgical option is gaining popularity to correct scoliosis in skeletally immature patients while sparing normal vertebral motion.

PATIENTS AND METHODS: The patient was 14 years old male with thoracic Cobb angle of 81°. An excruciating pain with failed conservative treatment of at least a year was noted. After the evaluation of the X-rays and detection of vertebral body wedging together with end-plate irregularities a diagnosis of SK was established. After counselling the patient and his family, that this was an off-label use of the device and may yield to additional future surgeries including fusion, a consensus was established to proceed with PVT.

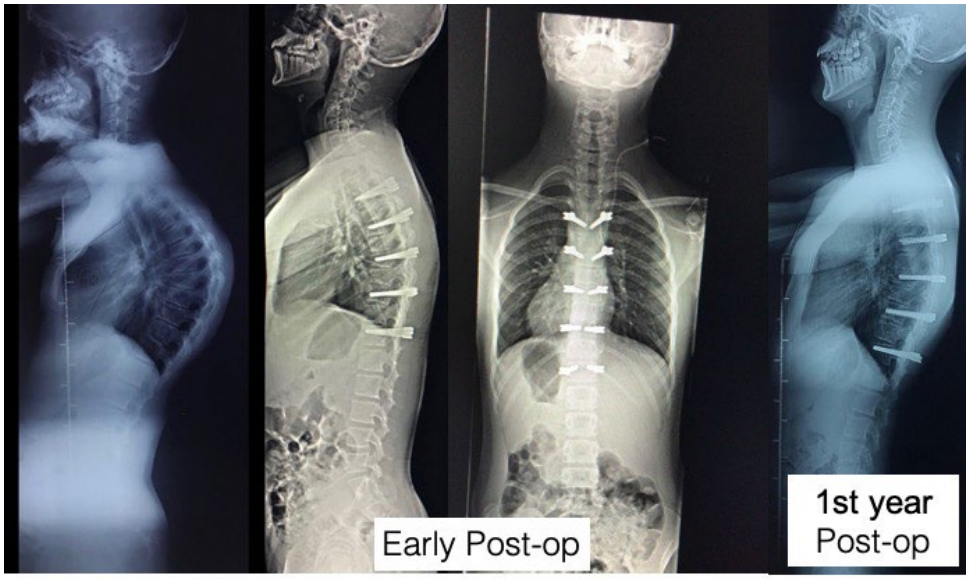
SURGICAL TECHNIQUE AND RESULTS: Wiltze approach was utilized at the level of T4-T12. By using the Zimmer Dynesis system (Zimmer Spine), pedicle screws of a diameter of 6.5mm were placed on either side at the levels of T4-T6-T8-T10 and T12. The tethering cord was then introduced and applied to screws. After sufficient tethering and achievement of aimed degree of correction and establishment of sagittal balance, set screws were placed on the tether at each level and secured together at each level. Before finalizing the surgery, the coronal balance was checked as well, while no disruption was detected. A correction of 43° of kyphosis was detected immediately after the surgery (Pre-operative: 81°, Post-operative: 38°). Patient was followed up for a year. At the latest follow-up appointment, the sagittal Cobb angle was measured as 35°.

CONCLUSION: We hypothesized that PVT could induce a growth arrest on the posterior portion of vertebral growth plates by compression, while it may induce growth on the anterior portion of the growth plates by distraction, leading to the correction of the kyphotic deformity. It was observed, that the vertebral wedging associated with the pathogenesis of Scheuermann's kyphosis and kyphosis itself improved over time, resulting in a correct sagittal alignment without any disruption of the coronal balance. Hereby we underlined the safety and efficacy of posterior vertebral tethering for Scheuermann's kyphosis in an adolescent patient with skeletal immaturity.

Keywords: Scheuermann's kyphosis, Posterior Vertebral Tethering, Growth Modulation, Fusionless Treatment, Heuter-Volkmann's Law

Poster Bildiriler

The case with Scheuermann's kyphosis who underwent Posterior Vertebral Tethering



Pre-op, Early Post-op and 1st year Post-op Standing X-rays of the patients

Poster Bildiriler

PP-010

EVALUATION OF TITANIUM RELEASE FROM TITANIUM ALLOY IMPLANTS IN PATIENTS UNDERWENT SPINAL INSTRUMENTATION SURGERY

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Evaluation of the titanium release of the titanium coated implants with the patients who were operated spinal instrumentation.

At the Uludağ University College of Medicine, patients had been examined spinal instrumentation for the spinal fusion less than five levels between January 2013 and January 2016 were involved in this study. The patients were diagnosed with spinal stenosis, spondylolisthesis and vertebrae fracture were evaluated. A control group was created by choosing people who had not undergone implant surgery previously. A study group of totally 50 people, that including 39 (78%) patients (Group I) and 11 (22%) people (Group II) formed as the study group and control group consecutively.In Group I 21 (42%) men and 18 (36%) women of the patients who were involved. In Group II 7 (14%) men and 4 (8%) women were chosen. In Group I the average age was 53.8 and in Group II average age was 59.2. When the average ages of two groups were compared; no significantly difference was detected (p=0.089). Titanium values were 0.048 (0.023-0.067) µg/L and 0.020 (0.000-0.020) µg/L respectively in Group I and Group II. The value of titanium release in Group I was significantly different from Group II (p <0.005). 15 (38.4%) patients were defined as early period and 24 (61.4%) patients were defined as late period. Early and late titanium values were 0.0546 µg/L (0.0424-0.0698) and 0.0423 (0.0213-0.0523) µg/L respectively. There was no significant difference between early and late period (p = 0.093). In patients with single-level or multi-level instrumentation, the titanium releases were determined as 0.0398 (0.0281-0.0563) µg/L and 0.0453 (0.0342-0.0698) µg / L respectively and no significant difference was found between the different levels of spinal instrumentation (p= 0.09). In Group I, 33 (84.6%) patients were underwent spinal fusion surgery due to degenerative spinal disease; 6 (15.4%) of the patients were underwent spinal fusion surgery due to vertebrae fracture. 16 (40.8%) patients were underwent posterolateral fusion and posterior instrumented, 6 (15.3%) patients were underwent only posterior instrumentation. One level cage for 13 (33.3%) patients, two levels cage for 2 (5.1%) patients and three level cage for 2 (5.1%) patients were implemented. In conclusion; titanium release occurs with the patients who underwent spinal fusion as microgram. The value of titanium in the blood could chose evaluation of spinal fusion in the clinical practice.

Keywords: spinal fusion, titanium, corrosion

Poster Bildiriler

PP-011

LAMINOPLASTY WITH MINIPLATES FOR THE SURGICAL TREATMENT OF SPINAL CANAL PATHOLOGIES

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BACKGROUND-AIM: Laminectomy procedures were traditionally performed in intraspinal lesion surgeries. However, laminoplasty technique has also been started to be performed routinely in recent years.In the present study, we aimed to evaluate the patients who underwent laminoplasty due to the pathologies that are located in the spinal canal.

METHODS: The records of the patients who underwent osteoplastic laminoplasty for various pathologies between 2012-2018 were retrospectively reviewed.

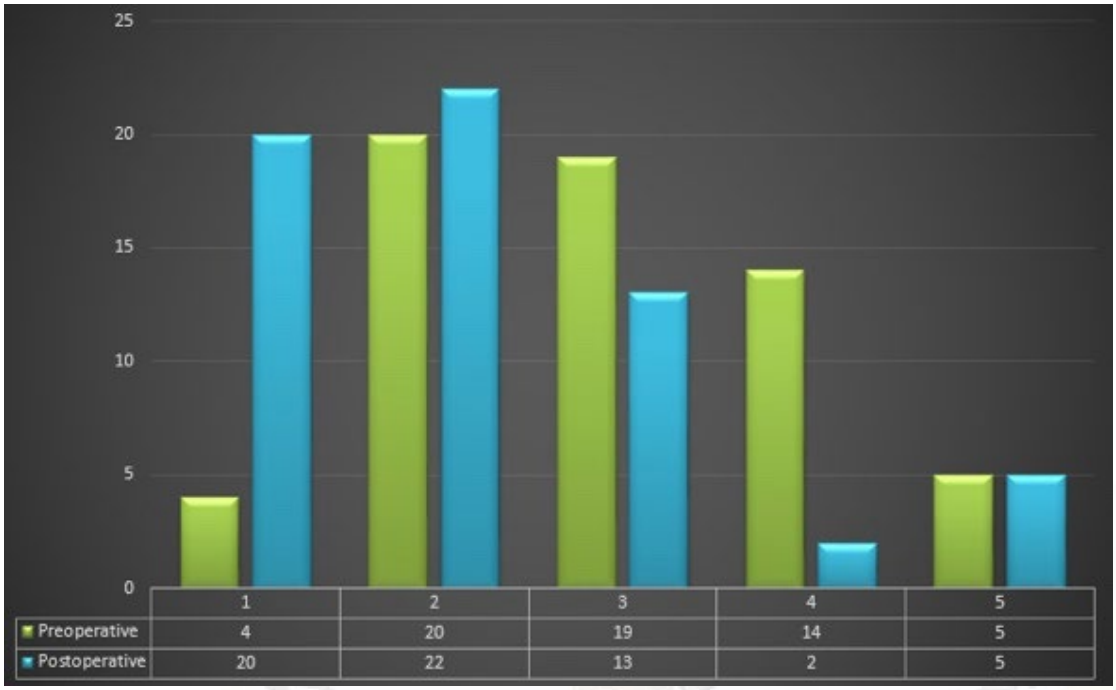
RESULTS: Sixty-two patients were included in the study. The mean age of the patients was 44.3 (9-80 years interval). 37 patients (59.6%) were female and 25 patients (40.4%) were male. Fifty-two patients had tumoral and 10 patients had non-tumoral pathologies. Of these 10 patients, 3 had arteriovenous malformation, 3 had cavernous malformation, 3 had spinal abscess and 1 had arachnoid cyst. In the tumoral group, 14 patients had schwannoma, 13 patients had ependymoma, 12 patients had meningioma, 5 patients had astrocytoma, 3 patients had lipomatosis, 2 patients had metastasis, 1 patient had hemangioendothelioma, 1 patient had primitive neuroectodermal tumor and 1 patient had epidermoid tumor. Grade 3 and 4 patients were predominant in the preoperative period, while grade 1 and 2 patients were predominant in the postoperative period according to Modified McCormick Scale classification of the patients (Figure 1). Thirty-five patients had intradural-extramedullary, 21 patients had intramedullary and 6 patients had extradural pathologies according to their neuroimaging. Spinal localizations of the pathologies were; cervical in 4 patients, cervicothoracal in 1 patient, thoracal in 32 patients, thoracolumbar in 6 patients and lumbar in 19 patients. Twenty-three patients had preoperative deformity according to their neuroimaging. A total of 138 laminae were reconstructed.A maximum of 5 segment laminoplasty was performed. Nine patients underwent 1 segment, 37 patients underwent 2 segments, 10 patients underwent 3 segments, 5 patients underwent 4 segments and 1 patient underwent 5 segment laminoplasty. One patient had cerebrospinal fluid leak in the long term period and 1 patient had quadriplegia and respiratory deficiency in the postoperative period. In terms of the development of postoperative deformity, only 1 patient developed new-onset deformity and 1 patient had progression of previous deformity. However, the deformities of these patients did not reach the limits requiring surgery. The mean duration of hospitalization was 3.6 days (2-64 days interval).

CONCLUSION: Laminoplasty technique has recently become widespread and begun to replace traditional laminectomy technique. Laminoplasty is a prominent technique with the low complication rates and high patient comfort in the postoperative period.

Keywords: Laminoplasty, spinal tumor, spinal deformity, cerebrospinal fluid leak

Poster Bildiriler

Figure 1



Distribution of the patients' preoperative and postoperative neurological conditions according to Modified McCormick Scale.

Poster Bildiriler

PP-012

SURGERY OF SPINE DEFORMITY IN PEDIATRIC PATIENTS WITH SACRAL AGENESIS CAUSED BY MYELOMENINGOCELE

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AIM: Sacral agenesis is a congenital condition that affects the osteology of the spine and is commonly associated with myelomeningocele (spina bifida) and paraplegia below the site of spinal malformation, congenital musculoskeletal deformities and varying degrees of sensory and motor deficits.The aim of study is to share our clinical experience surgery with sacral agenesis caused by MMC who had been treated for spinal deformity.

MATERIAL METHOD: We reviewed thirty spina bifida patients underwent spine deformity surgery during a 3 year period from 2015 to 2018. Five patients have spine deformity with sacral agenesis caused MMC. Our criteria for the patient selection were impaired truncal balance, progression of deformity angle, loss of sitting balance and cosmetic deformity. A chart review for demographic and clinical data was performed for all patients. All patients had urine cultures preoperatively and treated prophylactically with oral antibiotics. Preoperative and postoperative deformity angles were measured. X-rays of the spine, CT scans with multiplanar reconstruction, and MRI were performed for all patients in order to analyze spine deformity, plan the surgery, and detect associated spinal cord malformations.

RESULTS: Five of the 30 patients operated were with sacral agenesis caused by MMC patients.3 patient has kyphoscoliosis 2 patients have lumbar kyphosis. One of the patients was female, four of them were male. The mean age of the patients were 6,8 years (5-11years). Mean last follow-up time 2years. The mean scoliosis angle was 109.8° (range = 82–160°) preoperatively. Postoperatively, the mean scoliosis angle was 51,2° (range = 39–72°). Corpectomy was performed in 2 patients. T2-iliac posterior instrumentation was performed in 2 patients. T3- iliac posterior instrumentation was performed in 2 patients. T4- iliac posterior instrumentation was performed in one patient. Four patients underwent sliding growing rod technique (SGRT). The patients' sitting balance improved compared to their preoperative status. Only one patients has postop superficial wound infection complication.

CONCLUSION: Spinal deformity in children with MMC has been considered to cause severe disability. As reported in the literature, these were severe and complicated patients. The main importance of sacral agenesis from the aspect of deformity surgery is necessity of iliopelvic fixation. It is important to determine the type of sacral agenesis preoperatively and decide the design of instrumentation. Surgical treatment is a challenging procedure with a wide spectrum of complications in MMC patients. But can provide good correction of spinal deformity and pelvic obliquity, and improve the quality of life.

Keywords: sacral agenesis, myelomeningocele, spina bifida

Figure 1 *preop & postop views and Xrays*

Poster Bildiriler

PP-013

INVESTIGATION OF DYNAMIC FORAMINAL STENOSIS BY DYNAMIC MRI IN PATIENTS WITH C5-6 DISC HERNIATION

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PURPOSE: Evaluate the dynamic spinal stenosis with flexion- extension cervical MRI in patients that have minimal posterior bulging on C5-6 level.

METHOD: In 21 patients with radiculopathic symptoms in our clinic who had C5-6 minimal posterior bulging on cervical MRI, flexion and extension dynamic cervical MRI was performed and changes in both foraminal area and anterior posterior canal diameter were measured.

RESULTS: Mean age was 43.9 (28-66) 11 male, 11 female totally 21 patients. Mean foraminal area was 72.78 mm², in right side and 70.97 mm² in left side with conventional MRI. In flexion right FA was 73.14 mm², left FA was 71.63 mm², in extension right FA was 74.76 mm², left FA was 74.72 mm². The mean anterio-posterior canal distance of C5-6 level was 11.12 mm in normal position, 11.3 mm in flexion, 10.6 mm in extension. There is no significant change in all parameters.

CONCLUSION: Dynamic MRI can be used to investigate dynamic cervical spinal stenosis in patients with radiculopathic symptoms and minimal bulging in conventional MRI.

Keywords: dynamic, cervical, stenosis, MRI

Poster Bildiriler

PP-014

THE 50 MOST CITED TURKISH SPINE ARTICLES

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PURPOSE: The number of citations of an article is a marker of its academic influence. Several medical specialties and their subspecilalities, including spine, have ranked the articles with more citations. We identified the 50 most cited spine articles from Turkey and analyzed the characteristics that made them citable.

METHODS: Science Citation Index Expanded was searched for citations of articles originated in Turkey, published in any of the journals in the category “SPINE” from 1975 to 2019.We created a list ranking the 50 most commonly cited articles and determined the citation density (Citations/years since publication). Information noted for each article included authors, year of publication, source journal, article type, and field of research.

RESULTS: According to search criterias between 1975 and 2019; 2653 spine article had been produced by Turkish authors. The top 50 most cited articles had between 41 and 178 citations (mean,65,4); the citation density ranged from 1.83 to 10.1 citations/years (mean, 4.47). Thearticles were published in 28 journals all were published in English. Most articles (n =40) were published in 2000 or later. The majority were clinical articles (n = 42), and the most common fields were spine infection (n=10) and degenerative conditions (n =23).

CONCLUSIONS: This top 50 list displays articles that have become important references for the spine scientific community. Researchers may use this work to make their future publications more influential on future investigators.

Keywords: Spine Literature, Cited Articles, Turkish Spine

Poster Bildiriler

PP-015

RETROSPECTIVE STUDY OF ESTABLISHING SAFE SURGICAL BOUNDRIES FOR C2 VERTEBRA PEDICULE SCREW PLACEMENT

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OBJECTIVE: In this study, it was aimed to determine the feasibility and safe surgical margin of the technique by evaluating the patient's preoperative measurements for transpedicular instrumentation of C2.

MATERIALS-METHODS: 66 patients who underwent C2 transpedicular screw fixation between 2010 - 2017 at Ankara Numune Neurosurgery Clinic, were retrospectively examined for the accessibility of clinical records and radiological images. Bilateral anatomic distance measurements were made, the cases were divided into 4 subtypes according to their anatomical characteristics and the obtained results were evaluated statistically.

RESULTS: According to anatomical measurements, C2 vertebra types were found to be 68,9% Type 1, 3,8% Type 2,16,7% Type 3 and 10,6% Type 4. The "safe screw entry surface area" was calculated by multiplying the horizontal and vertical pedicle measurements and found to be the largest in Type 1 and the smallest in Type 2. Compared with pedicle widths (PW), Type 2 and Type 4 were found to be significantly narrower.The largest medial angle (MA) was in Type 2 and the narrowest angle was in Type 4; In the sagittal plane (SP), the widest angle Type 4 and the narrowest angle Type 3. When compared with measurements between vertebral foramen and midline (VFMM), the longest distance was found in Type 1 and the shortest distance was found in Type 4. A total of 132 C2 transpedicular screws were examined for vertebral foramen involvement in all the cases included in the study. When all three planes of cervical CT (coronal, sagittal and axial images) examined,12 cases (18,1%) that involve vertebral foramen, were determined. In 1 (8,3%) of these cases, it was determined that the screw caused vertebral artery injury. It was found that the transpedicular screw did not cause vertebral artery injury if the screw had any partial placement to pedicle at any of cervical CT axial, sagittal,coronal images. However, it was observed that if these pedicles did not touch the pedicles in three of these planes, it could cause vertebral artery damage.

CONCLUSION: For patients with transpedicular instrumentation planned for C2 vertebra, cervical CT images should be planned on three planes (axial, sagittal and coronal) Alternative instrumentation techniques should be preferred in cases of relatively high risk for vertebral artery injury, such as the presence of a high-positioned vertebral artery, both horizontal and vertical pedicle distances are less than 4.5mm (Type 2 vertebra) or pedicle width less than 4mm.

Keywords: Transpedicular screw, C2 vertebra,Vertebral arter injury

Poster Bildiriler

PP-016

LOCAL ANESTHETIC AND STEROID INJECTIONS FOR SPONDYLOLYSIS

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INTRODUCTION: Spondylolysis is a lysis in the part of pars interarticularis. The prevalence of spondylolysis is approximately 6%. The Low back pain is the most common symptom in the isthmic lysis. The second most common symptom is radicular pain. Although these patients are performed conservative treatments, a small number of patients can need to surgical procedures. In this report, we presented two cases with bilateral isthmic lumbar spondylolysis that were treated without surgery.

CASE-1: A 34 year old woman was admitted to outpatient clinic with complaining low back, and left leg pain for 1 year. In patient's history, she described a fall from tree 1 year ago. In examination no neurological deficit was found. We performed to her lumbal magnetic resonans imaging (MRI) and we seen that she had bilateral L5 isthmic spondylolysis. After that, we performed lumbar computed tomography due to her trauma story and findings were similar to her MRI. We decided to perform conservative treatment because of this patient had no neurological sign. We performed injection by with steroid and local anesthetic combination to her bilateral isthmic defect. Also, caudal epidural steroid and local anesthetic injection were achieved at some session. Patient was recommended to she use a corset for a month after this treatment. She has no symptom or neurological sign for 3 months.

CASE-2: A 64 age old woman patient was complained from low back pain for 2 years. She couldn't sit for a long time due to pain and no neurological deficit founded. We performed her lumbal MRI and bilateral L5 isthmic spondylolysis was detected. We performed an injection by use a steroid and local anesthetic combination to her bilateral isthmic defect. We recommended her that a corset use for a month. She has no symptom or neurological sign for 6 months.

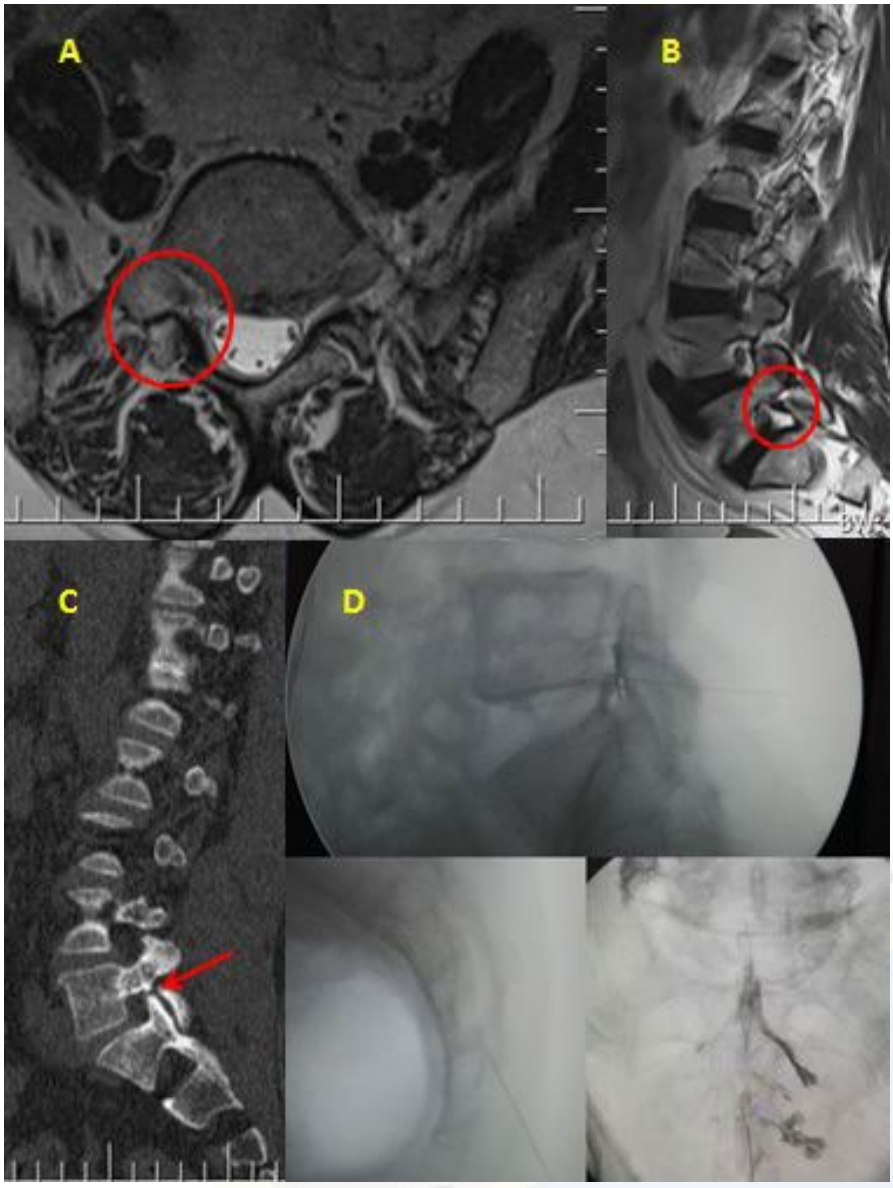
METHODS: We used 1 cc triamcinolone acetonide and 1 cc bupivacaine hydrochloride for per isthmic defect. Also, we used 1 cc triamcinolone acetonide, 2 cc prilocaine HCl, 3 cc bupivacaine HCl and 14 cc 0,09 % NaCl combination for caudal epidural injection.

CONCLUSION: Treatment of patients with spondylolysis must be decided as individually, according to age, symptoms, systemic disorders, living and working condition, and efficiency of conservative management. In first step, conservative treatments are recommended. Performing steroid and local anesthetic injection to the isthmic defects and caudal epidural area is a promising treatment. Further studies are needed for long term results.

Keywords: Caudal, Epidural, Injection, Spondylolysis.

Poster Bildiriler

Figure A, B, C, D



Isthmic defects on MRI, and CT (A,B,C). Performing the local and caudal epidural steroid/local anesthetic injections (D).

Poster Bildiriler

PP-017

COMPARISON OF MICRODISCECTOMY AND ENDOSCOPY ASSISTED DISCECTOMY METHODS USED IN POSTERIOR APPROACH IN SOFT SERVICAL DISK CASES

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PURPOSE: Surgical treatment of cervical disc herniation (CDH) usually involves discectomy and fusion with anterior approach. However, posterior approach is used as an alternative approach in sequestered lateral discs. In this study, patients with posterior approach between 2010 and 2018 were presented.

MATERIALS-**METHODS:** A total of 82 cases were operated with the diagnosis of sequelae CDH in our clinic. Of these, 35 patients underwent microdiscectomy with keyhole foraminotomy (KF) and 47 patients with endoscopy assisted discectomy (EAD).

RESULTS: KF of 41 cases; the mean age was 51 (32-70), and 20 were male. 15 of the cases had pain and 26 had strength. Location distribution; there were C3-4 in one case, C4-5 in one case, C5-6 in 20 and C6-7 in 19 cases. Preoperatively, the VAS was 8.5 (7-10). Of 41 patients who underwent EAD; the mean age was 38 (18-58) and 26 were male. In 20 of the cases, only pain was present, and 20 had additional strength loss. Location distribution; There were C3-4 in one case, C5-6 in 19 cases, C6-7 in 19 cases and C7-T1 in 2 cases. Preoperatively, the VAS was 8 (6-10). Although the operation was started with EAD in the initial phase, 5 cases were returned to KF and these cases were evaluated within the KF group. One patient from both groups developed hemiparesis after surgery, and they came to preoperative neurological state with physical therapy applications. Although the pain was completely past or decreased in the KF group, the pain severity did not change in 1 case in the EAD group and anterior discectomy was performed. CSF leakage was seen in 4 cases operated with EAD and in 3 cases operated with KF, no additional surgical intervention was required. No further complications were observed in our case series. No statistically significant difference was found at VAS in the surgical methods, Nurick scores were similar after surgery. (KF; pre op 0,63 – post op 0,05 ve EAD; pre op 0,51 post op 0,07).

CONCLUSION: Both KF and EAD in the soft and foraminal localized CDH cases are the most effective and safe surgical treatment methods.

Keywords: Posterior, cervical, discectomy, endoscopik, microscopic, key hole foraminotomy

Poster Bildiriler

PP-018

L5-S1 TRANSFORAMİNAL PERKÜTAN ENDOSKOPİK DİSKEKTOMİ İÇİN YENİ BİR PREOPERATİF UYGULANABİLİRLİK DEĞERLENDİRME YÖNTEMİ

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AMAÇ: Transforaminal perkütan endoskopik lomber diskektominin (PELD) interlaminer PELD'ye göre lokal anestezi altında yapılabilmesi ve sinir kökünün manipülasyonunu gerektirmemesi gibi nedenlerle avantajları mevcuttur. Ancak, transforaminal PELD'nin L5-S1 seviyesinde uygulanması iliak kanat, L5 transvers çıkıntı, hipertrofik L5-S1 faset eklemi, foramen çapının darlığı ve sakral ala gibi anatomik nedenlerle diğer seviyelere göre daha zordur. Bu nedenlerle bazen istenilen doğrultuda disk aralığına girilememekte ve köke bası yapan ana fragman çıkartılamamaktadır. Transforaminal PELD'nin L5-S1 seviyesinde başarıyla uygulanıp uygulanamayacağına preoperatif olarak karar vermeye yarayan bazı kriterler olmasına rağmen literatürde tanımlanmış kesin bir yöntem yoktur. Bu çalışmamızda transforaminal PELD'nin L5-S1 aralığında başarıyla uygulanıp uygulanamayacağına manyetik rezonans (MR) veya bilgisayarlı tomografinin (BT) kullanılmasıyla karar verilen yeni bir preoperatif değerlendirme yöntemi tanımlamaktayız.

YÖNTEM: L5-S1 disk hernisi tanısı alan bu yöntemi kullanarak preoperatif değerlendirme yaptığımız 14 hasta'yı çalışmaya dahil ettik. Çekilen preoperatif MR'da planan açıyla giriş noktasının orta hattan uzaklığı, pelvis AP grafi'de ise uygun eğim ile giriş noktasının iliak kanattan yüksekliği hesaplandı. Bu hesaplamalar eşliğinde giriş noktası hasta üzerine cilt işaretleyicisi ile işaretlendi. Sonrasında çekilen preoperatif ikinci MR veya BT üzerinde giriş noktası ile disk aralığı arasındaki çekilen hattın eğimine paralel olan yeni aksiyel ve koronal rekonstruksiyonlar oluşturuldu. Bu rekonstruksiyonlarda iliak kanatın veya yukarıda belirtilen diğer kemik yapılardan birinin endoskopik kanülün transforaminal olarak disk içine planlanan doğrultuda yerleştirilmesine engel olup olmayacağı tespit edildi. (Şekil 1)

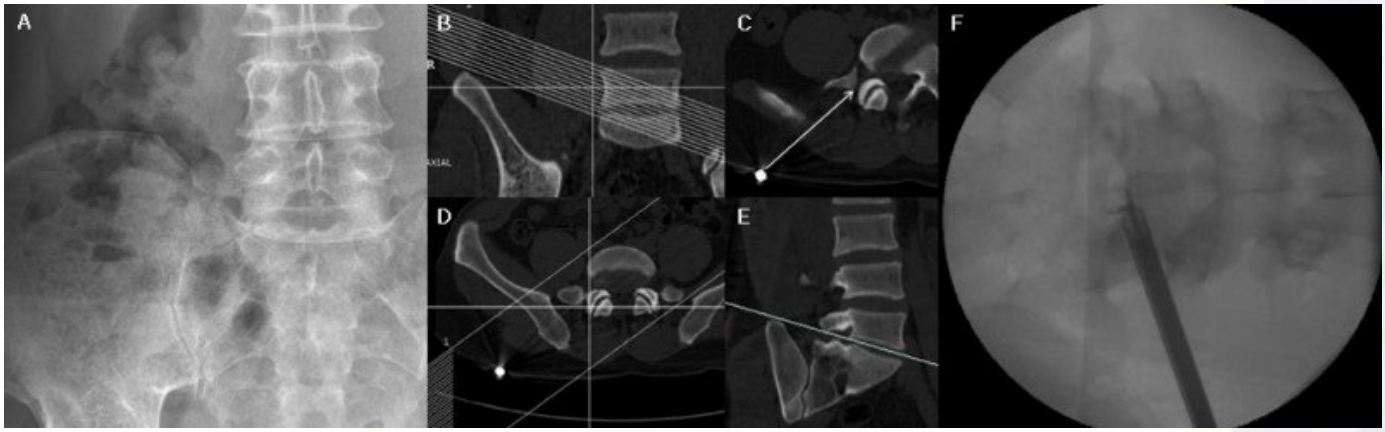
BULGULAR: Bu yöntemle değerlendirilen 14 hastadan 8'inin L5-S1 transforaminal PELD için uygun olduğuna, 6'sının ise uygun olmadığına karar verildi. Uygun olarak değerlendirilen 8 hastanın hepsinde L5-S1 transforaminal PELD başarıyla uygulandı.

SONUÇ: L5-S1 transforaminal PELD tarif ettiğimiz yöntemle uygun olarak kabul edilen tüm hastalarda başarıyla uygulanmıştır. Bu yöntemin genel kabul edilebilirliğinin prospektif olarak tasarlanan ve daha fazla hastanın dahil olduğu çalışmalarla değerlendirilmesi uygun olacaktır.

Anahtar Kelimeler: iliak kanat, L5-S1 disk, PELD, transforaminal, uygulanabilirlik

Poster Bildiriler

Şekil 1



Şekil 1'de preoperatif çekilen BT'de giriş noktası ile disk aralığı arasındaki çekilen hattın eğimine paralel olarak oluşturulan yeni aksiyel ve koronal rekonstruksiyonlarda (B, D) giriş noktası ile L5-S1 diski arasında engel olabilecek herhangi bir yapı bulunmadığı (C, E) ve sonuç olarak transforaminal PELD'nin başarıyla uygulandığı izlenmektedir. (F)

Poster Bildiriler

PP-019

OMURAGAYA İNVAZE KÜÇÜK HÜCRELI DIŞI AKCİĞER KANSERLERINDE, EŞZAMANLI LOBEKTOMİ VE SPİNAL EKSİZYON CERRAHİSİNİN MORBİDİTE VE MORTALİTEYE ETKİSİ

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Non-small cell lung cancers can invade the spine in their clinical course (3-8%), indicating a poor prognosis. For this reason, in many centers, in the presence of invasion of the spine, the patient is considered inoperable and in many clinics only medical treatment is applied. The aim of this study was to investigate the effects of radical excision of the spine and chest wall on morbidity and mortality in addition to en-block removal of the lung mass in non-small cell lung cancers with pleural, chest wall and spine invasion. In our study, retrospective data of 9 patients diagnosed with non-small cell lung cancer who were consulted by the thoracic surgery clinic between 2008-2018 were examined. 2 patients were female, 7 were male. The median age was 66,55. Preop Tokuhashi score was 7.6. In addition to lobectomy in 3 cases, total corpectomy was performed in the same session, costotransversectomy was performed in 6 patients, and spinal and thoracic wall reconstructions were performed after subtotal corpectomy and chest wall resection. All patients received postoperative chemo-radiotherapy. The average follow-up period was 15.9 months. In the follow-up of 5 cases the mean survival was 12.2 months. Causes of death was brain haemorrhage due to non-tumor causes in one case and tumor complications in the other 4 cases. The mean follow-up period was 20.5 months in the 4 cases that survived and there was no recurrence and metastasis. Non-small cell lung cancers are considered to be inoperable when they have metastasis or local invasion, and their life expectancy is very short. According to the results of our study, intralesional spine and chest wall excision may simultaneously alter mortality and expected survival in localized non-metastatic local spine invasions in half of the patients if the lung lesion is suitable for surgery. However, larger series and longer follow-up studies are required.

Anahtar Kelimeler: Omurga invazyonu, Küçük hücreli dışı akciğer kanseri, morbidite ve Mortalite

Poster Bildiriler

PP-020

SURGERY OF SPINE DEFORMITY IN PEDIATRIC PATIENTS WITH CONGENITAL KYPHOSCOLIOSIS CAUSED BY MYELOMENINGOCELE

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AIM: High-level myelomeningocele (MMC) patients with kyphosis may develop progressive scoliosis with the incidence and severity of scoliosis directly correlating to the level of motor dysfunction. The observed rate of progression ranges from 2.5° to 6.2° per year and often continues after cessation of growth, contributing to seating instability, respiratory difficulties, and pain. Our aim was to share our experience about congenital kyphoscoliosis caused by MMC from the surgical aspect and results of 1-year follow-up.

PATIENTS AND METHODS: We reviewed 30 spina bifida patients underwent spine deformity surgery from 2015 to 2018. Patients with lumbar kyphosis and sacral agenesis, congenital kyphoscoliosis and sacral agenesis, and paralytic scoliosis were excluded. Our criteria for the patient selection were; patients with congenital kyphpscoliosis with impaired truncal balance, progression of deformity angle, loss of sitting balance and cosmetic deformity. A chart review for demographic and clinical data was performed. Demographic and clinical data, surgical parameters, surgical techniques and levels, pre/postoperative deformity angles and complications were collated. All patients had urine cultures preoperatively and treated prophylactically with oral antibiotics. Preoperative and postoperative deformity angles were measured

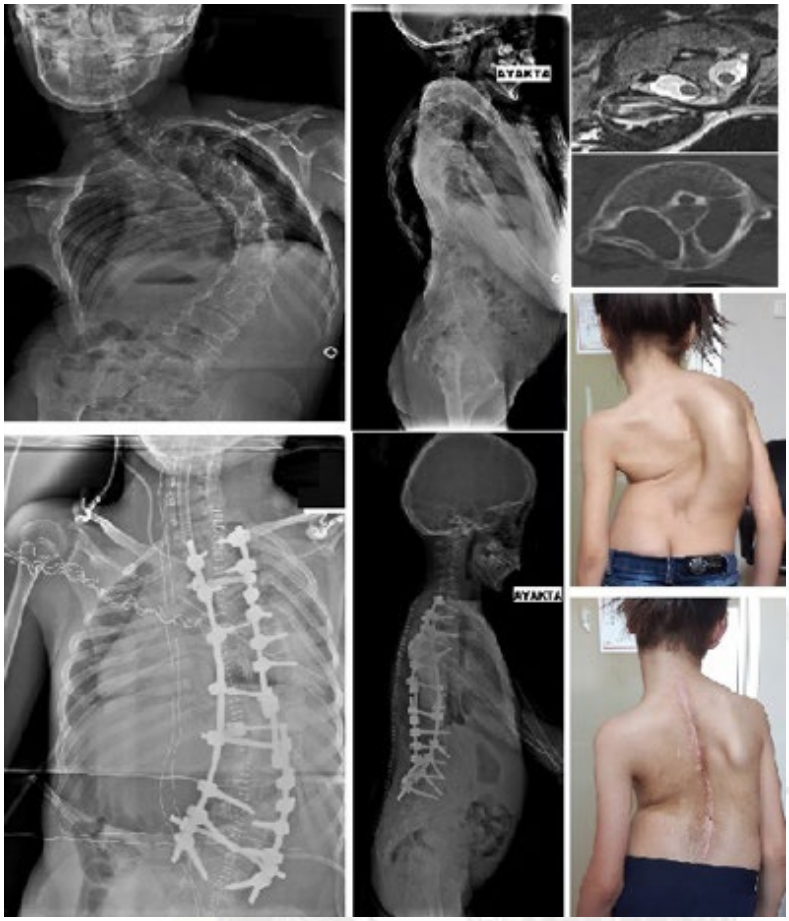
RESULTS: We had 6 patients with congenital kyphoscoliosis caused by MMC. The mean age at the time of surgery was 18.2(5-32.) There were 4 female and 2 male individuals. Apex of the scoliosis was at thoracic region (T8-T9) in 4 patients and at thoraco-lumbar (T8-L2) region in 2 patients. Preoperatively 4 patients were neurologically intact, one had a paraplegia and the other paraparesis. Sliding growing rod technique(SGRT) was performed in 1 patient and posterior fusion was carried out in remaining 5 patients. Posterior vertebral corpectomy was carried out in 4 patients. The mean preoperative scoliosis angle was 109.1° (range = 46 – 155°). Postoperatively, the mean scoliosis angle was 44.5° (range = 4 – 85°). All patients' sitting balance improved compared to their preoperative status. No complication was detected in any of the individuals.

CONCLUSION: In progressive kyphoscoliosis, tension and traction on the tethered dura may increase the risk of disturbances of cerebrospinal fluid (CSF) circulation and secondary neurologic complications, such as syringomyelia. There is increased risk for an iatrogenic CSF leak during surgical correction of kyphoscoliosis. The precise indications for surgical intervention are multifactorial, and the proposed benefits must be weighed against the potential risks. Newer spinal constructs now allow for fixation of the spine in areas previously difficult to instrument. Complications appear to be decreasing with improved understanding of the pathophysiology associated with myelomeningocele.

Keywords: spina bifida, kyphoscoliosis, myelomeningocele

Poster Bildiriler

Figure 1



preop & postop Views, MRI and Xrays

Poster Bildiriler

PP-021

MANAGEMENT OF CERVICAL SPONDYLOTIC MYELOPATHY WITH TOTAL CERVICAL DISC ARTHROPLASTY: AN ANALYSIS OF 18 PATIENTS WITH CLINICAL AND RADIOGRAPHIC DIAGNOSIS OF CERVICAL MYELOPATHY

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INTRODUCTION: Over the past decade,total cervical disc replacement (cTDR) has been established as a viable treatment option for cervical degenerative disc disease.Especially patients with radiculopathy due to certain disc pathologies have been treated successfully with excellent clinical long-term results.The aim of this study was to question the clinical and radiographic efficacy of ProDisc Vivo cervical disc arthroplasty (PDV-CDA) in patients with clinically and radiographically documented cervical spondylotic myelopathy (CSM),due to degenerative changes at the index level.

PATIENTS AND METHODS: 18 consecutive patients with documented clinical and radiological signs of CSM, as part of an ongoing prospective non-randomized single center study, are included in this investigation.MRIs were taken routinely to confirm the diagnosis of spinal stenosis with CSM.All of the patients underwent the same procedure through anterior cervical approach and a PDV-CDA was performed within strict inclusion criteria. Patients with instability, kyphotic deformity, residual motion of the index segment, distinct bony osteophytes,osteoporosis and those without radiographic (MRI) evidence of CSM were excluded. Conventional x-rays of the cervical spine were taken in AP and lateral as well as in flexion/extension to determine the global-segmental lordosis as well as the range of motion (ROM).

RESULTS: Patients had a mean age of 52.4 years and a follow up period of 37.3 months in average.PDV-CDA was performed in 15 patients for one, in 2 patients for two and one patient for three levels The mean ROM of the index level stayed consistent with 9.4° preoperatively and 9.6° ($p=0.637$) at last follow up, the global lordosis in neutral position changed from 5.8 ° to 14.2° significantly($p=0.002$).JOA score improved from 11.3 to 16.62(all patients Grade I)($p<0.001$) as well as NDI from 36.71 to 10.3($p<0.001$) and VAS score from 5.71/6.07 (arm/neck) to 1.3/2.0($p<0.001$/ $p<0.001$).The mean Nurick grade was 1.33 pre-operatively and dropped down in all cases to 0($p<0.001$).

CONCLUSION: This study proved that PDV-CDA was a viable treatment option with excellent outcomes even in management of CSM with regard to pain scores(VAS) and neck disability index by improving the neurologic deficit, arm pain and local neck symptoms together with scores of functional outcome(JOA and NDI scores). Considering the Nurick grades our clinical results revealed that, anterior decompression and implantation of cTDR could improve the severity of myelopathy within strict inclusion criteria as well.This study also concluded that cTDR was improving the pre-operative ROM and lordosis with great statistical significance which was a highly remarkable result lacking in the literature.

Keywords: Cervical spondylotic myelopathy, cervical disc arthroplasty, spinal stenosis, cervical global lordosis, cervical range of motion, Nurick grade

Poster Bildiriler

PP-022

SPINAL LYMPHOMAS

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Unıversıty of Health Scıences Istanbul Umranıye Traınıng And Research Hospıtal

Spinal lymphomas (SLs) are among hematological disorders affecting the spine. They accounts for 10 to 20% of all epidural malignancies. They are commonly located in the vertebra, in the epidural space and in the paravertebral area. Although a biopsy procedure seems to be enough in most cases, SL in some cases may cause instability and /or spinal cord compression, requiring surgery. The aim of this study is to review results of surgery for SL.

There were 10 male and 5 female cases, aged between 15 and 73 years old (mean 44.42). SL was located in the lumbar spine in 10 cases, in the thoracic spine in 4, and in the sacrum in one case. SL was located in the vertebral body in 9 cases, in vertebral+epidural location in 3 cases, in paravertebral area in 2, and epidural in one case. In the first stage, a biopsy was taken in 12 cases. As a result of progressive neurological deficite, one case underwent posterior decompression and stabilization, and two cases underwent decompression alone. Five cases with verified biopsy, subsequently underwent decompression and stabilization because of spinal instability and neurological deficit. All cases were refered two hematology for radiotherapy and chemotherapy.

Lymphomas may involve vertebra, epidural or paravertebral area, causing spinal instability or spinal cord compression. Tissue diagnosis is the choice of procedure in asymptomatic cases. However, cases with instability and neurological deficite may require an augmentation or stabilization procedure with or without decompression.

Keywords: Spinal Lymphomas, vertebra, metastasis,

Poster Bildiriler

PP-023

MAGNETICALLY CONTROLLED GROWING RODS IN 41 PATIENTS - SINGLE CENTER EXPERIENCE

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OBJECTIVE: The aim of the study is to evaluate our dual magnetic controlled growing rod (MCGR) practices in early-onset scoliosis in terms of curve correction and control, to the effect of sagittal and coronal balance.

MATERIAL: Search was conducted for MCGR patients in hospital online database. Forty-one of 46 patients were included in the study, 5 patients were excluded since minimum follow-up time was less than 1 year. Mean age was 8.1 (4 - 10) years, mean follow-up was 32 months (10 - 53). Distraction was done at 3-months intervals. Cobb angle, T1-T12 kyphosis angle, T1-S1 lengths, coronal and sagittal balance were evaluated.

RESULTS: The mean preoperative, postoperative and last-follow-up Cobb angle were 57.2 (31 - 94), 30.6 (10 - 61), and 28.3 (10 - 59), respectively ($p<0.01$). The mean pre-operative, post-operative and last follow-up T1-S1 lengths were 281.3 (range, 170-365), 317.4 mm (range, 207-385) and 348.2 mm (range, 227-405), respectively ($p<0.05$). The mean pre-operative, post-operative and last follow-up kyphosis angle was 39.3° (range, 17-74), 19.5° (range, 10-39) and 26.1° (range, 12-52), respectively ($p<0.05$). Complications were as following: wound breakage in 1 patient, superficial infection in 2 patients, rod breakage and screw loosening in 2 patients, and pull-out in 7 patients. MCGR was converted to SHILLA system in 1 patient due to recurrent upper construct pull-out.

CONCLUSION: Even though MCGR was thought to prevent unexpected surgeries in early-onset scoliosis, a substantial number of complications requiring additional surgeries arise during early-onset scoliosis treatment.

Keywords: Early-onset scoliosis, growing rod, non-fusion spine surgery, magnetic growing rod, spinal growth.

Poster Bildiriler

PP-024

ENDOSCOPE-ASSISTED DECOMPRESSION OF CERVICAL SPINAL STENOSIS VIA UNILATERAL APPROACH: PRELIMINARY REPORT OF FOUR CASES

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BACKGROUND: The spinal cord undergoes compression resulting in deprived nutrition in cases with narrow cervical canal. Decompression with unilateral hemilaminectomy has been successfully applied to the lumbar narrow spinal canal cases and some series using minimally invasive methods have been published during the recent years. Similarly, limited series are also available for the cervical region. In this report, the endoscopy-assisted unilateral decompression technique is presented in four cases with clinical findings of cervical narrowing.

METHODS: The patients were betwwen 31 and 47 years old, one of them women. Their JOA score was 15 and 16. MR scans showed that degenerative changes involving the cervical vertebrae and mild or moderate stenosis was observed at C3-4, C4-5, C5-6 and C6-7 levels, which prevented the passage of CSF. Theit analyzing of somatosensorial evoked potential were disturbed at all cases.

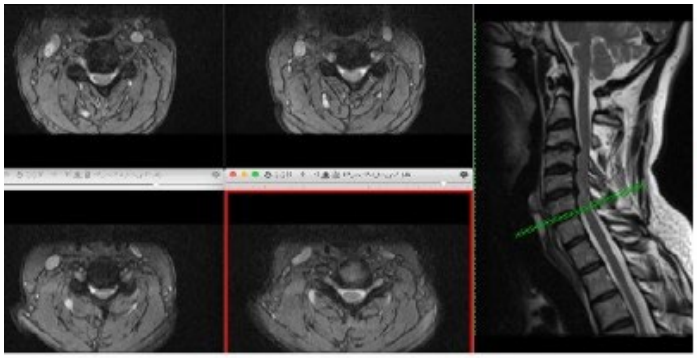
TECHNIQUE: Due to canal narrowing at multiple levels, surgical intervention was done on two separate sites. First, the level was determined with the help of fluoroscopy, and a working cannula was placed with the help of the tubular dislocators approximately 2 cm lateral to the midline, and hemilaminectomy and lig. flavectomy were performed with the endoscopy-assisted system (Easy-Go®). Hemilaminectomy could be conducted at two levels from one hole; then the distance was again determined, descending to the lower level, and the same surgical procedure was repeated. In all cases, four hemilaminectomies and lig. flavectomy were performed from two separate holes. There were no complications during and after the operation. The JOA scores were improved to 17 and 16 at the follow-up.

CONCLUSION: The neck extensor muscles can be protected as far as possible without detaching from the insertion points with the endoscopy-assisted system. In addition to providing adequate decompression enabling CSF flow around the cervical spinal cord, this technique offers advantages such as short procedure time and less blood loss. The technique can be performed for selected patients with mild clinical table, yet we need to further prospective and comparative case series.

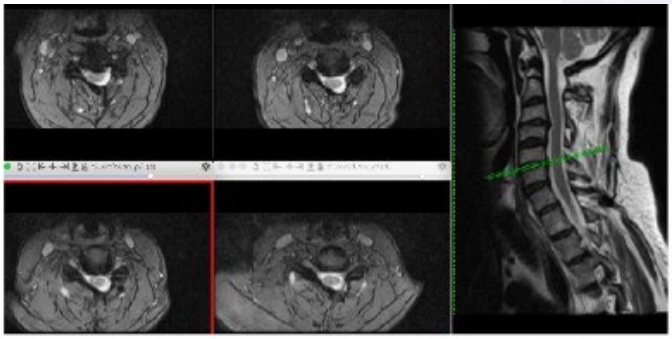
Keywords: Endoscope, decompression, cervical spinal stenosis.

Poster Bildiriler

Perop and postop images



Preoperative images



Postoperative images

İntraoperative images

Poster Bildiriler

PP-025

EVALUATION OF CHOROIDAL VASCULAR CHANGES IN PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS USING ENHANCED DEPTH IMAGING OPTICAL COHERENCE TOMOGRAPHY

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PURPOSE: We aimed to evaluate the choroidal thickness (CT) in patients with adolescent idiopathic scoliosis using enhanced depth imaging optical coherence tomography (EDI-OCT).

METHODS: In this cross-sectional, observational comparative study, 56 eyes of 56 patients with adolescent idiopathic scoliosis (AIS) and 56 eyes of 56 age and gender matched healthy subjects were included. All participants underwent complete ophthalmologic examination and CT measurements at the fovea and at 750-µm intervals from the fovea to 1.5 mm in the nasal and temporal site obtained by spectral-domain EDI-OCT.

RESULTS: Of the 56 patients with AIS, 42 (75%) were female and the mean age was 15.3 ±2.6 years; of the 56 healthy controls, 40 (71.4%) were female and the mean age was 14.9±2.6 years ($p = 0.83$, and $p = 0.48$ for gender and age, respectively). The mean subfoveal CT was lower in AIS patients (285.2 ± 24.4 µm) than that of controls (313.2 ± 28.8 µm), ($p < 0.001$). The difference was also significant at all extrafoveal measurement points ($p < 0.001$ for all). There was a negative correlation between subfoveal and extrafoveal measurement locations CTs and the Cobb angle in AIS patients ($r = -0.708$, and $p < 0.001$ for subfoveal; $r = -0.661$, and $p < 0.001$; $r = -0.642$, and $p < 0.001$; $r = -0.709$, and $p < 0.001$; $r = -0.691$, and $p < 0.001$, for the measurement locations at 0.75 mm nasal, 1.5 mm nasal, 0.75 mm temporal, and 1.5 mm temporal to the fovea, respectively).

CONCLUSION: This preliminary study showed that AIS patients have thinner CT compared to that of healthy subjects. The lower CT was correlated with the increased angle of scoliosis. Further studies are warranted to clarify the relationship between AIS and choroidal thinning.

Keywords: Adolescent idiopathic scoliosis, choroidal thickness, enhanced depth imaging optical coherence tomography

Table 1. The comparison of the demographics and the clinical parameters (mean ± standard deviation) between adolescent idiopathic scoliosis (AIS) and control groups.

	AIS	Control	p value
Age, median (IQR), (years)	16 (14-17)	16 (13-17)	0.48
Gender, (M/F)	14/42	16/40	0.83
SE, median (IQR), (D)	-0.38 (-0.63- -0.13)	-0.38 (-0.50- 0.0)	0.23
Kmean, (D)	43.50 ± 1.60	43.20 ± 1.30	0.21
CCT apex, (µm)	536.0 ± 37.6	530.5 ± 30.6	0.40
CCT thinnest, (µm)	529.8 ± 39.1	524.3 ± 31.6	0.41
AL, median (IQR), (mm)	23.30 (23.11-23.66)	23.37 (23.20- 23.70)	0.97
Angle of scoliosis	30.8 ± 13.7	N/A	N/A

M/F: Male/female; SE: Spherical equivalent; K: Keratometry; CCT: Central corneal thickness; AL: Axial length; D: Diopter; N/A: Not applicable

Poster Bildiriler

PP-026

COMPARISON BETWEEN THE SUCCESS OF FUSION VIA LAMINECTOMY VERSUS TLIF CAGE PROCEDURES ON LUMBAR SPINAL STENOSIS

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OBJECTIVE: The aim of this study was to compare laminectomy with TLIF cage as a surgical option in Lumbar spinal stenosis for succesful interbody fusion on multiple segments at patients older than 35 years. And to examine these surgical procedures' radiological and clinical short term results

MATERIALS-METHODS: Patients who were older than 35 at the time and who have been operated between 2010 and 2019 at Uludag University Faculty of Medicine Hospital Orthopedics and Traumatology Clinic due to their diagnosis with Lumbar spinal stenosis have been the subjects of this study. Patients were categorized into and compared against in 6 groups in total operated with (a) TLIF Cage procedure on single segment (52 patients), on 2 segments (21 patients), and on 3 segments (12 patients); and (b) laminectomy on single segment (35 patients), on 2 segments (38 patients), and on 3 segments (10 patients) for interspinal fusion. After the operation, the follow-up results were evaluated with clinical and radiographic criteria and compared based on postoperative outcomes (ODI (Oswestry Low Back Pain Disability) scores,VAS (Visual Analog Scale), SF -36 (Short Form Health Survey) and Brantingan-Steffee criteria with using X-ray and CT for radiographic evaluation) at the end of follow up.

RESULTS: Totaly,166 patients evaluated. Single segment TLIF cage procedure was done on 52 patients and single segment laminectomy was done on 35 patients. Success scores as clinical and radiologhical for fusion on single segment ODI – 10,5/18,8, VAS – 3,5/4,57, Brantingan-Steffee criteria (grade 4-5) - 48 patients / 29 patients. 2 segments TLIF cage procedure was done on 21 patients and 2 segments laminectomy was done on 38 patients. Success scores as clinical and radiologhical for fusion on 2 segments ODI – 15,8/24,5,VAS - VAS -4,09/6,1, Brantingan-Steffee criteria (grade 4-5) - 18 patients / 31 patients. 3 segments TLIF cage procedure was done on 12 patients and 3 segments laminectomy was done on 10 patients. Success scores as clinical and radiologhical for fusion on 3 segment ODI – 14,5/22,05, VAS - VAS – 2,9/ 5,5, Brantingan-Steffee criteria (grade 4-5) - 8 patients / 8 patients.

CONCLUSION: Both procedures on different segments (Laminectomy and TLIF cage) were done on patients with lumbar spinal stenosis had a similar results on radiographic criters for fusion. But the clinical scores are better at TLIF cage procedure.

Keywords: Fusion, Laminectomy, Lumbar Spinal Stenosis, Posterior Lumbar Interbody Fusion, TLIF Cage

Poster Bildiriler

PP-027

MYOSITIS OSSIFICANS IN THE PARASPINAL MUSCLES AFTER CARDIAC SURGERY

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INTRODUCTION: Myositis ossificans (MO) is a benign condition of heterotopic bone formation that remains difficult to distinguish from soft-tissue and bone malignancies. Normally this condition is atypical bone formation after trauma. In this study, we define an unusual case of nontraumatic MO in thoracolumbar paraspinal muscle in pediatric patient.

CASE: A 6-year-old male patient was admitted to our hospital with back pain and swelling. His past medical history revealed he had undergone open heart surgery. These complaints began 2 years after the surgery. Physical examination revealed a swelling of 5 * 3 cm in the left thoracolumbar junction. There was no redness or increased heat in this area. On palpation examination, pain was observed in the same area of the patient. The patient was unable to form the back hump when bending over, and when he was going to get something from the floor, he bent down like a rolling pin without flexing his back. Laboratory findings (ESR, CRP, etc.) were normal. Direct radiography showed bone formation in the lateral thoracolumbar region, almost in the entire back. There was even a fracture near to the midline of bone formation. MRI showed atypical bone formation in the same area and was evaluated in favor of Myositis ossificans.

CONCLUSIONS: Myositis Ossificans is a local, benign, atypical bone formation that frequently occurs in muscle and cartilage tissue. Although it is more common in middle age, it is more rare in pediatric patients. Patients complain of swelling and local pain. This can cause contraction and movement limitation. In this study, we aimed to contribute to the literature by presenting an atypical case of myositis ossificans in a pediatric patient.

Keywords: Myositis ossificans, Paraspinal Muscles, Cardiac Surgery

Direct lateral radiography

Poster Bildiriler

PP-028

MORPHOMETRIC ANALYSIS OF C2 VERTEBRA WITH TOMOGRAPHY GUIDANCE

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INTRODUCTION: Instrument techniques to the second cervical vertebra are widely used since the methods described by Goel, Harms and Magerl. While applying these techniques in the upper cervical region, it should be kept in mind that our anatomy knowledge should be good regarding different anatomic variations of each patient. In this study, we aimed to evaluate the morphometric measurements of the second cervical vertebra in Turkish society.

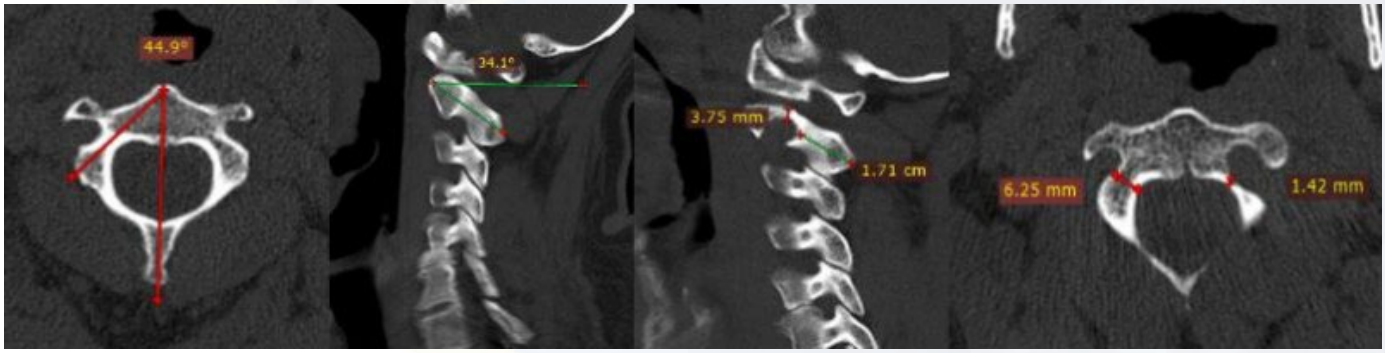
METHODS: The patients who admitted to Adana City Training Research Hospital Neurosurgery Outpatient Clinic and who had cervical spine tomography were evaluated retrospectively. Measurements were performed in 75 patients with no pathological findings in the C2 vertebra. C2 pedicle width, isthmus length and height, and pedicle angles in horizontal and vertical plane were evaluated.

RESULTS: 36 female and 39 male patients were enrolled in the study. High riding vertebral artery(HRVA) was detected in 14 (18.6%) patients. C2 pars length, pedicle width and istmus height were measured as 20.3 mm, 5.6 mm and 6.1 mm respectively. Similarly the mean values were 12.4 mm, 2.9 mm, 2.7 mm in patients with HRVA. The mean angle of the pedicle was 33.6 ° towards cranial in the sagittal plane and 43.2 ° medial in the axial plane. Fig1: Measurements of CT sections

DISCUSSION and **CONCLUSION:** Anatomical variations such as HRVA may lead serious complications during surgery and should be kept in mind. In the literature, HRVA has been reported with a rate of 32%. It was found to be 18.6% in our series. Preoperatively, each individual should be evaluated in custom fit and instrumentation should be applied regarding unique anatomical features. Further measurements in larger series will be more valuable in detecting anatomical variations in the normal population.

Keywords: C2 Vertebra, CT Guided Assessment, Morphometric Analysis

Measurements of CT sections



Poster Bildiriler

PP-029

SELF-ESTEEM AND QUALITY OF LIFE IN GIRLS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

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INTRODUCTION: Self-esteem; it is a concept related to the self-esteem of the individual and to make accurate evaluations about himself/herself. The adolescent lives under the influence of the ideal body model that the culture he / she lives in and experiences the process of forming the body image. The ideal body appearance for adolescent is especially determined by group of friends, family, and society. Negative body image perception of scoliosis or scoliosis-induced treatments has been shown to have a negative effect on the quality of life (QoL) in many studies. However, the effects of this situation on self-respect of adolescents were questioned in few studies.

OBJECTIVES: The aim of this study was to investigate self-esteem and QoL in adolescent with scoliosis and to investigate the effect of deformity severity and the use of brace wearing on body image.

MATERIALS-**METHODS:** Thirty-four girls with adolescent idiopathic scoliosis (AIS) and 45 girls without deformities in the control group were included. To evaluate self-esteem, the Rosenberg Self-Esteem Scale (RSES) was used in both groups, and QoL of the AIS group was evaluated with the SRS-22 questionnaire. The results statistically were analyzed.

RESULTS: The mean age was 13.6 years in AIS group and 14.4 years in control group. The mean Cobb angle was 32.9° and 24 of them were using rigid brace in AIS group. The demographic characteristics of both groups and the clinical features of the AIS group are given in Table 1. The use of brace did not reveal differences for RSES. A statistically significant correlation was found between SRS-22 body image and total score of the AIS group with RSES (p= 0.002 and p=0.001). (Figure 1)

CONCLUSION: Body image is affected a multidirectional way in adolescence period. In this age group who develops feelings and attitudes about their bodies according to the ideal measurements presented to them, the deviation from the ideal dimensions, even without any diseases, causes discontent among the body image of the individual and affects their self-esteem. Scoliosis is a condition that negatively affects adolescence due to deformity affecting body image as well as using brace. To develop healthy body image, to protect self-esteem and personality development in this period girls with AIS; approach should follow as not to give body-oriented images by health professionals. to protect individuals from unhealthy media and internet messages, and to support adolescents and families.

Keywords: adolescent, self-esteem, scoliosis, quality of life

Poster Bildiriler

Figure 1: Correlations between Rosenberg Self-Esteem Score and SRS-22 Body Image Score

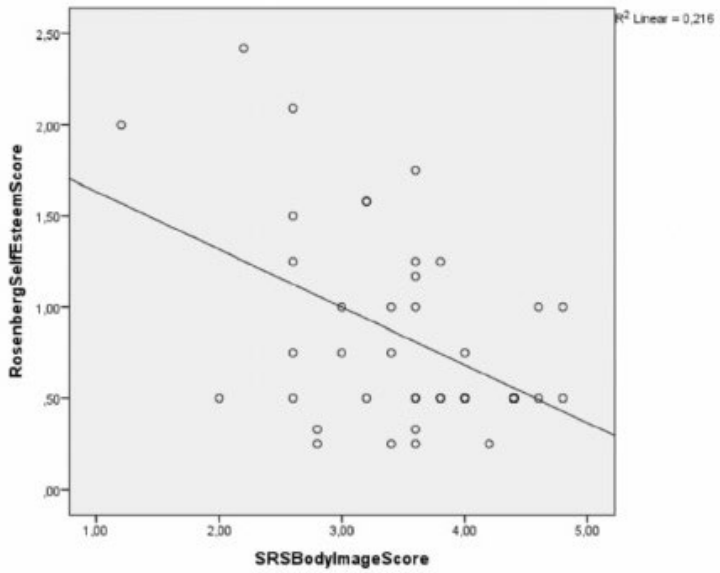

Table 1: Demographic and Clinical Features of Groups

Variables	Scoliosis Group Mean±SD (Min-Max)	Control Group Mean±SD (Min-Max)	P value (p≤0,05)
Age	13,69±1,56 (11,00-17,00)	14,44±0,88 (12,00-16,00)	0,010
BMI	19,81±3,05 (15,43-28,21)	21,35±2,58 (15,79-29,74)	0,002
Rosenberg`s Self-Esteem Scale	0,83±0,54 (0,25-2,42)	1,10±0,75 (0,25-2,83)	0,133
SRS-body image	3,51±0,79 (1,20-4,80)	NA	NA
SRS-mental health	3,87±0,66 (2,20-5,00)	NA	NA
SRS-total score	3,93±0,55 (2,40-4,80)	NA	NA

Poster Bildiriler

PP-030

DOES THE PRE-OPERATIVE L5-TILT PREDICT POST-OPERATIVE CORONAL IMBALANCE IN PATIENTS WITH LENKE TYPE V ADOLESCENT IDIOPATHIC SCOLIOSIS? A RETROSPECTIVE REVIEW OF 84 CASES

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INTRODUCTION: Many factors have been proposed to result in early coronal imbalance and lumbosacral obliquity in patients with Lenke Type V adolescent idiopathic scoliosis(AIS) following selective fusion surgery.The aim of this study was to evaluate, whether pre-operative L5 tilt had any effect on immediate post-operative coronal imbalance in patients with Lenke type V AIS who underwent selective fusion,whether immediate coronal imbalance could be predicted by measuring the L5 tilt and whether immediate coronal imbalance was permanent or temporary.

METHOD: 84 patients with Lenke Type V AIS who underwent selective fusion between 2010-2015 were included. Demographical data were collected from patients' files,while radiographic measurements were undertaken from standing anteroposterior and lateral X-rays.Coronal balance was defined as a difference less than 20mm between C7 plumb line (C7PL) and central sacral vertical line (CSVL). As a result of the evaluation of coronal balance (CB) on post-operative standing X-ray, patients were divided into two groups: immediate post-operative CB versus immediate post-operative coronal imbalance (CIB). Pre- and post-operative L5 tilts,amounts post-op immediate and at the last follow-up coronal balance and degrees of total correction angles were compared.

RESULTS: 84 patients had a mean age of 16.65 and a mean follow-up period of 61.54 months.48 patients were grouped in immediate CB (mean C7PL-CSVL:10.34mm), while 36 patients were grouped in immediate CIB (mean C7PL-CSVL:30.52mm). 70% (26/36) of patients in immediate post-operative CIB group was detected to regain CB at the last follow up (mean C7PL-CSVL:12.88mm). Mean pre-op L5 tilt in patients with immediate CB was 11.37°,while it was 21.01° in patients with immediate CIB ($p<0.001$). Pre-operative high L5 tilt was detected to be a risk factor for the development of post-operative immediate CIB with high statistical significance, while the cut-off value of pre-op L5 tilt was calculated as 20.5°. Mean post-op L5 tilt in patients with immediate CB and CIB were 5.1° and 6.67° respectively ($p=0.27$). Mean amount of total correction of CB groups was 38.72°, while it was 40.10° in CIB group ($p=0.27$).

CONCLUSION: High pre-operative L5 tilt (cut-off value: 20.5°) was found to be a risk factor with high statistical significance for the development of coronal imbalance in patients with Lenke Type V AIS following selective fusion. Pre-operative L5 tilt above 20.5° might be used as a predictive factor for the development of immediate post-operative coronal imbalance. This study showed that pre-operative L5 tilt was one of the most important factors to predict immediate coronal imbalance.

Keywords: Adolescent idiopathic scoliosis, coronal balance, L5 tilt, selective fusion, central sacral vertical line, C7 plumb line

Poster Bildiriler

PP-031

POSTOPERATIVE CLINICAL AND RADIOLOGICAL OUTCOMES OF MICRODECOMPRESSION FOR DEGENERATIVE LUMBAR SPINAL STENOSIS USING COMBINE INTRA- AND TRANSSPINOUS SPLIT LAMINECTOMY APPROACH (CITSSL): EXPERIENCE OF 26 CASES

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OBJECTIVE: Intraspinal and Transspinous Split Laminectomy (TSSL) are described as minimal invasive approaches for degenerative lumbar spinal stenosis (DLSS). When compared to classic laminectomy, these approaches are less invasive. In last two years the author used combination of both approaches to treat DLSS. In this study, postoperative clinical and radiological outcomes of 26 DLSS cases using CITSSL approach have been presented.

METHODS: 26 (19 women and 7 men) patients operated from 2017 to 2019, at Department of Neurosurgery-Bezmialem University, for symptomatic DLSS. Early clinical outcomes were evaluated retrospectively using VAS, walking capacity, ODI, level of satisfaction, length of hospital stay and surgical complications. Early radiological outcomes were evaluated using early postoperative CT, dynamic x-rays. For cases followed more than 6 months MRI on 6th, and 18th postoperative month.

RESULTS: The mean follow-up period was 14.1 (1-20) months. The mean age of patients was 64.3 (47-85) years. The most common complaints were lower limb pain (84.6%), low back pain (73.1%), and neurogenic claudication (57.7%), respectively. ODI showed a mean improvement in symptoms from 63.2% (52-82) to 16.8% (6-36), and VAS showed that the intensity of leg and back pain decreased from 8.6 (7-9) and 6.3 (5-8) to 2.24 (1-4) and 2.82 (1-5) points, respectively. In 26 operations 89 levels were decompressed with average of 3.4 (1-5) levels/patient (median: 3 levels). Walking capacity increased from 3.8 (severely restricted) to 1.38 (sightly restricted), 92.3% of patients indicated that they were moderately satisfied or very satisfied. Dynamic x-rays revealed no postoperative instability after surgery. Postoperative CT and MRIs showed significant widening of foraminal, lateral recesses and spinal canal at treated levels. Two cases of those complained of motor deficits (10/26) had the same deficits while the rest had improved completely. From four patients who had degenerative scoliosis just one preferred to get posterior instrumentation with TLIF fusion and brace was recommended for another one. Up to last analysis date, no one reoperated for lumbar stenosis again. Dural tear was seen in 1 patient. The mean of bleeding loss was 34.4 cc/level. The mean of operation period was 51.2 minutes/level.

DISCUSSION and CONCLUSION: The clinical and radiological outcomes of follow-up period of 14 months. This new approach showed less operation period and bleeding loss as well as showed a favorable maintenance of improvement in symptoms. Radiologically had been showed that this approach does not alter the stability of the spine.

Keywords: Degenerative lumbar spinal stenosis, minimal invasive decompression approach, intrasspinous approach, transspinous split laminectomy technique

Poster Bildiriler

PP-032

MANAGEMENT OF SPINAL INSTABILITY WITH FUSIONLESS STAND-ALONE PERCUTANEOUS PEDICLE SCREW FIXATION. RETROSPECTIVE CASE SERIES OF 25 PATIENTS WITH 76.4-MONTH FOLLOW-UP

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INTRODUCTION: This study reports on the long term radiologic and clinical results of stand-alone percutaneous pedicle screw fixations (PPSF) without fusion applications in patients with spinal instability. PPSF without fusion application in the presence of spinal instability can be expected, in theory, to result in a negative outcome, although there are few studies discussing the long-term results of the approach in detail.

METHOD: Included in the study were 25 patients with the major lumbago complaints, having been diagnosed with spinal instability and treated with stand-alone fusionless PPSF. Patients with neurological symptoms that would require open decompression were excluded from the study. The patients were recalled for radiological controls in the postoperative first and sixth months, and then annually thereafter. The clinical results were evaluated using a visual analogue scale (VAS), the Oswestry-Disability-Index (ODI) and the Rolando-Morris Disability Questionnaire (RM).

RESULTS: The 25 patients, with a mean age of 57.5± 15.4 (31-81), were followed up for an average of 76.4 months. VAS values were found to be 7.92, 3.92 and 2.79 in the preoperative, median and final control, respectively. In the same period, ODI scores were found to be 64.75, 31.25 and 17.33, and RM scores were found to be 22.25, 9.00 and 4.29, respectively. A significant difference was identified between the preoperative and subsequent values. No significant difference was identified between the median and final values ($p<0.05$). Two of the patients died of unrelated causes, and one of the patients was re-operated due to implant failure (screw breakage).

Conclusion: Contrary to expectations, the outcomes of PPSF application without fusion in the patients with spinal instability were found to be satisfactory; implant failure did not lead to the expected major problems. In the majority of patients, this surgical procedure brought positive long-term results by accelerating auto-fusion like process.

Keywords: Spinal instability, percutaneus fixation, spontaneous fusion

Poster Bildiriler

PP-033

THE RELIABILITY OF THE ANKLE CLONUS IN DEFINING THE DEVELOPMENT OF NEUROLOGICAL DEFICITS DURING SPINAL DEFORMITY SURGERY

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PURPOSE: The ankle clonus which is generally accepted as a pathological examination finding can be temporarily occur in patients awakening from anesthesia. Hoppenfeld et al. declared that the temporary ankle clonus was an important finding showing the medulla spinalis integration during spine surgery. In this study we aimed that is the temporarily ankle clonus a reliable method for determining the neurologic deficits during spine surgery in pediatric deformity patients.

Material **METHODS:** The study was carried out with the prospective evaluation of 35 (10 male/25 female) patients who were operated with the diagnosis of adolescent idiopathic scoliosis (AIS) or Scheuermann kyphosis (Sch) in two different centers. The patients were divided into three groups according to the anesthesia protocol. In Group I and Group II four anesthetic agents were used and in Group III, Total Intravenous Anesthesia(TIVA) was administered. As surgical method, all patients were treated with pedicle screwed constructs with standard posterior approach. The presence of the spontaneous clone and then the presence of forced clones were recorded.

RESULTS: There were 12 patients in group I (10 AIS and 2 Sch), 13 in group II (12 AIS and 1 Sch), 10 in group III (9 AIS and 1 Sch). The mean age of patients was 15 years old. The mean weight was 54 kg and the mean height was 163 cm. The average operation time was 314 minutes. The average blood loss was 1120 ml. Patients received an average of 1.9 units of blood supplementation. Clonus was not observed in 14(40%) patients in all groups. Clonus was not observed in 2 patients in group I, Clonus was not observed in 7 patients in group II, Clonus was not observed in 5 patients in group III (table 1). There was no statistically significant relationship between the presence of clonus and blood loss, duration of operation time, amount of blood transfusion, age, sex (p=0.906, p=0.722, p=515, p=0.946, p=0.644, respectively). There was no statistically significant difference between groups (p=0.124). There were no neurological deficits in any patient during postoperative period.

CONCLUSION: As conclusion ankle clonus test is not a reliable method to monitoring the neurological deficit during spine surgery and anesthetic protocols is not interact with presence or obsebce of the test.

Keywords: Ankle klonus, pediatric deformity, anesthetic protocols

Poster Bildiriler

PP-034

MINIMUM CLINICALLY IMPORTANT DIFFERENCE OF HEALTH RELATED QUALITY OF LIFE SCALES IN ADULT SPINAL DEFORMITY VARY WITH AGE, GENDER, BASELINE DISABILITY SCORES AND THE DIRECTION OF CHANGE PERCEIVED BY THE PATIENT

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AIM: Minimum clinically important difference (MCID), an important concept to evaluate effectiveness of treatments, may not necessarily be a single magical constant for any given health related quality of life (HRQoL) scale. It shows variations based on the calculation method as well as pathology, baseline scores, comorbidities and treatment modalities. We aimed to analyze effects of age, gender and baseline scores as well as the direction of change perceived by the patient (positive vs negative) on MCID values of HRQoL scales in adult spinal deformity (ASD) population.

METHODS: Patient population consisted of surgical and nonsurgical patients from a multicenter ASD database who completed pretreatment and 1-year follow-up COMI, ODI, SF-36 PCS, SF-36 MCS, SRS-22R as well as an anchor question of back health related change over the past year. MCIDs for each HRQoL measure were calculated by an anchor-based method by using latent class analysis (LCA) for the overall population as well as subpopulations based on age, gender, baseline scores (for ODI and COMI) separately for patients with positive vs negative perception of change.

RESULTS: A summary of results may be seen in Fig 1. Patients with baseline ODI score <20, 20-40 and >40 had MCID value of 2.24, 11.35 and 26.57 respectively. Similarly, patients with baseline COMI score <2.75, 2.8-5. 4 and >5.4 had MCID threshold of 0.59, 1.38 and 3.67. Overall MCID thresholds for deterioration and improvement were 0.27 and 2.62 for COMI, 2.23 and 14.31 for ODI, and 0.01 and 0.71 for SRS-22. MCID values were not affected by age or gender.

CONCLUSION: The findings of this study demonstrate that MCID values change by baseline scores, direction of change (improvement/deterioration) but not by age and gender. MCID, at its current state, should be considered as a concept. AI applications in larger cohorts may be useful in defining MCID as a function rather than a fixed value.

Keywords: adult spinal deformity, minimum clinically important difference, health related quality of life, outcome measures

Poster Bildiriler

Figure 1

Figure 1.MCID scores regarding age, gender, direction and baseline scores

Health Related Quality of Life Parameter	Value	MCID	
		Improvement	Deterioration
COMI	Overall	2.62	0.27
	Female	2.67	0.22
	Male	2.42	0.37
	≤36 years old	2.64	0.25
	>36 years old	2.68	0.64
	<2.8	0.59	-
	2.8-5.4	1.38	-
	>5.4	3.67	-
ODI	Overall	14.31	2.23
	Female	15.26	4.24
	Male	14.85	2.10
	≤36 years old	15.29	3.90
	>36 years old	17.00	3.09
	<20	2.24	-
	20-40	11.35	-
	>40	26.57	-
SF-36 PCS	Overall	7.33	0.13
	Female	5.99	0.83
	Male	8.66	0.96
	≤36 years old	6.51	1.08
	>36 years old	8.80	3.08
SF-36 MCS	Overall	4.37	0.24
	Female	4.13	1.49
	Male	3.08	0.91
	≤36 years old	3.50	2.53
	>36 years old	7.99	6.54
SRS-22	Overall	0.71	0.01
	Female	0.72	0.03
	Male	0.67	0.14
	≤36 years old	0.74	0.004
	>36 years old	0.75	0.24

MCID scores regarding age, gender,directionand baseline scores

Poster Bildiriler

PP-035

MINI-OPEN TLIF PROCEDURE WITH UNILATERAL PEDICLE SCREW FIXATION

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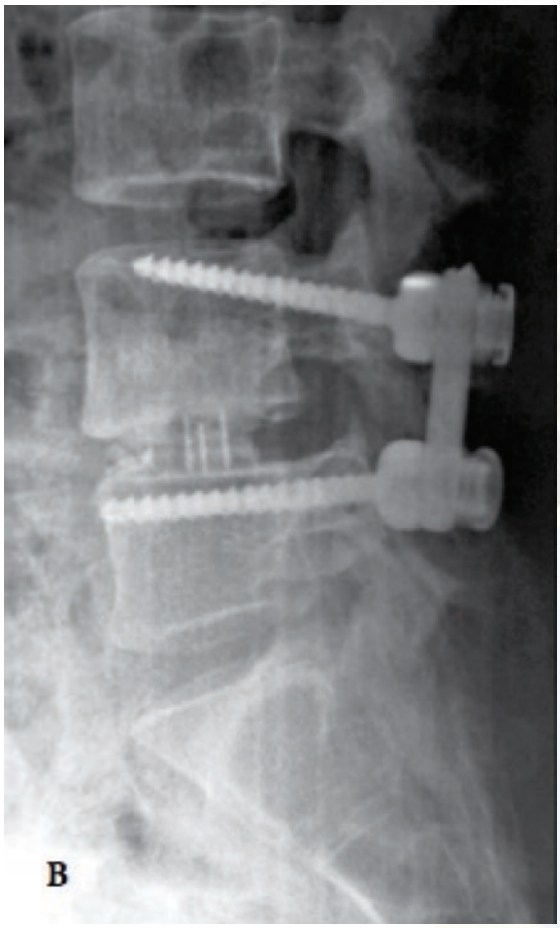
In recent years, there has been an increasing interest in minimal or less invasive techniques in spinal surgery due to the numerous potential advantages including reduced length of stay at hospital, minimal blood loss and requirements for post-operative analgesia as well as earlier return to work. In this study, we describe a new technique for mini-open transforaminal lumbar interbody fusion (MO-TLIF) using a single-sided pedicle screw in the surgical treatment of degenerative disc disease and lumbar instability. The indications and the steps of the technique are described in detail. Although the available data reflects from a limited number of cases, we believe that it is a feasible procedure which may be more advantageous in terms of short operation time, less invasion, less blood loss, and fast recovery.

Keywords: Mini-open, lumbar interbody fusion, unilateral fixation

Figure 4-B



Lateral direct x-ray demonstrating that fusion tissue and pedicle screws are in optimal position.

Poster Bildiriler

PP-036

DO WE NEED TO CHANGE SURGICAL COVER IN SPINAL SURGERY CASES THAT LAST MORE THAN THREE HOURS?

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AIM: Infection in spine surgery is a devastating complication which delays recovery period and effects quality of life in patients. Prolonged operative time (>3) is one of these risk factors. Many experienced spinal surgeons are aware of the fact that the surgical cover change in long-standing surgeries reduces the risk of contamination during surgery. The aim of this study is to investigate the surgical dressing contamination in long standing (>3 h) spine surgery.

METHODS: Data of 94 patients undergoing spine surgery were analyzed. 26 of 94 patients were excluded because of the surgery time. 68 patients undergoing spinal surgery more than 3 hours were included in this study. All of the surgeries were posterior approach. The patients were operated by the same spine surgeon. The patients were divided into groups (Group A/B). Swap culture was taken from surgical field before and after skin sterilization. After the surgical field was sterilized and dressed, swab cultures were taken from the sides of the skin incision, from the drape edges around the incision and from the deep subcutaneous tissue every 30 minutes respectively. The surgical cover was not changed during the surgery in Group A. The same cultures were taken but surgical cover was changed every 3 hours in Group B.

RESULTS: There were 34 patients in Group A and 34 patients in Group B. The average age of patients in Group A was 48.7 (18-76) and 46.2 (18-72) in Group B. The diagnosis of patients in Group A were scoliosis (7 patients), lumbar spinal stenosis (17 patients), revision surgery (5 patients) and tumor (5 patients). The diagnosis of patients in Group B were scoliosis (8 patients), lumbar spinal stenosis (16 patients), revision surgery (4 patients) and tumor (6 patients). The average surgical time in Group A was 4.84 h (3.5-8) and 4.92 h(3.5-8.2) in Group B. There was no reproduction in both groups in their culture.

CONCLUSION: Sterilization of surgical field and instrumentation is the most important patient independent factor. Appropriate soft tissue dissection and the same experienced surgical team participating in surgeries are also important factors related with decreased infection rates in spine surgery. Surgical cover change may be required as a traditional experiential approach at hospitals where different doctors participating to surgery for education but according to the results of our work there is no need to change surgical cover in spinal surgeries that last more than 3 hours.

Keywords: contamination, infection, spine surgery, surgical cover

Poster Bildiriler

PP-037

UCAR CONVEX ROD ROTATION TECHNIQUE FOR LENKE 5 ADOLESCENT IDIOPATHIC SCOLIOSIS

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AIM: The objective of this study was to analyze the effect of the Ucar convex rod rotation technique in the treatment of Lenke type 5 adolescent idiopathic scoliosis.

PATIENTS and METHODS: A total of 6 patients with Lenke type 5 adolescent idiopathic scoliosis managed with Ucar convex rod rotation technique in 2018 were included. The average patient age was 14 years at the time of surgery. Measurements of curve magnitude and balance were made on standing anteroposterior and lateral radiographs were taken before surgery, postoperatively, and at the last follow-up to assess deformity correction, spinal balance. Surgical Technique: Firstly, the pedicle screws were inserted on convex side of lumbar curve. Secondly, the pedicle screws were inserted on convex side of thoracic curve. Two rods were placed in the thoracic and lumbar convex sides. Plugs were applied between the screws and the rod but not tightened. Thoracic and lumbar convex sides were both rotated together toward the convexity of the curve with ucar convex rod rotation technique. After tightening the plugs on convex side we inserted screws on both concave side easily.

RESULTS: The preoperative coronal plane major curve of 62° was corrected to 15° showing a 76% scoliosis correction. The average preoperative T4-T12 thoracic kyphosis was 19°, and improved to 25°. All patients after surgery showed their baseline neurologic status. No complications were observed in the patients in postoperatively.

CONCLUSION: In conclusion, this is a report about a method for surgical correction of lenke type 5 adolescent idiopathic scoliosis, which allows a three-dimensional correction. In this study, our technique has shown good correction of the coronal curve and apical derotation.

Keywords: lenke5 scoliosis, convex rod rotation, scoliosis correction

Figure 1

Perop Ucar Technique Views & Preop and Postop Xrays

Poster Bildiriler

PP-038

CLINICAL RESULTS OF PATIENTS WITH SPINAL PLAZMOSITOMA AND MULTIPLE MYELOMA

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Plasma cell neoplasms are a group of entities characterized by the neoplastic proliferation of plasma cells. These tumors occure commonly as a single lesion (solitary plasmacytoma: SP) or as multiple lesions (multiple myeloma: MM). The spine is a common site of involvement. Spinal cord compression and vertebral compression fractures are the main complications, which require surgery for decompression and/or stabilization or augmentation. The aim of this study is to review the results of 20 cases of spinal plasmocytoma and multiple myeloma.

There were 11 male and 9 female, aging between 11 and 78 years old (mean: 54.3) There were 8 SL and 12 MM. 15 cases presented with low back pain, two with neck pain, and one presented with back pain. Low extremity wekness and numbness were the major symptom in 2 cases.

Pathology was located in the lumbar spine in 8 cases, in the thoracic spine in 6, in the cervical spine in 3, in the sacrum in 2, and in the lumbosacral spine in one case. Based on the result of biopsy, 5 cases underwent decompression and stabilization, and two cases underwent vertebral augmentation.

A percutaneous biopsy was performed in 10 cases, decompression with or without stabilization in 5 cases, and biopsy and augmentation (VP/KP/sacroplasty) in 4 cases, and biopsy, decompression and augmentation was performed in one case.

Additionally, 8 cases underwent radiotherapy, 13 cases chemotherapy, 8 cases underwent both radiotherapy and chemotherapy. The follow-up ranged between 1 month and 120 months. Two cases died due to complications.

The choice of modality for definitive treatment depends on many factors, including the presence of absence of spinal instability, the degree of spinal cord compression, and the relative radio sensitivity of the tumor. Surgery and radiotherapy are the primary approaches to treat tumor compressing the spinal cord.

Keywords: plazmositoma, multiple myeloma, plasma cell neoplasms

Poster Bildiriler

PP-039

COMPARISON THE RESULT OF CLASSICAL KYPHOPLASTY SYSTEM WITH 11 GAUGE FAST WORKING CANNULA KYPHOPLASTY SYSTEM

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INTRODUCTION: Percutaneous kyphoplasty (PK) is a proven minimal invasive surgical method that has been used for the treatment of osteoporotic vertebral compression fracture since 1998. Surgery is traditionally performed as follows; Under the guidance of the C-arm, the Jamshidi needle is passed through the pedicle, then the guide wire is placed through the Jamshidi needle, after the removal of the jamshidi needle the working cannula is placed with the help of the guide wire. When the placement of the working cannula achieved, the balloon is placed and inflated after the removal of the balloon the cement is injected. Different then this traditional method, the use of the thick Jamshidi needle (11 Gauge Rapid work cannula), makes unnecessary the steps of the placement of the guide wire and the replacement of the jamshidi cannula with the working cannula, the kyphoplasty balloon and the bone filler could inserted through the same thick jamshidi needle. The aim of our study is to compare the result of the classical kyphoplasty (CK) system with 11 gauge fast working cannula kyphoplasty (FWK) (system.

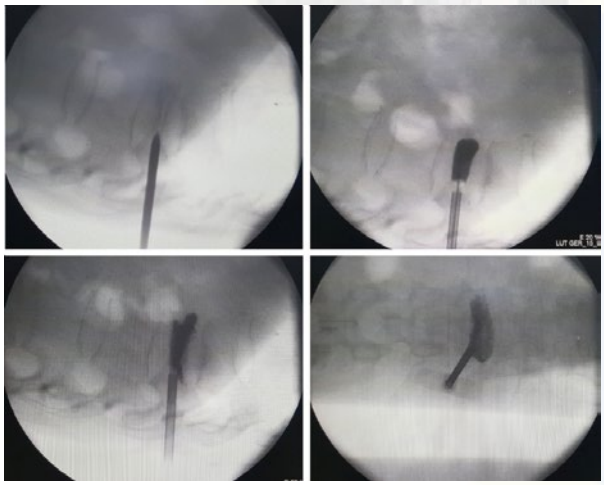
MATERIALS AND METHOD: This retrospective study included 68 patients (20 women and 48 men) who underwent percutaneous kyphoplasty (PK). The mean age was 72.3 years (range, 57-84). Of the 68 patients 8 patients had multiple vertebral fractures, PK was performed on 76 vertebrae, in 42 vertebrae CK, in 34 vertebrae FWK were preferred. The fractured vertebrae levels were 36, 11, 2, 1 and 26 for upper lumbar, lower lumbar, upper, middle and lower thoracic vertebrae respectively.

RESULTS: All procedures were made under local anesthesia and by the unilateral approach technique. We couldn't find any significance differences between the CK and FWK methods in terms of complication rate and midline invasion. The mean operative times were found as a 45,2 min. for CK and 37.2 min for FWK.

CONCLUSION: Our study reveals that; the FWK is superior to CK in term of the operative time, also In addition, during the placement of the working cannula through the guide wire, using of the hammer can lead to the possibility of pedicle injury, misdirection or pain, the FWK can prevent such these complications.

Keywords: percutaneous kyphoplasty, unilateral, thick jamshidi needle, 11 gauge

Resim-1



Poster Bildiriler

PP-040

IMPORTANCE OF POSTOPERATIVE AND FOLLOW-UP INFORMATION ON PREDICTION OF MECHANICAL COMPLICATIONS

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PURPOSE: Multifactorial etiology and high rate of mechanical complications warrant predictive models to aid the complex decision making process for proper patient selection. A 4-layer predictive model was conducted to assess the effects of patient factor (PREOP), surgical decision (OP), surgical execution (POSTOP) and time (FUP) in prediction of mechanical complications.

MATERIAL-METHODS: Inclusion: ≥4-level fusion. 163 features were included at PREOP (80 history, demographic, radiographic and PROM data), OP (41 technique and implant-related data), POSTOP (27 radiographic data) and FUP layers (25 f-up duration and PROM data) to predict mechanical complications: PJK/PJF, DJK/DJF, rod and implant-related. Support Vector Machines, Random Forests with an 80/20 train-test split and Multilayer Perceptron were used. Models were run with and without feature selection. Performances of the models were compared using accuracy, sensitivity, specificity, PPV and NPV at each layer.

RESULTS: 457 pts (362F, 95M, 53±19 years) with a mean f-up of 39.3 (24-94) months were included. Age, pelvic fixation, ODI score and BMI were amongst the most important features in PREOP and OP layer predictions, where the lowest PPV in the test samples was 59.1%. While the rest of the features remained in the models, sagittal plane reconstruction and duration of f-up became more important, significantly increasing predictive ability. Sagittal plane reconstruction quantified by the postoperative GAP Score was the most important feature scoring far higher than the next closest feature in feature selection.

CONCLUSIONS: Prediction of mechanical complications using preop and op data has low positive predictive value, clouding preoperative patient selection reliability, where up to 40% of the patients who might potentially benefit from such surgery may be deemed inappropriate for having it. Among 163 features, postop data including sagittal plane reconstruction emerge as the most important feature emphasizing the importance of proper surgical planning and execution.

Keywords: machine learning, adult spinal deformity, prediction

Poster Bildiriler

PP-041

CLINICAL OUTCOMES AND CHANGES OF POSTOPERATIVE SEGMENTAL, REGIONAL AND GLOBAL ALIGNMENT PARAMETERS IN SCHEUERMANN KYPHOSIS PATIENTS WITH POSTERIOR İNSTRUMENTATION

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MATERIALS-METHODS: In this study, 60 patients having the inclusion criteria of the study, operated by the Orthopedics and Traumatology Clinic in Baltalimanı Bone Disease Training and Research Hospital between January 2006 and June 2017, were diagnosed. 60 patients included in the study was conducted only posterior instrumentation and fusion surgery. Coronal Cobb angle and sagittal parameters were evaluated statistically on preoperative graphs and on graphs of 0-4th weeks, 6th months and last control after surgery. SRS-22 and SF-36 scores were calculated and compared preoperative and last control after the operation.

RESULTS: The study included 19 female and 41 male patients at the average 17,9 (12-32) years. Their average follow-up period was 46,2 (12-131) months. C7 slope, T1 slope and C2-C7 SVA values of cervical segmental and regional parameters were significantly higher than preoperative values ($p < 0.05$). The postoperative decrease in cervicothoracic junction angle was statistically significant ($p < 0.05$). Thoracolumbar alignment and lumbar lordosis were significantly decreased in postoperative period ($p < 0.05$). PR-S1, PR-T12 angles, SVA, T1SPI, T9SPI and spinal tilt angles obtained at postoperative control were significantly lower than preoperative values ($p < 0.05$). PJK and RCA angles at the second and third controls were significantly higher than in the early postoperative evaluation ($p < 0.05$). The positive change in all sub-group in the SRS-22 (r) evaluation scale in postoperative period was statistically significant compared to the preoperative period. No significant difference was found in physical health and emotional problems in SF-36 score ($p > 0.05$). But there were significant differences in other subgroups of SF-36 form ($p < 0.05$).

CONCLUSION: Restoration of impaired sagittal balance provides improvement in pain, cosmetic complaints, social life and quality of life. A good understanding and analysis of the sagittal balance, which includes segmental, regional or global alignment in SK patients, is critical in achieving clinically good results. Recently defined global alignment parameters are important indicators in assessing sagittal profile in patients with SK. As there are limited number of studies on global and sagittal cervical alignment parameters in patients with SK in the literature.; the data obtained from this study contributes to the literatüre.

Keywords: Scheuermann Kyphosis, Sagittal Balance, Global Alignment

Poster Bildiriler

PP-042

CARBON FIBER ROD SYSTEM IN SEGMENTAL SPINE STABILIZATION

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Transpedicular screw rod system is the main system currently used in spine stabilization. The structural components of the system are made of titanium-aluminum-vanadium alloy. Metal fatigue and instrument failure are the pitfalls of this material which are caused by long-term repetitive and sequential movements. In our study, rod systems of carbon-fiber composite which are developed and produced by us will be compared to titanium rods, in terms of mechanical strength and bio-compatibility.

Mechanical tests; are done as a tensile breaking test and transverse perpendicular compressive test with the Shimadzu autograph 1000-S which is capable of applying 10 kN force. 10 cm height and 5.5 x 45 mm dimensioned 5 carbon-fiber rods were compared to the standard titanium rods with the same number and dimensions. Each sample remained under the load at the speed of 5 mm / min. The mean value was determined in each group and statistical significance was investigated. In the tensile breaking test, the breaking point of titanium rods was approximately 6400 N/cm2; in the carbon fiber group, this value was found as 7800N/cm2 and the difference was statistically meaningful. In the transverse perpendicular compressive test, the mean breaking value of titanium rods was only 3800N, while it was 6900N in the carbon-fiber rods group which shows evident statistical difference. In vitro, bio-compatibility tests from the cytotoxic aspect: samples from the titanium and carbon-fiber group were cut to one inch. These materials were incubated in commercially obtained stem cell culture at appropriate conditions for 6 weeks. Then, under the light microscope, these materials were evaluated with forty magnification and hematoxylin and eosin staining. Meanwhile, cell clustering, necrotic and live cell numbers were compared in both groups. Last but not least, there was no statistical difference. In this untrodden field, our study demonstrates for the very first time that the carbon-fiber rod is mechanically much more resistant than its titanium equivalents and it does not develop cytotoxicity at all.

Keywords: Carbon-Fiber, Rod, Spinal Stabilization

Poster Bildiriler

PP-043

DIASTEMATOMYELIA WITH SPINAL DEFORMITY: 14 CASES

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AIM: Diastometamyelia is a rare congenital malformation of the spinal cord. The different lengths of the spinal cord, depending on the primary embryological malformation, is divided into two parts with equal or unequal diameters. The presence of bone septum on X-ray and CT and the presence of medulla spinalis on two separate halves on MRI are valuable in the diagnosis. Surgical treatment is the removal of the bone by the dural sheath around the septum or fibrous band and closing the dura at the posterior. The incidence of diastometamyelia in congenital cases (congenital kyphosis, congenital scoliosis, congenital kyphoscoliosis) is 16%.

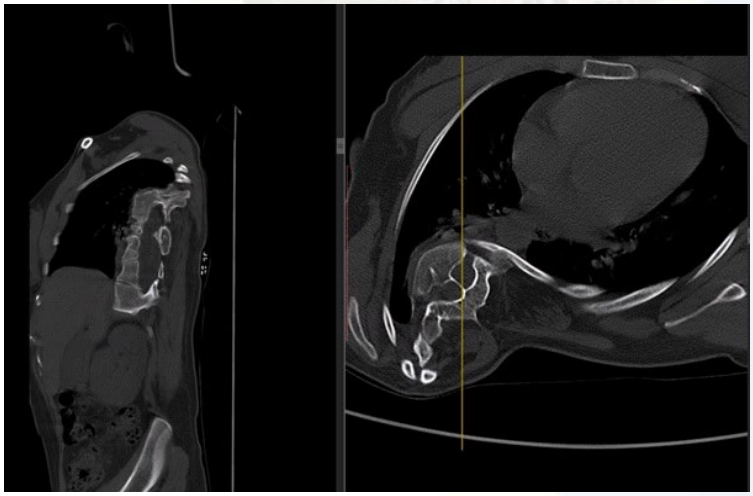
METHOD: Fourteen patients with deformities who were operated in our clinic between January 2009 and January 2019 were evaluated retrospectively.

RESULTS: Nine of the patients were female and 5 were male. The ages ranged from 10 to 44 years, with a mean age of 26.4 years. Fourteen patients were type I with diastometamyeli. 6 patients had scoliosis (Figure 1) and 8 patients had kyphoscoliosis. Urodynamic tests were performed in all cases. In all cases, bone spicule was excised, and arachnoidal adhesions were released by microsurgical methods. Dura was turned into a single tube. In 4 cases, the thick and tense phylum terminal was cut in the same session. Three months after the surgery, deformity surgeries were performed.

CONCLUSION: In order to rule out midline closure defects in all cases of deformity, we consider the craniocervical junction and all spinal MRI. First of all, diastometamyelia surgery should be done by cutting the stretched and thick filum terminal if we have to do definitive deformity surgery in 2-3 months following. In the case of severe scoliosis, we recommend a two-stage surgery. We should keep in mind that these patients can be active individuals who do not need help in daily life with early surgery and good rehabilitation.

Keywords: Diastematomyelia, congenital scoliosis, congenital kyphosis, spinal deformity, surgery.

Figure 1



Preoperative (a), postoperative (b) thoracic CT of the patient with bone spicule + diastometamyelia and scoliosis at the T8 level.

Poster Bildiriler

PP-044

INVESTIGATION OF THE ROLE OF FACET JOINT ANGLE FEATURES IN THE DEVELOPMENT OF SPONDYLOSIS IN PATIENTS WITH LUMBAR SPINAL STENOSIS CANAL

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OBJECTIVE: The aim of this study was to investigate facet tropism and the role of facet tropism in stenosis canal development in patients with lumbar spinal stenosis canal (LSSC).

MATERIAL-METHOD: Between October 2016 and November 2018, 67 patients with lumbar spinal stenosis canal between the ages of 29-83 years and 51 patients with normal lumbar MRI in the control group had bilateral facet joint angles in axial plane at L3-4, L4-5, L5-S1 It was measured. If the difference between the two facet joint angles is <6 °, there is no tropism, moderate tropism is between 6 ° -12 °, and severe tropism is> 12 °.

RESULTS: A total of 708 facet angles were measured 402 facet angles in 67 patients with lumbar spinal stenosis canal and 306 facet angles in 51patients with control group. L3-4, L4-5, L5-S1 right and left facet joint angle differences were significantly higher in LSSC group than control group. The facet tropism for all three distances was significantly higher in the LSSC group than the control group. As the lower distances were reached, the mean angle of facet joint angle was significantly increased in both the LSSC group and the control group.

CONCLUSION: The facet joint tropism disrupts the proportion of the load distribution in the lumbar region and accelerates the degeneration. Facet joint tropism is seen in LSSC patients and we think that facet tropism has a role as a predisposing factor in the etiology of LSSC.

Keywords: LSSC, Facet Joint, Computed Tomography, Facet Tropism

Poster Bildiriler

PP-045

SUBFASCIAL DRAINAGE AND CLIPPING TECHNIQUE FOR TREATMENT OF CSF LEAKS FOLLOWING SPINAL SURGERY

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AIM: To treat iatrogenic CSF leaks developing after degenerative lumbar spinal surgery with subfascial drainage and clipping (SDC) technique.

Material METHOD: This study retrospectively reviewed the medical records of 41 patients who developed iatrogenic cerebrospinal fluid (CSF) leak after being operated with degenerative lumbar spinal surgery at Ankara Oncology T.R.H and Ankara Private Liv-Ankara MedicalPark Hospital between 2007 and 2018. Of these, 22 were operated with the SDC procedure whereas 19 were not (control group). The outcomes were compared between the two groups.

RESULTS: CSF leak stopped on 6-9th days in average after the procedure in the SDC group, and no infection developed. In the control group, the CSF leak was conservatively controlled in 13 patients. CSF leak could not be controlled in six patients and lumbar external drainage was performed. Among these patients, CSF leak was controlled by lumbar external drainage whereas the other three patients were operated on to repair the dura defect. No infection occurred.

CONCLUSION: The SDC technique is effective for treatment of iatrogenic CSF leaks that develop after degenerative lumbar spinal surgery. We encountered no other study in the literature that specifically focused on the use of the subfascial drainage and clipping technique to treat CSF leaks that develop after degenerative lumbar spinal surgery.

Keywords: cerebrospinal fluid leaks, spinal surgery, pseudomeningocele

Poster Bildiriler

PP-046

IS IT POSSIBLE THAT UNILATERAL BI-PORTAL ENDOSCOPY SHALL BE AN ALTERNATIVE METHOD AT TRADITIONAL SPINE SURGERY? SHORT TERM UBE RESULTS AT LUMBAR DISC PATHOLOGIES AND STENOSES

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AIM: In order to determine whether UBE can be an alternative way of treatment at different pathologies or not, 126 patients were evaluated retrospectively between October 2017 and October 2018.

MATERIAL-METHOD: The average age of patients was 55 and 56% of them was woman while 44% was man. 26% of cases were discectomy, 43% was santral or lateral stenosis, 15% revision, 16% foraminal approach. We suggested 2 different evaluation frame to patients for results. ODI scoring was performed for early post operative and quarterly periods. Later on, we performed ODI scoring for all patients who are in same category.

RESULTS: The highest rate of complication was noted at santral or lateral stenosis cases with 3%. Majority of complications are sourcing from hematom and recurrence. The average duration of operation for each level was 41 mn. The average hospital stay for each case was 0,7 days. Bleeding was noted less then 10 cc at cases which is inflow-outflow irrigation fluid followed carefully. According to results, there was decreasing trend at ODI scoring on discectomies from 61% to 8% while from 46% to 12% on stenosis and from 47% to 9% on revisons. In post-op short term, pain and disability scoring was decreasing however there wasn`t any significant changes at quarterly period. Regarding patient satisfaction, UBE was very effective at preop ODI scoring that was 51,3% while post-op ODI scoring was 10% at end of the one year. The 1,7% of the patients were under-taken to revision surgery. 6 patients had backache more then 1 week due to short term hematom. Although there was more then 1 sequential decompression on stenosis cases, we didn`t perform stabilization to any of them that doesn`t have instability. We performed endoscopic interbody cage insertion and percutan screw stabilization for 14 patients who had prior instability.

CONCLUSION: UBE (Unilateral Bi-portal Endoscopy) is very effective method on all kind of spinal diseases that included instabilities without infection, tumor or gross deformity and B & C types fractures that are not having regional and global alignment problem, there is no penetration with vertebral column and retroperitoneum or chest cavity.

Keywords: Endoscopic spine surgery, unilateral biportal endoscopy, minimal invasive spine surgery, disc pathologies, lumbar spinal stenosis

Poster Bildiriler

PP-047

A RARE DEFISIT AFTER ISOLATED L1 BURST FRACTURE: ISOLATED SPHINCTER ANI EXTERNUS DENERVATION

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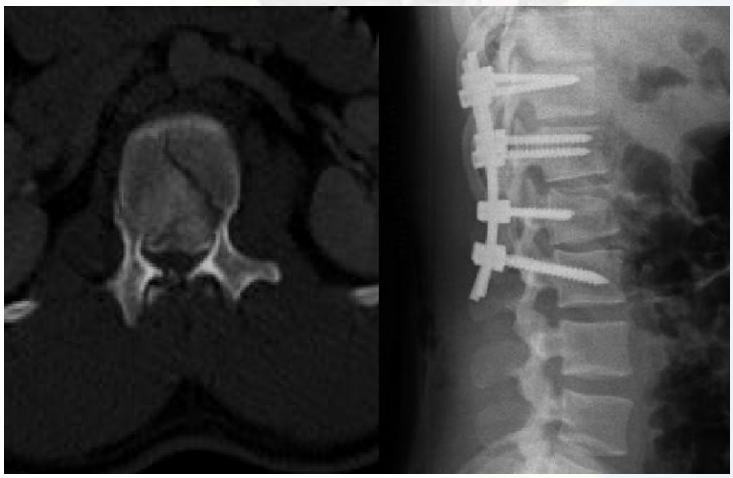
INTORUDCTION AND AIM: Vertebral fractures are serious injuries that mostly occur after high energy traumas and are most frequently seen in thoracolumbar junction. Fractures indirectly occur after sudden acceleration and deceleration forces acting on the vertebral column resulting from a combination of flexion extension mechanisms, torsional, compressive, translational, or distractive forces. Direct fractures occur as the affecting force injures the vertebral column and medulla spinalis. Deficits are seen in 40% of cervical injuries while deficit rate in thoracolumbar injuries is 10-38%. Our aim in presenting this case is to state that atypical neurological deficits can also be seen in spinal trauma patients except the well-known clinical syndromes. Therefore, we underscore the importance of detailed neurological examination before and after surgery.

RESULTS: A 17-year-old male patient was evaluated by the emergency department after sustaining an injury by being blown into the air and falling from a height of approximately 2 meters while inflating a flat tractor tire. The patient was diagnosed with L1 burst fracture. Lower extremity muscle strength and sensory examination, perianal sensory examination and anal sphincter tone were normal. Short segment posterior instrumentation was performed. Patient complained from numbness in the lower extremity on the first postoperative day, and high-dose steroid protocol was initiated. Muscle strength examination was normal. The patient had no complaints in the lower extremities on the postoperative day 3 but stated that he had difficulty in anal continence and had no urinary incontinence. Anal EMG taken after the necessary consultations was reported as sphincter sudden externus partial denervation. Polyclinic control was recommended to the patient by general surgery. During follow-up, lower extremity muscle strength was found to be 5/5, and his complaint of anal incontinence continued.

CONCLUSION: The preoperative and postoperative neurological examination of the patient should be done in detail after vertebral injuries. It should be kept in mind that in spinal cord injuries such as conus medullaris syndrome, anterior cord syndrome, posterior cord syndrome, and Brown-Sequard syndrome, atypical deficits may take place as well as known clinical syndromes.

Keywords: Burst Fracture, Neurological Deficit, Anal Incontinence

resim 1



Poster Bildiriler

PP-048

CERVICAL SAGITTAL ALIGNMENT AFTER POSTERIOR SURGERY OF THORACIC HYPERKYPHOSIS

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PURPOSE: In thoracic hyperkyphosis patients compensatory alignment changes occur in cervical and lumbar regions. However the changes in cervical sagittal alignment (CSA) are not uniform and may be seen as cervical lordosis or kyphosis. The effect of posterior correction surgery on CSA also remains unclear. Our aim in this study was to assess the changes in CSA after posterior instrumentation and fusion (PIF) in thoracic hyperkyphosis.

METHODS: Whole spine lateral radiographs of 32 patients with thoracic hyperkyphosis that were treated by PIF were retrospectively analyzed. Exclusion criteria included patients with tumors, infections, traumatic spine pathology, and those who had revision surgery. In the surgical technique, after segmental pedicle screw instrumentation wide facet resection and Ponte osteotomies were performed at apical region. Correction of the deformity was accomplished by cantilever bending maneuver. Patients were evaluated preoperatively and postoperatively at final follow-up. Evaluated parameters were preoperative and postoperative T2-T12 kyphosis angle, T1 slope and C2-C7 lordosis (Figure 1).

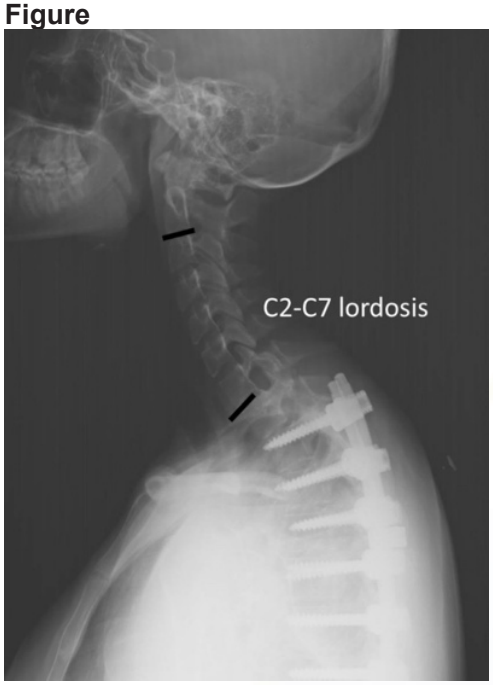
RESULTS: 14 of the patients were female and 18 were male. Mean age was 21.7 (range: 14-37). Mean follow-up period was 32 months (minimum 24 months). For all patients upper instrumented vertebra was T2. Mean number of fused levels was 13.3. Mean preoperative T2-T12 kyphosis angle was 78.7°, which decreased to 43.8° postoperatively. T1 slope decreased from 38.4° to 29.7°, while C2-C7 lordosis decreased from -6.5° to -3.8°. Preoperatively 23 patients had lordotic CSA, while 9 had cervical kyphosis. Postoperatively 18 of patients which had preoperatively lordotic CSA preserved their lordosis, while 5 patients developed cervical kyphosis. 9 patients with preoperative cervical kyphosis remained in kyphotic CSA (Table 1).

CONCLUSION: Thoracic hyperkyphosis affects CSA randomly. In some patients cervical lordosis is increased, while others have cervical kyphosis. Postoperatively decreased thoracic kyposis causes decreased T1 slope and kyphotic changes in CSA, both in preoperatively lordotic and kyphotic CSA groups.

Keywords: Thoracic hyperkyphosis, posterior instrumentation, cervical sagittal alignment

Poster Bildiriler

Figure **1**



Postoperative lordotic CSA.

Figure 1

	Postop CL n=18	Postop CL n=18	Postop CL n=18	Postop CK n=14	Postop CK n=14	Postop CK n=14	Post-op CK n=14
	Preop CK n=0	Preop CL n=18	Preop CL n=18	Preop CK n=9	Preop CK n=9	Preop CL n=5	Preop CL n=5
		preop	postop	preop	postop	preop	postop
T2-T12 kyphosis (degrees)		77,8	42,9	81,2	49,4	77,3	36,8
T1 slope (degrees)		46,1	35,8	42,3	27,8	37,5	32,4
C2-C7 lordosis (degrees)		-6,8	-4,1	3,2	5,7	-4,4	4,2

Radiographic values.

Poster Bildiriler

PP-049

THE CLINICAL OUTCOMES OF PLATE FIXATION TECHNIQUES AFTER THORACOPLASTY IN SEVERE SCOLIOSIS PATIENTS

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Thoracoplasty procedure is frequently preferred procedure with spine fusion in idiopathic scoliosis surgery. The indication to thoracoplasty is severe posterior rib hump rib cage deformity in scoliosis patients. Postop pain severity and medicine requirement are higher compare to without thoracoplasty cases.

AIM: The aim of this research has been to investigate plate fixation technique results, patients' clinical and medical condition, pain degrees.

MATERIALS-METHODS: We retrospectively reviewed 21 latest severe deformed adolescent idiopathic scoliosis patients, who underwent thoracoplasty procedure as part of posterior scoliosis correction surgery. The patients were evaluated on two groups in terms of rib fixation technique: traditional suture technique (A group) and novel plate fixation technique (B group) groups. The patients' clinical medical condition and pain degree were assessed with a Visual Analogue Scale (VAS) questionnaires. The minimal follow up for this study was 6 months (6-24 months). The minimal curve severity was 80 degrees (80 to 145 degeree) and three column ostetomy performed cases are not included to this reseach. The information as patients' medical condition prescribing records, list and amount of used medicine were included in research materials.

RESULTS: The average hospitality day in clinic was appropriately 7 days and 4 days due to pain control. Patients needed parenteral NSAID for 10 days and 3 days after discharge. The right side pain VAS scores were 7 scores and 3 scores at day 1 after surgery. The breathing difficulties due to right side rib pain were only on A group. The rib crepitations and sounds had felt only on A group.

CONCLUSIONS: The thickness plate fixation after thoracoplasty from stable fixation and this decrease postop pain and medical costs. Because of good pain control and absolute fixation plate fixation technique allows performing spinal correction and thoracoplasty on the same stage. Because of good pain control and absolute rib fixation the plate fixation technique allows performing spinal correction and thoracoplasty on the same stage without lengenting hospitality days.

Keywords: deformity, ribhump, scoliosis, surgery, thoracoplasty

Poster Bildiriler

PP-050

EFFECTIVENESS OF PLACEMENT OF SCREW INTO THE FRACTURED VERTEBRA IN THORACOLUMBAR BURST FRACTURES

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INTRODUCTION: Posterior approach may be prefered using transpedicular screw fixation (TSF), with or without screw placement into the fractured vertebra in thoracolumbar burst fractures (TBFs). In this study, radiological results of both techniques, stabilization with or without screw in the fractured vertebra, were reviewed.

MATERIALS and METHODS: Radiological images of 60 cases who underwent surgery for TBFs were reviewed retrospectively. Surgical procedure included TSF, with or without screw into the fractured vertebrae. Cases were categorized as Group 1, cases with screw, and Group 2, cases without screw in the fractured vertebra. Radiological assessment was performed to measure anterior (AVHR), middle (MVHR), and posterior (PVHR) vertebral height ratio. Furthermore, interpedicle distance of fractured vertebra (IPD), spinal canal occupation rate (SCOR), thoracolumbar Cobb angle, and local kyphotic angle (LKA) were measured.

RESULTS: There were 35 cases in group 1, and 25 cases in group 2. AVHR of fractured vertebra was found to be 68,8%,82,6% and 77,0% in cases in group 1, 55,7%, 67,8% and %58.7 in cases in group 2, before surgery and in early and late postoperative periods, respectively ($p<0.05$). When compared pre and late postoperative images, increase in AVHR in late postoperative period was found to be significant in group 1($p:0.0001$; $p<0.05$), and insignificant in group 2($p:0,115$; $p>0.05$). Cobb angle in group 1 was found to be 12.29°, 9.54°, and 11.2°; and in group 2, 15.02°, 10.99°, and 14.6° before surgery and in early and late postoperative periods, respectively ($p<0.05$). There was significant increase in Cobb angle when compared early and late postoperative images in group 2 ($p:0.015$; $p<0.05$).

CONCLUSION: This study demonstrated effectiveness of screw placement in fractured vertebra in preserving vertebral body height, IPD and Cobb angle in late postoperative period.

Keywords: thoracolumbar burst fracture, anterior vertebral height ratio, pedicle screw, fractured level

Poster Bildiriler

PP-051

LONG-TERM SURGICAL TREATMENT OUTCOMES OF CERVICAL EPENDYMOMA: RETROSPECTIVE ANALYSIS OF 18 CASES

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OBJECTIVE and BACKGROUND: Cervical spine is the most affected region of intramedullary ependymomas. Despite their usually well-circumscribed growth pattern, subtotal resection is observed in up to 44% of intramedullary ependymomas. In this study long-term surgical treatment outcomes of 18 cases of cervical ependymoma have been presented.

METHODS: Medical records of both our institutes were retrospectively reviewed in cervical tumors who operated from 2004 to 2018, and the cases which confirmed as ependymoma pathologically were obtained in this study.

RESULTS: 18 cases of cervical ependymoma were detected in 14 women “77.8%”and 4 “22.2%”men patients. The mean age was 34.3±7.9 (22-57) years. The mean follow-up period was 97.3±51.7 (9-179) months. The most common complaints were radicular pain (upper extremities pain) (77.8%) followed by local pain such as back or neck (66.7%), loss of sensation (66.7%), motor deficit (38.9%), neuropathic pain such as burning in extremities (25%), gait impairment (22.2%) and urinary incontinence (11.1%), respectively. All cases were intramedullary, and no one with multifocal presentation. Two cases (11.1%) showed recurrence after 3 months and 3 years. The mean of the time between the first complaint and surgery was 14.8±23.5 (1-84) months. The mean length of hospital stay was 6.8±9.2 (2-64) days. The complications included 2 epidural hematoma were reopered; the first patient had lost whereas the second one sent to the physical therapy and rehabilitation, 2 patients were experienced worsen motor deficits and one had surgical site infection. The choice of approach was laminaplasty in nine, laminectomy in six and three cases were underwent hemilamiectomy. Gross-total resection (> 97%) was achieved in six, near-total resection (90%-97%) was performed in seven and the rest five tumors were resected subtotally (>75%-89% of tumoral mass). The mean of bleeding loss was 590 cc. Histologically, all cases were WHO Grade II except for one female who were received RTP (followed-up for 23 months).

DISCUSSION and CONCLUSION: The cervical located ependymomas almostly seen in females (3:1). In our spinal ependymoma series, when compared to lumbar and thoracic ependymomas, the most difficult gross-total resection was achieved in cervical ependymomas. Despite there were 13 cases presented with coexistence of syrinx only gross-total resection was achieved in four patients of them. 32.1% of our spinal ependymoma cases were located in cervical spine. Postoperative MRI controls should be done especially of those experience local or radicular pains. When subtotal resection is achieved, adjuvant therapy is recommended for WHO Grade III ependymomas.

Keywords: Cervical Ependymoma, intradural-intramedullary, gross-total resection, laminaplasty

Poster Bildiriler

PP-052

COMPARISON BETWEEN THE PRE- AND POSTOPERATIVE CLINICAL OUTCOMES AND COMPLICATIONS OF THE PATIENTS WHO UNDERWENT POSTERIOR INSTRUMENTATION

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AIM: The authors aimed to evaluate the surgical outcomes in the patients who underwent posterior instrumentation for lumber spondylolisthesis by evaluation pre- and postoperative clinical results, complications, adjacent segment disease and patients' satisfaction rates.

MATERIALS-**METHODS:** This study included 62 patients were underwent posterior stabilization surgery at Neurosurgery department of BVU between the years 2016 and 2018, the patients who followed up at least 6 months and the patients who are appropriate to our study criteria were included. The patients' demographic characteristics such as age, gender, clinical presentations, complications, patient satisfaction rate, and pre- and postoperative clinical status had been evaluated using Oswestry scale and VAS scores. The patients were divided into who had underwent posterior instrumentation with transforaminal lumbar intervertebral fusion (TLIF) and others who had underwent posterior instrumentation without TLIF (control group) and the comparison had been performed between both groups using all above parameters retrospectively.

RESULTS: TLIF group included 38 patients (26 women and 12 men). No TLIF group included 26 patients (18 women and 7 men). The mean age of both groups were 57.9 (31-78) and 55.5 (28-74), respectively. The mean follow-up periods were 16.7 (6-33), and 18.7 (7-34) months, respectively. The most common symptom was leg pain (100%). The mean of preoperative leg and back VAS score were 7.6 (6-10), 8.7 (6-10) for TLIF group and 6.8 (5-10), 8.3 (6-9) for no TLIF group, respectively. The mean of postoperative leg and back VAS scores were 1.67 (0-3), 2.0 (0-3), 2.1 (0-3), and 2.4 (0-4), respectively. The mean of pre- and postoperative ODI were 63.4 (48-86), 16.8 (6-36) for TLIF group, and 59.8 (38-72), 19.8 (10-34) for no TLIF group, respectively. Adjacent segment disease was seen in one patient from TLIF group and 2 patients in others. Reoperations were applied in 3 TLIF patients and 5 no TLIF patients. One patient dead on postoperative 4th day for MI from TLIF group and another one had pulmonary embolism. Satisfication rates were 92% for TLIF group and 69% for no TLIF group. There was a significant decrease in postoperative back VAS ($p = 0.01$), and leg VAS ($p = 0.02$) values of the cases.

CONCLUSION: Posterior instrumentation with TLIF or without TLIF reduces patients compliants for symptomatic patients without significant differences. The satisfication rate was high in the TLIF group.

Keywords: Spondylolisthesis, fusion, TLIF, complications

Poster Bildiriler

PP-0053

VARIOUS NEUROMUSCULAR DISEASES REQUIRING SCOLIOSIS SURGERY

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AMAÇ: To evaluate our neuromuscular pediatric patients requiring scoliosis surgery

YÖNTEM: Thirty-six patients were identified: myelomeningocele (30), duchenne muscular dystrophy (3), cerebral palsy (1), rett syndrome (1), spinal muscle atrophy (1). Patients treated with posterior spinal fusion to the pelvis for neuromuscular scoliosis with minimum 1-year follow-up from 2012 to 2019 were reviewed. Constructs were pedicle screw fixation with iliac screw pelvic fixation. Sliding growing rod technique was used in patients under ten years old.

BULGULAR: Mean age was 10 years. Mean follow-up was 2 years (range 1-7 years). Deformity correction at final follow-up was significantly greater for both Cobb angle and pelvic obliquity in all patients. Superficial wound infections were seen in six patients of myelomeningocele cases. Our patient of Rett syndrome was followed with tracheostomy in both preoperatively and postoperatively. One of duchenne muscular dystrophy patients required tracheostomy 5 days after surgery. After three months tracheostomy was closed. The most comfortable post-operative findings are as follows; patients' bottom cleaning, standing upright, healing of pressure wounds, sitting without support, comfortable sleep

SONUÇ: Advances in spinopelvic fixation have resulted in improved deformity correction in neuromuscular patients. The quality of life of neuromuscular patients and their families increased after scoliosis surgery.

Keywords: scoliosis, neuromuscular, surgery

Figure 1

Preop Postop Xrays

Poster Bildiriler

PP-054

EVALUATION OF RADIOLOGICAL NORMAL SAGITTAL VERTEBRAL, PELVIS AND GLOBAL VERTEBRAL-PELVIC PARAMETERS IN YOUNG ADULT TURKISH POPULATION

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Global vertebral-pelvic parameters in young adult population and to evaluate the relationship between vertebral pelvic measurements.

METHODS: Sagittal vertical axis (SVA), T1 Slope, T1 spinopelvic inclination (T1SPI), thoracic kyphosis (TK), lumbar lordosis (LL), pelvic tilt (pelvic tilt) to evaluate normal sagittal vertebral, pelvis and global vertebral-pelvic parameters in young adult population PT), sacral slop (SS), pelvic incidence (PI) were evaluated. Roussouly classification was used to classify normal variation of the vertebrae, pelvis and sacrum in the sagittal plane. The relationship between pelvic incidence and lumbar lordosis, sagittal vertebral axis and T1spino-pelvic inclination was evaluated.

RESULTS: 170 people were included in the study. The mean and standard deviation values for SVA, T1Slop, T1SPI, TK, LL, PT, PI, SS values are; It was measured as 2.7 ± 3.8, 13.5 ± 7.5, -6.3 ± 7.5, 29.6 ± 9.8, 49.7 ± 12.2, 11.6 ± 7.3, 45.1 ± 12.4, 36.2 ± 8.5. According to Roussouly classification, 15.9% of the participants were classified as type 1, 32.3% type 2, 34.7% type 3, 17.1% type 4. A weak (low) relation was found between PI and T1Spi (rho = -0.256; p = 0.001). The weak (low) relationship between PI and LL (rho = 0.315) and SVA (rho = -0.125) is positive and negative respectively.

CONCLUSION: In the asymptomatic young adult group, normal variations of the vertebral column in the sagittal plane and the relationship between the vertebral pelvic measurements can be helpful in the pathological sagittal alignment and in the management of the treatment.

Keywords: deformity, sagittal balance,spine

Poster Bildiriler

PP-055

NOTOCHORD-RELATED TUMOR OF LUMBAR VERTEBRA AND SURGICAL TREATMENT WITH 'EN BLOC' RESECTION: A CASE REPORT

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BACKGROUND: Notochord-related tumors are rare bone tumors. They arise from remnants of the notochord and can be found anywhere along the spinal column and clival bone. We report a rare case of L4 vertebral body notochord-related tumor treated with anterior en bloc vertebrectomy and posterior stabilization.

CASE PRESENTATION: A previously healthy 50-year-old female patient presented with a 3-month history of progressive low back pain. She reported no history of traumatic injury. Her previous medical history was unremarkable. The straight leg raising test was 60-70 degrees bilaterally. Neurologic examination was normal. There was no motor weakness or sphincter disturbance. Blood tests, including inflammatory markers, were within normal limits. Lateral radiographs showed minimal bony destruction and osteoblastic change of the L4 vertebral body. Magnetic resonance imaging (MRI) revealed a lesion focus in the nodular form of approximately 2 cm in the L4 vertebrae corpus (Figure 1). MRI with gadolinium enhancement demonstrrated in T1A hypointense, in T2A hyperintense lesion in the L4 vertebrae, approximately 17 mm size (Figure 2). Transpedicular biopsy was performed at L4 to ensure the diagnosis, and histological examination circumstantiated that was the notochord-related tumors of L4. Based on the histological findings of chordoma, staged anterior and posterior en bloc vertebrectomy with pedicle screw fixation and fusion was planned. A L4 vertebral corpectomy and total tumor excision with L2-S1 interbody fusion and stabilization procedure were performed (Figure 3). The patient tolerated the procedure without difficulty and the pain was significantly relieved.

OUTCOMES: Notochord-related tumors of the spinal column include benign notochordal cell tumor, ecchordosis physaliphora and chordoma. Chordomas are rarely seen,slow-growing but locally aggressive tumors with high malignant potential. When it occurs in the mobile vertebra, 40% of this in lumbar region, and more than one vertebral body may be involved. The diagnosis is performed through the clinical features, physical examination and imaging. X-ray films indicate bone destruction, with areas of amorphous calcification. Computerized Tomography (CT) is used to render areas of osteolytic, osteosclerotic or mixed areas of bone destruction properly. Magnetic Resonance Imaging (MRI) with gadolinium enhancement provides the best imaging of epidural tumors and theirs characteristics, such as internal septations, cystic changes and areas of hemorrhage. The rationale of en bloc resection fort his tumor is to reduce local recurrence rate and improve survival rate.

DISCUSSION: We report a rare case of solitary lumbar notochord-related tumor that was treated with anterior en bloc vertebrectomy and posterior stabilization.

Keywords: En Bloc Resection, Chordoma, Notochord-Related Tumors, Spondylectomy, Stabilization

Poster Bildiriler

Figure 3

Post-op X-Ray, L2-S1 interbody fusion and stabilization

Poster Bildiriler

PP-056

SEVERE LUMBAR INTERVERTEBRAL DISC DEGENERATION IS ASSOCIATED WITH MODIC CHANGES AND FATTY INFILTRATION IN THE PARASPINAL MUSCLES AT ALL LUMBAR LEVELS, EXCEPT FOR L1-L2: A CROSS-SECTIONAL ANALYSIS

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BACKGROUND: Low back pain is a common public health problem associated with lumbar intervertebral disc degeneration. It is still unclear, however, whether intervertebral disc degeneration is an isolated process or accompanied by other degenerative events. We analyzed whether disc degeneration was associated with vertebral end-plate changes and fatty infiltration in the paraspinal muscles. We also aimed to identify whether the severity of disc degeneration influenced this association.

METHODS: Intervertebral disc degeneration, vertebral end-plate changes, and fatty infiltration in the multifidus, erector spinae, and psoas muscles at all lumbar intervertebral disc levels were evaluated on lumbar spine magnetic resonance images of 50 symptomatic women and 50 age-matched symptomatic men.

RESULTS: The women had greater lumbar intervertebral disc degeneration scores at L4-L5 and L5-S1 and in total. The women had more fatty infiltration in the multifidus and erector spinae muscles at L4-L5 and L5-S1. The men had more fatty infiltration in the psoas muscle at L5-S1. Patients with severe intervertebral disc degeneration were more likely to have increased fatty infiltration in the multifidus and erector spinae muscles. The rate of vertebral end-plate changes was also greater in the patients with severe intervertebral disc degeneration.

CONCLUSIONS: Severe disc degeneration in the lumbar spine is closely associated with Modic changes and fatty infiltration in the multifidus and erector spinae muscles. We suggest that disc degeneration is not an isolated event but, rather, a continuum of events that could more clearly be shown in future prospective, large sample-size studies.

Keywords: Degeneration, Disc, End-plate, Erector spinae, Multifidus, Paraspinal muscle

Poster Bildiriler

Table

Lumbar Level	Paraspinal Muscle	Fatty Infiltration Classification System	Women	Men	*P* Value
L1-L2	Multifidus	Goutallier	1.14 ± 1.07	0.82 ± 0.90	0.108
		Quartile	0.90 ± 0.81	0.78 ± 0.86	0.477
	Erector spinae	Goutallier	1.74 ± 0.75	1.72 ± 0.76	0.895
		Quartile	1.30 ± 0.68	1.16 ± 0.62	0.283
	Psoas	Goutallier	0.12 ± 0.39	0.22 ± 0.55	0.293
		Quartile	0.10 ± 0.30	0.16 ± 0.37	0.377
L2-L3	Multifidus	Goutallier	1.32 ± 0.82	1.10 ± 0.79	0.174
		Quartile	1.06 ± 0.65	0.90 ± 0.65	0.221
	Erector spinae	Goutallier	1.88 ± 0.56	1.78 ± 0.79	0.467
		Quartile	1.38 ± 0.57	1.14 ± 0.67	0.056
	Psoas	Goutallier	0.30 ± 0.54	0.38 ± 0.67	0.512
		Quartile	0.28 ± 0.50	0.28 ± 0.45	1.000
L3-L4	Multifidus	Goutallier	1.44 ± 0.73	1.36 ± 0.72	0.584
		Quartile	1.16 ± 0.58	1.00 ± 0.53	0.156
	Erector spinae	Goutallier	1.86 ± 0.64	1.76 ± 0.80	0.490
		Quartile	1.30 ± 0.65	1.18 ± 0.69	0.372
	Psoas	Goutallier	0.90 ± 0.74	1.04 ± 0.83	0.375
		Quartile	0.70 ± 0.51	0.72 ± 0.54	0.848
L4-L5	Multifidus	Goutallier	1.68 ± 0.68	1.36 ± 0.78	0.031*
		Quartile	1.26 ± 0.60	1.00 ± 0.57	0.029*
	Erector spinae	Goutallier	1.88 ± 0.82	1.78 ± 0.86	0.555
		Quartile	1.34 ± 0.72	1.24 ± 0.77	0.504
	Psoas	Goutallier	0.86 ± 0.78	1.16 ± 0.84	0.068
		Quartile	0.64 ± 0.53	0.74 ± 0.49	0.326
L5-S1	Multifidus	Goutallier	2.02 ± 0.62	1.74 ± 0.62	0.041*
		Quartile	1.46 ± 0.65	1.28 ± 0.64	0.165
	Erector spinae	Goutallier	2.46 ± 0.71	2.10 ± 0.81	0.020*
		Quartile	1.98 ± 0.82	1.62 ± 0.88	0.037*
	Psoas	Goutallier	0.94 ± 0.87	1.36 ± 0.83	0.015*
		Quartile	0.66 ± 0.59	0.86 ± 0.50	0.070

Data presented as mean ± standard deviation.
*Statistically significant.

Comparison of Female and Male Patients Stratified by Fatty Infiltration in the Multifidus, Erector Spinae, and Psoas Muscles

Poster Bildiriler

PP-057

SCOLIOSIS IN CEREBRAL PALSY

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INTRODUCTION: Spinal deformity affects 50% to 75% of children with severe cerebral palsy (CP) patients. Severity of scoliosis is directly proportional to gross motor function and is associated with other orthopaedic affections more often. The timing and sequence of interventions to spine and extremities are of great importance. Thus increases the challenge to caregivers.

AIM: The aim of this study is to outline orthopaedic and medical problems in CP patients with scoliosis and subsequent orthopaedic intervention along with spinal operation.

MATERIALS and METHOD: Patients with scoliosis were selected from multidisciplinary CP outpatient clinic in Dokuz Eylul University Hospital. A retrospective chart review was conducted. Coronal and Sagittal Cobb measurements were carried out in CP patients. CPCHILD questionnaire was send to caregivers to evaluate caregiver perception. Descriptive statistics were used and correlation analysis was done.

RESULTS: We have identified 38 CP patients (23 males/14 females) with scoliosis. Of those 73% were Gross motor function classification system (GMFSC) 4 and 5. Mean age was 14,3 ± 6,2. (mean age at latest scoliosis X-ray was 12,3 ± 5,7). Curves types were classified according to anatomical locations of the apex. There were 20 thoracic, 19 Thoracolumbar and 13 lumbar curves. Pelvic tilt accompanied in 24 (63%) of the patients. Coronal Cobb angles were 38,1 ± 15,9 degrees at thoracic, 52 ± 30,1 degrees at thoracolumbar and 30,9 ± 20,6 degrees at lumbar region. (TL curves were significantly greater than thoracic curves p=0,043) There were more severe curves in GMFCS 4-5 at thoracolumbar area but was not statistical significant (p=0.063). Lumbar lordosis was less in GMFCS 4-5 than GMFCS 1-3 (-22 and -46.5 respectively). Also sitting or standing values differed significantly from side lying lordosis or kyphosis values. Medical or other system affections were seizures in 6, PEG in 3, IT baclofen pump 3, autism in 1, blindness in 1 patient were encountered. 14 patients had undergone multilevel soft tissue release and or osteotomies. 4 patients had undergone scoliosis surgery.

CONCLUSION: Scoliosis requiring surgical interventions are frequent among GMFSC 4 and 5 CP patients, and surgical procedures for extremities are also frequently required. Surgical interventions to extremities must be carefully addressed usually before spinal operations for an optimal care to these patients.

Keywords: Cerebral palsy, scoliosis, Gross Motor Function System Classification

Poster Bildiriler

PP-058

TREATMENT AND SURGICAL OUTCOMES OF CERVICAL SYRINGOMYELIA: RETROSPECTIVE EVALUATION OF 48 PATIENTS

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OBJECTIVE and BACKGROUND: Syringomyelia is the condition of accumulation the fluid within the center of the spinal cord or within the extracanalicular area that expands the diameter of it. Even there are many idiopathic cases, there are several causes lead to occuring syringomyelia. The current study evaluates the surgical treatment outcome of consecutive 48 cervical syringomyelia patients who undergone surgery at our institution.

METHODS: Fourty-eight (32 women, 16 men) patients were presented with syringomyelia and operated between the years 2004 and 2015. First, cause of syringomyelia was investigated using craniospinal MRI then the main cause (such as congenital malformations, iatrogenic or tumor) was treated surgically. Postoperative first, third and sixth month MRI were performed. If syrinx cavity was regressed and complaints were relieved no additional surgical interventional carried out. Otherwise, syringomyelia was treated surgically. The mean follow-up period was 109.7±24.8 (18-166) months. The mean age of the patients was 36.8±17.1 (18-64) years.

RESULTS: The most common complaint was hemiparesis (72.1%). The mean period from first complaint till referring to our hospital was 8.3 months (15days-36months). The causes of syringomyelia were chiari malformation (29), intramedullary spinal tumors (11), idiopathic (2), traffic accident (2), spondylitis (2), arachnoiditis (1) and meningitis (1). Syrinx locations were in cervical only (41) and cervicodorsal (7). 9-year survival rate was 100%. Morbidity rate for syringomyelia was 47.1%. The most complication was CSF leakage (seen in 4). 42 patients were underwent surgical interventions after first primary surgery for the main cause (29 posterior fossa decompression, 11 tumor resection and 2 cervical laminectomy), 9 patients were underwent cyctectomy using T-tube, 6 patients were underwent syringopleural shunt and cystectomy±myelotomy applied in 4 patients. Shunt and T-tubes 9-year revision rate was %59.3.

CONCLUSION: Treat the main cause of syringomyelia such as resection the tumor or decompression, the cavity of syringomyelia may disappear automatically. Syringomyelia caused as result of ependymomas or spondylosis was regressed after tumor removal and cervical decompression. A broader understanding of the pathophysiology of syrinx formation and progression is necessary and such research is currently underway. T-tubes and syringopleural shunt have high revision rate. The clinical recovery in syringomyleia patients is not possible every time.

Keywords: Syringomyelia, chiari syndrome, spinal intarmedullary tumors, meylotomy, T-tube, Syringopleural shunt

Poster Bildiriler

PP-059

PRIMARY SPINAL EWING'S SARCOMA/PNET: SURGICAL TREATMENT OF NINE PATIENTS

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OBJECTIVE and BACKGROUND: Primary Ewing's Sarkoma (ES) is the most common malignant primary bone tumor of the spine in children which accounts for 5% of all spine bone sites. The peak incidence of ES occurs between 10 and 20 years of age, and more than 80% of cases occur before the age of 20. The current study evaluates the surgical treatment outcome of eight patients with primary spinal ES who undergone surgery at neurosurgery departments in BRSHH and BVU institutions.

METHODS: Medical records between 2008 to 2017 in both institutions were retrospectively reviewed. The patients who were underwent surgery for spinal lesions and diagnosed as primary Ewing's Sarcoma/PNE were included in this study. Laminectomy performed using high speed drills under microscope to reach the lesion and in all patients. The long-term clinical outcomes were evaluated retrospectively using patients complaints, the periods of first compliant and surgery, recurrence rate and complications.

RESULTS: Nine cases of spinal ES/PNET were detected in 2 women "22.2%" and 7 men "77.8%" patients. The mean follow-up period (survival rate) was 38.7±32.2 (3-105) months. The mean age of the patients was 26.7±6.9 (15-42) years. Six cases were extradural and 3 were intradural-extramedullary. Five tumors were located in lumbar spine, two were located in sacral and two else in lumbosacral spine. The most common complaints were back pain (77.8%), motor deficit (66.7%), loss of sensation (50%), and urine incontinence (33.3%), respectively. Seven patients underwent gross-total resection and two patients underwent subtotal resection. The mean period from first complaint till referring to our hospital was 2 months (1 day - 8 months). Except for three patients (lumbar, sacral and lumbosacral; 105, 62 and 26 months, respectively) all patients were died; two of the dead patients were experience cranial and lung metastasis. The first-year local recurrence rate was 22.2%. Morbidity rate was 33.3% (new motor deficit occurred postoperatively). Mortality rate was 66.7% for spinal tumors.

CONCLUSION: The survival rate of patients with ES/PNET increased after treating with a combination of all of chemotherapy, radiation therapy after removal lesion totally (P<0.0001). Negative prognostic factors included large size, and metastasis.

Keywords: Ewing's Sarcoma/PNET, malignant primary bone tumor, intradural extramedullary, extradural, intracranial, gross-total resection

Poster Bildiriler

PP-060

THE COMPARISON OF THREE DIFFERENT SURGICAL TREATMENT METHODS USED IN LUMBAR SPINAL STENOSIS

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INTRODUCTION: Many different methods have been defined in the surgical treatment of lumbar spinal stenosis. Different treatment methods lead to different clinical outcomes. The data of 51 patients who underwent three different surgical procedures for lumbar spinal stenosis were analyzed retrospectively. The aim of this study was to compare clinical results of different surgical methods in cases with lumbar spinal stenosis

MATERIALS and METHODS: Patients with neurogenic claudication, with decreased lumbar spinal canal diameter and no sign of instability in preop imaging were included in the study. The data of 51 patients who were operated in three different methods in two different clinics were examined. Patients were categorized into three groups according to the surgical method used: Group 1; bilateral decompression via unilateral approach (18 patients),Group 2; bilateral decompression via unilateral approach and unilateral instrumented fusion (16 patients), andGroup 3; Total laminectomy and bilateral instrumented fusion(17 patients).Demographic data, mean operation time, mean bloodloss, mean hospitalization time, preoperative and postoperative VAS were reviewed. The patients were followed for an average of 13 months.

RESULTS: Fifty one patients were included in the study.There were 31 female patients and 20 male patients.The meanage for the groups was; 63.3, 65.7, 55.8, mean duration of surgery 94.7, 105.1, 163.8 minutes, mean blood loss as cc; 70.4, 75.2, 275, mean duration of hospital stay was 2.1, 3.1 and 3.6 days. Pre-operative and post-operative lumbar VAS value decreased from 8.3 to 2, from 8.5 to 2, and from 8.1 to 3, in group 1, 2, and 3, respectively. Pre-operative and post-operative leg VAS value decreased from 7.1to 3, from 8.3 to 3, and from 8.6 to 2, in group 1, 2, and 3, respectively.

Incidental durotomy was themost common complication, and was seen 5 patients in Group 1 (27.7%), 2 patients in Group 2 (12.5%) and 2 patients in Group 3 (11.7%).

One patient in group 1 and 1 patient in group 2 underwen tre-discectomy, and one patient in group 3 underwent surgery for adjacent segment disease. There were no infection group 1, and superficial surgical site infection in one case in group 2, and in one case in group 3.

CONCLUSION: This study revealed comparable clinical results among cases who underwent surgery using different methods. However, as the aggressiveness of the surgical method increases, some parameters such as duration of surgery, amount of blood loss, and duration of hospital stay may be affected negatively.

Keywords: lumbar spinal stenosis, different surgical methods, comparison

Poster Bildiriler

PP-061

EVALUATION OF THE EFFICIENCY OF SERIAL CASTING IN EARLY TREATMENT OF CONGENITAL SCOLIOSIS

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In early-onset idiopathic scoliosis, serial casting is an effective treatment modality. However, the role of this method in congenital scoliosis has not been well studied. In early-onset scoliosis, anatomical structures may be injured and spontaneous fusion may develop during surgical procedures even in growth-friendly methods. As a consequence of skin subcutaneous and fat tissue development is not completed in this age group, wound site problems can be encountered frequently after surgical procedures. Casting under anesthesia is a safe method that favors lengthening by keeping the curvature progression under control. The patients who were diagnosed as congenital scoliosis between 2015-2018 and who had not undergone any surgical treatment with a Cobb angle over 25 degrees and between 2-5 years with congenital vertebral developmental defect were included in this study. The patients who underwent cast renewal in every 3-month interval were evaluated with their standing whole-spine frontal radiographs for congenital and compensatory curvatures, sagittal deformities, T1-T12 height, number of casts, subsequent surgical interventions and their complications. In progressive congenital scoliosis, serial cast applications under anesthesia delay surgical interventions. Since no surgical intervention has been applied, negative effects of surgical interventions on growth were omitted by time-buying treatment without restraining lengthening.

Keywords: congenital scoliosis, serial casting, derotational cast correction

Poster Bildiriler

PP-062

LEG LENGTH DISCREPANCY AND SCOLIOSIS: CLINICAL AND RADIOLOGICAL CHARACTERISTICS

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INTRODUCTION: Leg length discrepancy (LLD) is common in population but several questions have remained largely unanswered. Particularly how leg length difference relates to clinical sign and which method is preferable to evaluate and what are the incidental and compensatory relationships of LLD to pattern of scoliosis and angular torsional deformities of pelvis and lower extremities remain controversial.

OBJECTIVES: The main of objective of this study to determine the measurement methods of LLD and to investigate in correlation of scoliosis pattern in relation to Cobb degree with anisomelia and magnitude

MATERIAL-METHODS: 19 patients, with structural LLD were assessed for this prospective study. Demographic characteristics and clinical data of patients were collected. One of the investigators evaluated LLD by measuring standard tape measure and is referred direct clinical measuring method. Wooden blocks of known height and scoliometer measuring were used to evaluate the amount of LLD as other evaluation methods and are referred as indirect method. Scoliosis pattern, Cobb angle, axial rotation of vertebra, pelvic obliquity and internal pelvic obliquity were measured from AP spine X-Rays by an orthopaedic surgeon who did not participate in clinical evaluation. Frequency, descriptive and Spearman correlation statistical analysis were performed with SPSS 20.

RESULTS: Nineteen patients, 12 females and 7 males were included in this study. Left limb was shorter in 14 and right in 5 patients. The LLD ranged from 0,5 to 7 cm. According to scoliotic curve pattern there were; 11 left lumbar, 4 right lumbar, 2 left thoraco-lumbar and 2 left thoraco-lumbar. Demographic data of patients are given on Table 1. Cobb angle varied in proportion to the severity of anisomelia. Scoliotic convex curve was on the shorter limb. The correlation between LLD and scoliosis degree, axial rotation and pelvic obliquity was statistically significant. (Figure 1)

CONCLUSION: There was a good correlation between scoliometer and other direct and indirect measurement methods that used in study. The method of scoliometer measuring can be a new indirect method to measure LLD. This method should be investigated with wider sample population. There was a close relationship Cobb degree, axial rotation, pelvic obliquity between LLD. LLD is really great enough to cause a pelvic tilt and a scoliotic convex curve of lumbar spine on the side of the shorter leg. Our results are similar to previously published radiographic measurements in subjects with structural LLD.

Keywords: scoliosis, leg length discrepancy, anisomelia

Poster Bildiriler

Correlations Between Clinical and Radiological Outcome

Correlations between Clinical and Radiological Outcome

Correlations	r	p
Max. Cobb angle- Pelvic obliquity	0,526*	**0,021**
LLD- Max. Cobb angle	0,362	0,128
LLD- Lomber Cobb angle	0,834**	**0,000**
LLD- Pelvic obliquity	0,671**	**0,002**
LLD- Axial rotation (Pedriolle)	0,484*	**0,036**
LLD- Sacral angle on scoliometer	0,546*	**0,019**
Pelvic obliquity - Sacral angle on scoliometer	0,527*	**0,025**
LLD (% Height) - Pelvic obliquity	0,643**	**0,003**

**p<0.05 strong relationship at significant level
**p<0.01 very strong relationship at significant level

Table 1: Demographic and Clinical Characteristics of Patients

Variables	Mean±SD	Min-Max
Age (year)	15,2±6,1	8,0-33,0
Height (cm)	157,4±16,1	133-187,5
Max. Cobb angle˚	20,8±8,7	9,0-38,0
Axial rotation˚ (Pedriolle)	5,2±6,7	0,0-20,0
Pelvic obliquity ˚	7,1±3,1	3,0-15,0
LLD (cm)	1,7±1,4	0,5-7,0
LLD (% of Height)	1,0±0,8	0,3-3,9
Sacral angle on scoliometer ˚	5,5±4,1	-2,0-13
Sacral angle on scoliometer with wooden block˚	0,6±1,5	0,0-5,0

Poster Bildiriler

PP-063

LATE-TERM SPONDILODISCITIS IN A PATIENT WITH OPERATED ANKYLOSING SPONDYLITIS: A CASE REPORT

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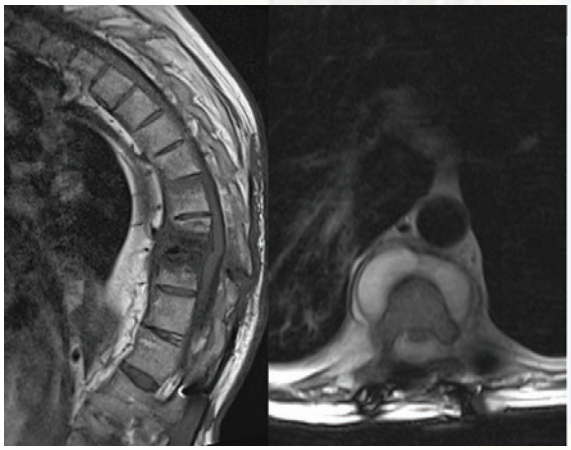
INTRODUCTION AND AIM: Ankylosing spondylitis is a slow-course chronic inflammatory joint disease that begins before the age of 30 and involves the spinal column and sacroiliac joints. The disease develops in 3 stages: inflammation, bone erosion, and spur formation. In the late stage, the granulation tissue is replaced by fibrous tissue, which is then ossificated and destroys the joint completely. The fusion that develops in facet joints and intervertebral discs leads to the typical radiographic bamboo cane spine. Our aim in this case report was to show that purulent spondylodiscitis may rarely develop in cases with ankylosing spondylitis which resulted in global kyphotic deformity and complete fusion.

RESULTS: A 45-year-old male patient underwent smith-peterson osteotomy at L3-4 and corrective T9-L5 posterior instrumentation 16 years ago due to severe kyphosis. The patient did not have any active complaints for 11 years, and then purulent discharge began in the lower thoracic region. Medical treatment was performed in the infections disease service, but the complaints did not regress. In this patient, MRI was reported as discitis, the patient was admitted to the infectious disease clinic where teicoplanin treatment was initiated. Discharge continued intermittently for four years, and another MRI was performed after discharge increased and patient did not respond to antibiotherapy. MRI revealed abscess foci and spondylodiscitis related to the corpus anteromedial and anterolateral invertebral disc. Bilateral costotransversectomy was performed at T10-11 and abscesses in the corpus anteromedial and anterolateral were drained. Gram-positive cocci in clusters were found in gram staining and staphylococcus aureus were found in culture. As the purulent discharge of the patient continued, posterior instrumentation was removed 4 months later, and the abscess was re-drained. Antibiotherapy continued. There was no discharge in the postoperative 2-month period. The patient had weakness in the lower extremity and outpatient clinic follow-up revealed that patient was not able to walk without support. MRI imaging revealed severe cord edema due to instability, and posterior instrumentation was performed on the patient again. Postoperative physical examination revealed normal muscle strength and no infective findings.

CONCLUSION: In patients with ankylosing spondylitis, discitis is not an expected complication due to the nature of the disease, but it can be rarely seen. It should be kept in mind that spondylodiscitis and related paravertebral abscess may develop in the late period in patients with ankylosing spondylitis who underwent posterior instrumentation.

Keywords: Ankylosing Spondylitis, Spondylodiscitis, Paravertebral Abscess



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Poster Bildiriler

PP-064

PROXIMAL JUNCTIONAL DISC DEGENERATION AT THE UPMOST SEGMENT OF PARASPINAL MUSCLE FATTY INFILTRATION IN SYMPTOMATIC GIRLS WITH LOW BACK PAIN: A NEW PERSPECTIVE FOR THE AETIOLOGY OF LOW BACK PAIN

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BACKGROUND: The prevalence of low back pain in adolescents ranges from 1.1% to 66%. Low back pain mostly recurs with greater intensity, impairs physical activities and increases school absenteeism in adolescents. Fatty infiltration in the paraspinal muscles is associated with poor physical performance, disability, and the increased risk of recurrent pain in patients with chronic low back pain. However, only a few studies evaluated paraspinal muscles in adolescents. We aimed to find out, whether lumbar intervertebral disc degeneration was associated with paraspinal muscle fatty infiltration in adolescents with low back pain.

METHODS: Intervertebral disc degeneration, vertebral end-plate changes, and fatty infiltration in the multifidus, erector spinae, and psoas muscles at all lumbar intervertebral disc levels were evaluated on lumbar spine magnetic resonance images of 69 symptomatic adolescents with low back pain.

RESULTS: Intervertebral disc degeneration was significantly more severe in girls at L3-L4 disc level (p= 0.036). Girls had significantly higher Goutallier scores for the multifidus at L4-L5 and L5-S1 disc levels and for the erector spinae at L3-L4, L4-L5 and L5-S1 disc levels than boys had (p= 0.001- 0.010). They also had significantly higher quartile scores for the multifidus at L3- L4, L4-L5 and L5-S1 disc levels, for the erector spinae at L3-L4 and L5-S1 disc levels when compared to boys (p = 0.002- 0.046).

CONCLUSIONS: Symptomatic adolescent girls have significantly more fatty infiltration in the multifidus and erector spinae at L3-L4, L4-L5 and L5- S1 disc levels, and more severe disc degeneration at L3-L4 disc level comparing with symptomatic boys. The disc degeneration and paraspinal muscle fatty infiltration patterns of symptomatic adolescents barely differ from those in symptomatic adults.

Keywords: paraspinal muscle, disc degeneration, multifidus, erector spinae, psoas, adolescents

Poster Bildiriler

PP-065

A NEW APPROACH FOR SPINAL DEFORMITY PATIENTS WITH MENINGOMYELOCELE: REVERSE Y INCISION

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PURPOSE: Meningomyelocele (MMC) is characterized by a defect in the vertebralcolumn and closed surgically after birth. Spinal deformity (scoliosis 94%, kyphosis 15%,hyperlordosis 2%) is a common problem in children with myelodysplasia, and affects pulmonary function and sitting balance. Skin probems and infections are most common consern prior to surgery. The aim of this study is to present a different surgical approach for spinal deformity in patients who had undergone meningomyelocele closure surgery.

MATERIALS AND METHODS: We reviewed 9 patients who had underwent spine deformity correction with a new incision. All of them had multiple old incisions due to closure of dural sac of meningomyelocele during the neonatal period. Defected area levels were determined with preoperative CT and MRI. These levels were again marked by fluoroscopy just before the operation. Under general anesthesia, patients were lied in prone position with pillows leaving the abdomen free. Incision from T2 to the region of the posterior vertebral defect, where the skin is thin and scarred, was made through a longitudinal incision over the spinous process and advanced to the last level with 2 legs (reverse Y incision) over the posterolateral parts of the vertebrae marked with fluoroscopy. Like Wiltse Approach between multifidus and longissimus muscle the facet joints and transverse processes exposed. Two pedicle screws were tried to be instrumented on each level. After correcting the deformity, it was observed that the screw heads and rods were covered by the muscles when the retractors in the muscle plans were removed. Muscle and fascia were closed using vicryl. Skin was closed with staples. Drains were removed on the 2nd day. Dressings were changed every 3 days. Staples were removed on the 15th day.

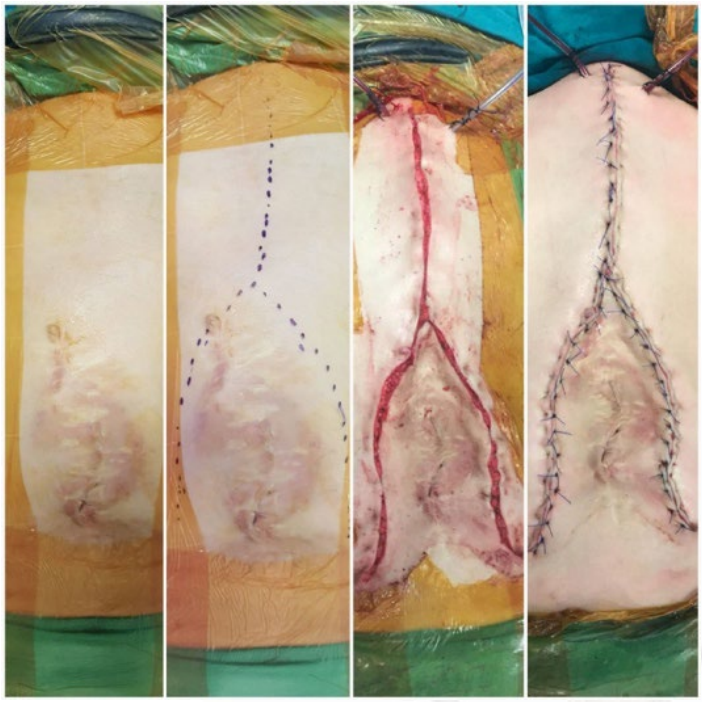
RESULTS: The 9 patients included 4 females and 5 males with an average age of 9 years had 6 scoliosis,1 hyperlordosis and 2 kyphosis. Minimum follow-up for our patients was 12 months. The average blood loss was 600 ml. The preoperative coronal deformity improved from 100° to 20°. The preoperative kyphosis improved from 110° to -10°. The lordotic curve improved from 120° to 50°. There was no decrease in perop potentials in 7 patients used neuromonitorization. We havent seen any dural injury. Superficial skin necrosis was observed in 2 patients and improved without debridement. Postoperative infection was not observed in any of our patients.

CONCLUSIONS: The reverese Y incision is a usefull technique for MMC related spinal deformities with skin problems.

Keywords: meningomyelocele, spinal deformity, skin problems

Poster Bildiriler

reverse Y incision



multiple incision scars due to prior surgey

Poster Bildiriler

PP-066

SINGLE SURGEON STUDY OF THE OUTCOMES OF THE SURGICAL TREATMENT OF AIS USING THE SRS22, TRUNK MOBILITY AND STRENGTH; MINUMUM 5 YRS FOLLOW UP

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STUDY DESIGN: Single surgeon study of the outcomes of the surgical treatment of adolescent idiopathic scoliosis (AIS) using SRS22 and analysis of differences among healthy individuals and those with operated.

OBJECTIVE: To evaluate the patient based outcome of the surgical treatment of adolescent idiopathic scoliosis.

SUMMARY OF BACKGROUND DATA: A paucity of information exists with respect to patient measures of outcome regarding the surgical treatment of adolescent idiopathic scoliosis with long term follow-up.

METHODS: This study included 30 patients surgically treated for adolescent idiopathic scoliosis (AIS) between 2004 and 2012. The Scoliosis Research Society Patient Questionnaire (SRS-22) were used for evaluating long-term clinical outcomes. There were 28 females (93%), 2 males; with mean age, 15yrs. At the time of surgery [range 12–18]). The mean follow-up period was 7 (range 5-14) years. To determine the mobility and strength David Health solution devices were used (G110 DMS-EVE, G120 DMS-EVE,G130-DMS-EVE). 26 healthy age and sex-matched individuals with neither a history of spinal surgery nor scoliosis were selected as a control (CTR) group. Data were collected at the final follow-up visit.

RESULTS: SRS22r results were Function 3.37, Pain 3.75, Self Image 3.76, Mental Health 2.90, Satisfaction/ Dissatisfaction 4.47.Mobility of scoliosis patients were within normal values,no difference were noted between left/right.Rotational values of control group were better than scoliosis patients. All in all scoliosis patients has weaker strength levels than in control groups, greatest difference is in lateral flexion results. Strength balance **RESULTS:** with in the whole group scoliosis patients, rotation right is slightly weaker (-8%) compared to rotation left.

CONCLUSION: In long term results of operated AIS patient were acceptable with the SRS22 satisfaction rate of 4.47. In spite of fusion of more than half of thoracolumbar vertebrae in terms of mobility rotational values less than control group but within the referans values. But strength is weaker in scoliosis group than the control group.

Keywords: scoliosis, SRS22

Poster Bildiriler

PP-067

LONG TERM FOLLOW-UP OF OUR TECHNIQUE FOR GROWING ROD

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INTRODUCTION: The spine is a key factor in the growth of thorax, abdomen, and pelvis. By the age of 5 years, the spine reaches 50% of its adult length. Therefore, spinal fusion in a 5-year-old child can result in about 12.5 cm loss of spinal growth. Treatment of EOS is one of the biggest challenge of spine surgeons. The ideal technique should maintain the correction of the deformity, allow continued spinal growth, should not require postoperative immobilization, and also should have low complication rates. There are several growing rod techniques which have been defined but none of them fulfill all of these conditions. The aim of this article is to present long term follow-up of this growing rod technique.

PATIENTS and METHODS: Ten children have been operated by the single surgeon, at an average age of 8 (range, 4–9) years. The surgical technique involved short segment instrumentation applied on the convex side of the apex of the deformity. Pedicle screws or hooks were used at stable anchor levels of the concave side of the deformity. Two rods, one proximal and one distal, were fixed to anchor sites and connected by a domino connector. After distracting the concave side, a transverse connector was used between the short segment and the long one, and this connector was compressed to maintain a translational force on the apex of the deformity. The frequency of lengthening procedure is 6 to 9 months.

RESULTS: The average follow-up was 5 yrs.. The average preoperative coronal plane curve was 46 degree and corrected to 13 degree showing 74% scoliosis correction after index surgery. Six of the patients had final surgery and needed to have apical smith-peterson osteotomies for final correction.

CONCLUSION: We found that this technique is able to control the cobb angle but not able to control the rotation. For this reason we decided to use hump measurements combined with cobb angle for the follow-up. We also modified our technique to use apical 3 level concave screws to control the rotation for new patients.

Anahtar Kelimeler: EOS,growing rod, long term followup

Poster Bildiriler

PP-068

THE EFFECTS OF ISOKINETIC MUSCLE EXERCISE THERAPY ON NECK, BACK, LOW BACK PAIN AND KYPHOSIS

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INTRODUCTION: Pain in the neck, back and waist and postural kyphosis are the most common problems in population. In these cases, conservative treatment always must be the first choice. In our prospective study, we presented the effects of regular isokinetic muscle exercise programmes on treatment.

MATERIAL AND METHOD: In this study, 15 neck, back and waist pain (group 1) and 13 kyphosis (group 2) patients were evaluated. The age average and the gender of the cases were 27, age, W/M=13/2 in group 1 and 47 age, W/M=10/3 in group 2 respectively. The Roland morris disability indexes, the two-way spine graphies and isokinetic muscle measurments of the cases were obtained before and after the study. The cases were exercised 2 times a week for 3 months with David Health Solution G 110 DMS-EVE Lumbar thorasic extension, G 120 DMS-EVE lumbar thorasic rotation and G 140 DMS-EVE cervical extension lateral flexion devices.

RESULTS: In group 1, 9.1-100% improvement was obtained in RDMQ. The average improvement is 74.6%. When the programme was completed, the neck, back and waist isokinetic muscle strength were improved 99.2%. In group 2,121.55% in muscle strength was obtained while thorasic cobb angles improved 42%.

CONCLUSION: Muscle strengthening with David Health İsokinetic muscle exercise programme, made evident difference in terms of RMDQ and radiological improvement in both groups and determined as a method of conservative therapy in treatment of these patient groups.

Anahtar Kelimeler: Pain, Deformity, isokinetic muscle exersice

Poster Bildiriler

PP-069

MULTILEVEL SPINAL EPIDURAL HEMATOMA CAUSING CAUDA EQUINA SYNDROME DUE TO S1-S2 FRACTURE-DISLOCATION: CASE REPORT

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INTRODUCTION: Sacrum fractures are one of the fractures which are neglected and untreated. The presence of retroperitoneal hemorrhage as a result of sacrum fracture is a life-threatening condition and it has priority over the sacrum fracture, but if sacrum fractures are detected at the first evaluation and treatment is planned, it is possible to provide pelvic stability and so that neurologic deficit not develop and / or improve. Maintain pelvic stability is necessary to control intra-pelvic and retroperitoneal bleeding.

METHOD:

Case report

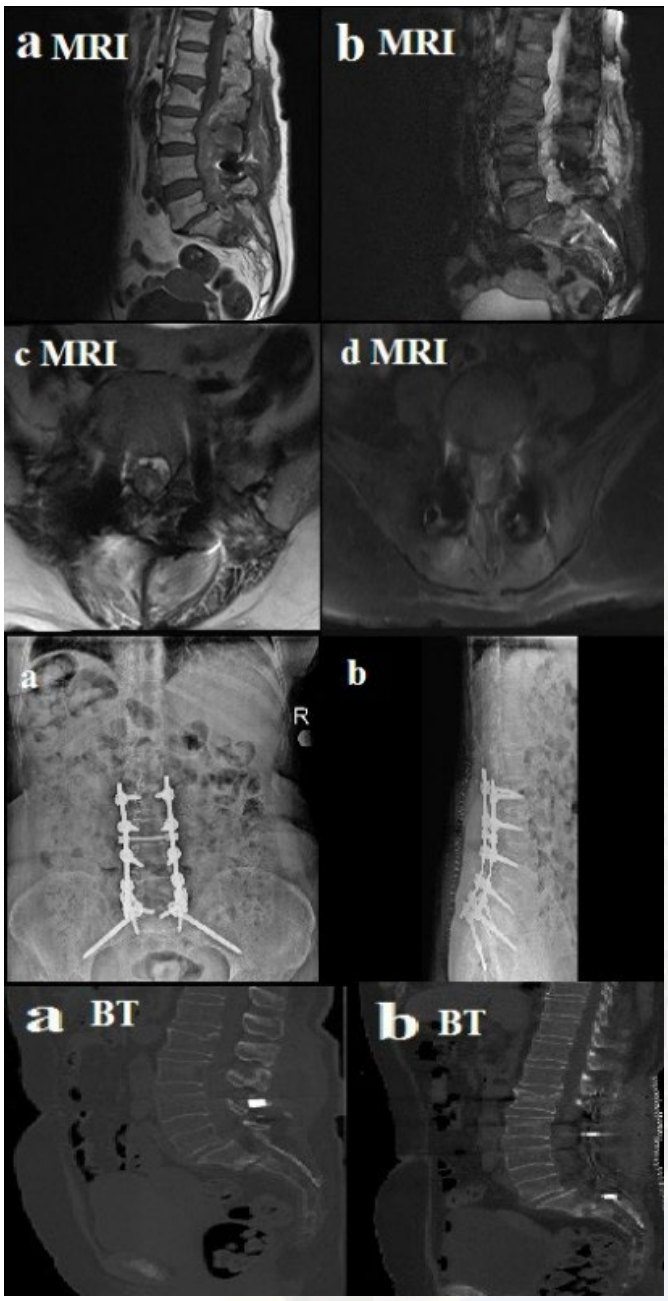
CASE: A 74-year-old female patient, 2 months ago, underwent L3-S1 stabilization due to lower back and lower back pain in a hospital. Two days before admission to emergency room of our hospital, she had progressively developed numbness in her legs and urinary and fecal incontinence. She was admitted to the emergency service of our hospital because her complaints had worsened and she could not walk. The patient's neurological examination revealed bilateral paraparesis which weakness of legs especially below the knees (proximal 3/5, distal 1/5), hypoesthesia, urinary and fecal incontinence. S1-S2 fracture and dislocation and epidural hematoma between L3- S2 were detected in the emergency computerized tomography (CT) and magnetic resonance imaging (MRI), then the patient was taken to emergency operation. In the operation, stabilization with bilateral L2-S1 transpedincular and bilateral sacro-alar-iliac screw was achieved, followed by an acute epidural hematoma evacuated by L3-L4-L5-S1 total laminectomy. The patient showed a slow recovery after the emergency operation, her neurological examination revealed paraparesis which weakness of legs especially below the knees (proximal +3/5, distal 2/5), but urinary and fecal incontinence were unchanged. She was discharged on the 10th day with the recommendations of physical therapy.

RESULT: In the classification of sacrum fractures, the fractures related to central sacral canals are the 3rd region fractures. They are seen in two types as sacral burst fractures (posterior lamina is intact) and fracture-dislocation (horizontal lamina fracture). If there is no neurologic deficits, treatment consist of pelvic

Keywords: Epidural, Hematoma, Sacral, Lomber, Fracture

MRI, X-RAY, TOMOGRAPHY

Poster Bildiriler



Pre-op MRI showed S1-S2 fracture-dislocation and L3-S2 epidural hematoma (a,b,c,d MRI). Post-op X-ray showed L2-sacro -alar-iliac screw stabilization (a,b) Post-op CT showed L3-S1 total laminectomy (a,b BT)

Poster Bildiriler

PP-070

THE COMPARISON OF PARAVERTEBRAL UBE AND FORAMINAL PELD AT LUMBAR FORAMINAL AND EXTRAFORAMINAL DISC PATHOLOGIES

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AIM: In that study, we aimed to compare monoportal and biportal endoscopic methods that are already performing in our clinic during treatment of foraminal pathologies.

MATERIAL-METHOD: Between May 2018 and December 2018, randomly selected 23 patient who had foraminal and extraforaminal disc pathologies were selected and underwent to foraminal PELD and paravertebral UBE The patients were selected according to admission to Hospital. The first application was initially done with heads and tails method So that the first case was underwent to surgery according to PELD method. Then UBE and PELD were performed. 12 patient was underwent to surgery with PELD method while 11 patient was underwent to UBE method.

RESULTS: According to preop ODI and VAS scoring, number of success and very succesfull patients operated with UBE method was 100%. Regarding cases that were operated with transforaminal mono portal endoscopic method, 5 cases was very excellent, 3 cases was successful and 3 cases was bad that undergone to revision surgery.

CONCLUSION: UBE is more effective method comparing to monoportal approaches due to bi-portal approach and providing to see exiting nerve root and entire foramen directly.

Keywords: Foraminal stenosis, foraminal disc, extraforaminal disc, endoscopic foraminal disc surgery, paravertebral UBE

Poster Bildiriler

PP-071

MID- TERM RESULTS OF TRI-SEGMENTER POSTERIOR INSTRUMENTATION FOR THE TREATMENT OF UNSTABLE THORACOLUMBAR FRACTURES

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AIM: This study aimed to review the mid-term clinical and radiological outcomes of the patients with thoracolumbar unstable burst fractures treated by 4-level instrumentation.

MATERIAL-METHODS: 42 patients (27 males and 15 females) who were operated for unstable thoracolumbar fracture in Okmeydanı Training and Research Hospital Orthopedics Clinic between 2013-2015 were evaluated retrospectively. Inclusion criteria; the presence of acute, single level, traumatic and unstable thoracolumbar fracture, surgical treatment with three-segmental fixation and at least two years follow-up were determined. Patients with osteoporotic or pathological fractures, multiple fractures, and insufficient clinical and radiological documentation were excluded from the study. When the fracture levels were examined, three patients were treated with T11, 21 patients with T12, and 18 patients with L1 vertebra fracture. The classification of the fractures was done according to AO Magerl classification; 33 patients had A3 and A4 fractures. All of the patients underwent four levels posterior instrumentation and fusion and mobilized on the second postoperative day. Clinical outcomes of the patients were assessed according to the Oswestry Disability Index and Visual Analog Score. For radiologic evaluation, segmental Cobb angle, anterior body height loss and loss of correction were measured by plain radiographs. The patients were evaluated radiologically and clinically at six weeks, three months, six months, 1 and two years after surgery. The results were compared with dependent and independent t-test, Mann-Whitney U test and Chi-Square test.

RESULTS: The mean age was 36.7 ± 10.72 and the mean follow-up period was 25.6 ± 1.57 months. Similarly to VAS scores, ODI results showed a statistically significant decrease at six months; however, there was no significant difference between 1st and 2nd-year results. The segmental Cobb angle was 20.65 preoperatively, 5.55 after surgery and 7.86 at the final follow-up. Anterior height loss was found to be 40 preoperatively, 15.22 postoperatively and 18.32 at the last follow-up. Compared to preoperative values, segmental Cobb angle and anterior height loss were significantly improved at the final follow-up ($p < 0.001$). The postoperative correction loss was 10.56% and 11.7% after one year and two years, respectively. None of the patients had a neurological deficit, deep infection, thromboembolic events, and pseudoarthrosis.

CONCLUSION: Successful results were obtained clinically and radiologically with three-segmental fusion (fracture level with one lower and two upper levels) in the surgical treatment of thoracolumbar unstable burst fractures. Although a radiological loss of correction was detected, there was no effect on clinical results.

Keywords: three-segmenter fusion, four level instrumentation, Oswestry Disability Index, VAS

Poster Bildiriler

PP-072

A CASE OF GLOMANGIOMA LOCATED IN THE THORACIC VERTEBRA

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INTRODUCTION: Glomus tumors are benign tumors originating from the neuromeserial glomus body. The glomus body is present in the stratum reticularis layer of the dermis and helps to regulate blood pressure and temperature. It is often seen on hand fingertips. Glomus tumor gives classic triad; pain, point sensitivity and cold sensitivity. Intraosseous glomus tumor is very rare. 5% are malignant and are characterized by a metastatic mass. Although glomus tumor located in the thoracic and lumbar region is more rare, 7 cases could be found in the literature review. Primary vertebrae glomangioma is seen as an osteolytic lesion in Computerized Tomography (CT). Magnetic Rezonance Imaging (MRI) shows iso or hypointense in the T1 sequence, and hyperintense in the T2 sequence. We want to contribute the literatüre reporting this case.

METHOS:

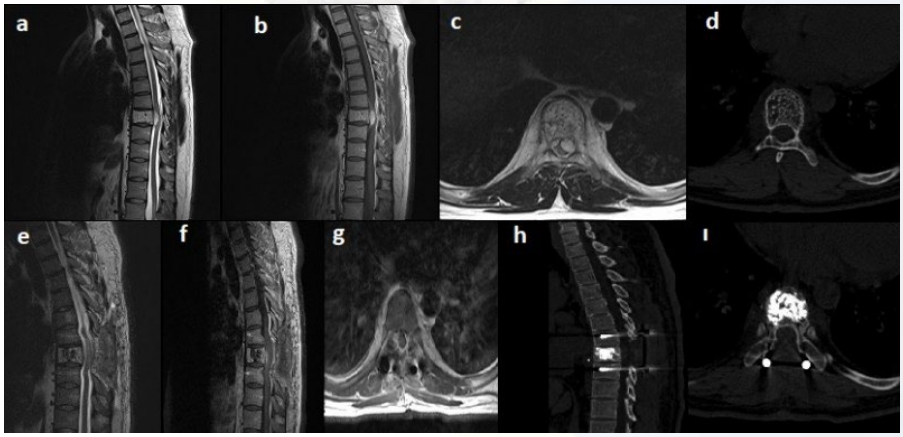
CASE REPORT

CASE: A 38-year-old male patient was admitted to our hospital with complaints of numbness and difficulty in walking started 1.5 months ago. There was no trait in the background. His neurological examination revealed paraparesia (4/5), babinsky positive bilaterally, hypoesthesia below T8 level. Contrast-enhancing MRI revealed a lesion extended to spinal canal in the corpus and pedicle of T8 vertebra. CT showed lytic lesion in the T8 vertebra. Operation was recommended to the patient. In the operation, T7-T8 total laminectomy, extradural mass excision, T8 vertebroplasty, and fixation with T7-T9 transpediculer screws were performed. Histopathologically reported as glomangioma.

RESULT: Glomus tumor is a benign tumor originating from the glomus body that controls blood flow at the fingertips. According to the Mayo Clinic data, it constitutes 1.6% of soft tissue tumors. Intraosseous spinal colon located glomangioma is seen rarely. Literature data is limited. It constitutes clinic due to mass effect. Osteolytic lesion formation in CT, and T1 sequence iso or hypointense, T2 hyperintense lesion formation in MRI is typical. Intraosseous cases have been reported in patients with epidural space spreading or intrathoracic invasion. In our case embolization was performed prior to surgical resection of the tumor,which had abundant blood supply.

Keywords: Glomangioma, Spine, Surgery, Toracic

MRI, TOMOGRAPHY



Pre-op MRI revealed the lesion extended epidural space in the corpus and pedincule of T8 vertebra, also paravertebral area involvement (a,b,c) Pre-op CT showed lytic lesion in the T8 vertebra. Post-op MRI revealed decompression, extradural mass excision at level of T7-T8 (e,f,g) Post-op CT revealed vertebroplasty at T8 level and stabilization with T7-T9 transpediculer screws (h,ı)

Poster Bildiriler

PP-073

SACRAL INSUFFICIENCY FRACTURE, A RARE COMPLICATION AFTER LUMBOSACRAL STABILIZATION. A CASE REPORT

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Sacral insufficiency fracture is typically seen in the elderly with or without simple trauma or in patients with osteoporotic bones; it may alternatively occur as a rare complication of stabilization. Its early diagnosis is difficult because lower lumbar degenerative vertebral diseases may frequently coexist. There is no history of major trauma, and routine direct films cannot adequately visualize this lesion. Its exact incidence is unknown. Several studies have reported that its incidence is between 1.3% and 4.3% after lumbosacral stabilization. Our patient was a 63-year-old woman who had been operated with L2,L3,L4 laminectomy for lumbar spinal stenosis for three times elsewhere. She presented to our clinic with bilateral leg pain, impaired posture, and difficulty walking. She was diagnosed with lumbar degenerative scoliosis and L3-L4 spondylolisthesis. We implanted bilateral Th10-S1 pedincular screws; performed ponte osteotomies; and carried out rotation and compression followed by stabilization of the deformity. The patient's leg pain was eliminated and low back pain was alleviated after surgery. Two months later she developed low back and bilateral hip pain, with the left side being more intense, which were intensified in upright position and upon palpation, and relieved while lying down. A sacral magnetic resonance imaging (MRI) examination revealed bilateral vertical fractures in the shape of a fissure involving the ala of the sacrum (Figure 1). A sacral computerized tomography (CT) showed a fissure line. The lesion was considered to be a sacral insufficiency fracture. The patient was prescribed bedrest and medical therapy. After a 1.5-month follow-up, she complained of progressively intensified pain and was thus recommended to undergo sacroplasty operation. Sacral insufficiency fracture should be considered in ostoporotic patients. Moreover, it should be remembered that postoperative sacral insufficiency fracture may occur in osteoporotic patients undergoing lumbosacral stabilization. Patients' symptoms and examination findings should be taken into account in the diagnostic process. Coronal sacrum CT and MRI are the main radiological studies for showing sacral insufficiency fractures. Additionally, bone scintigraphy may show such fractures whenever needed.

Keywords: Sacral insufficiency fracture, Lumbosacral Stabilization, low back pain

Poster Bildiriler

PP-074

INVESTIGATION OF COCCYX CT IN ASYMPTOMATIC PATIENS IN TURKISH SOCIETY

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PURPOSE: Normal coccyx structure varies from person to person and is the most extreme structure of vertebra. It also varies from society to society. The aim of this study is to present a tomographic review of the coccyx structure of Turkish society.

METHODS: Retrospective analysis of 30 adult CT scans evaluated the following: number of coccygeal segments; joint fusion; coccygeal spicules, subluxation, sacrococcygeal and intercoccygeal angles, lateral deviation of the coccyx tip.

RESULTS: Thirty patients were included in the study. The mean age of the patients was 44.9 years. Four of the patients were female and 26 were male. Types of coccyx; 13 (43.3%) type 1, 9 (30.0%) type 2, 5 (16.7%) type 3, 2 (6.7%) type 4 and (3.3%) type 5. Coccyx segment numbers were 2 segments 5 (16.7%), 3 segments 14 (46.7), 4 segments 10 (33.3%) and 5 segments 1 (3.3%). Fusion was observed in 23 (76.7%) patients while fusion was not present in 7 (23.3%). Bony spicule was present 27 (90%) and 3 (10.0%) were absent in patients. Subluxation was present 26 (86.7%) and absent 4 (13.3%) in patients. Lateralization was absent 24 (80.0%) and present 6 (20.0%) in patients. Sacrocoxigeal angle was 109.87 (range: 87-135) and intercoxigeal angle was 41.80 (range: 20-70).

CONCLUSIONS: The aim of this study was to investigate the morphology of coccyx by tomographic examination. In our study in asymptomatic patients, we observed most frequently type 1 and 3 segment coccyx. Contrary to the literature, fusion was not very common. Luxation and lateralization proportions were similar to other studies.

Keywords: coccyx, tomographic, morphology

Poster Bildiriler

PP-075

A COMPARISON OF THREE DIFFERENT CEMENTING TECHNIQUES FOR APPLICATION OF PEDICLE SCREWS TO CALF SPINE: A BIOMECHANICAL STUDY OF 24 SEGMENTS

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AIM: In order to conduct a stable fixation to osteoporotic spine,bone cement augmentation is advised to be added to pedicle screw placement to increase the pull-out resistance of pedicle screws. In this experimental study comprising the calf spine,pull-out strenght of fenestrated pedicle screws(PS) placed with two different techniques on each segment with three different cementing techniques were evaluated with the aim to find out which technique provided superior pull-out resistance.

METHOD: In this biomechanical study,8 fresh calf vertebrae of the same spinal levels were placed in each of the three groups.With assistance of image intensifier 6.5mm pedicle screws were placed parallel to upper end-plates on the left side and with a caudal angle of 30° on the right side.Before the placement of the pedicle screws,trajectories were tapped with 6.5mm tapping device.3cc of middle viscosity bone cement (PMMA) was injected in group 1 after the placement of pedicle screws through both screws,while it was injected into the vertebral body directly before the placement of pedicle screws in group 2. In group 3 the bone cement was placed into the entire trajectory after tapping, before the placement of pedicle screws.After instrumentation and cementing an increasing axial force was applied to each pedicle screw (Autograph Universal Axial Loading Test Device).Maximum forces until the pull-out were measured and compared.

RESULTS: The mean pull-out strength(MPOS) on the right side was 1707.45N in group 1, 1766.97N in group 2, 4517.96N in group 3;while the MPOS on the left side was 1843.3N in group 1, 1869.3N in group 2, 5365.1N in group 3.As a result of the comparison of the pull-out resistance of three cementing techniques, no statistically significant difference was noted regarding group 1 and 2($p=0.981/964$),while group 3 was detected to have superior pull-out resistances with high statistical significance ($p<0.001$).Pull-out strengths of the two techniques of pedicle screw placement(right and left side) were compared in each group,while no statistically significant different was found pedicle screws placed with PS placed parallel to endplates were detected to have superior pull-out resistance values.

CONCLUSION: This study concluded that the cementing of the screw trajectory and vertebral body, before the placement PS was biomechanically superior to other cementing techniques resulting in the highest pull-out resistance values yielding to be a prototype for the ideal instrumentation of the osteoporotic spine.In addition to that, no statistical significance was found with regard to parallel or with 30° caudal angulation of PS to endplates.

Keywords: pedicle screw, pull-out strength, cementing techniques, osteoporotic spine, biomechanical study

Poster Bildiriler

Biomechanical Pull-out Test

Biomechanical Pull-out Test

Poster Bildiriler

PP-076

UNILATERAL APPROACH IN PERCUTANEOUS KYPHOPLASTY

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Percutaneous kyphoplasty (PK) is a surgical method who has been applied for the treatment of the osteoporotic compression fractures. Although this surgery traditionally defined as bilateral approach, there are some studies about the unilateral approach. The aim of our study is to compare the results of the unilateral and bilateral approach in terms of the complications and the operation time.

MATERIALS AND METHOD: This retrospective study included 82 patients (27 women and 55 men) who underwent percutaneous kyphoplasty (PK) between 2013 and 2019. The mean age was 74.2 years (range, 61-86). Of the 82 patients 11 patients had multiple vertebral fractures. PK was performed on 95 vertebrae. in 67 vertebrae unilateral kyphoplasty (UK), in 28 vertebrae bilateral kyphoplasty (BK) were preferred.

RESULTS: All procedures were made under local anesthesia and from the same side. We couldn't find any significance differences between the UK and BK methods in terms of complication rate and improvements in vertebral heights and kyphosis angle. The mean operative times were found as a 45,2 min for UK and 87,3 min for BK.

CONCLUSION: Our study reveals that; the UK is superior to BK in term of the operative time, also In addition, there are no any statistical differences in terms of the improvements in vertebral heights and kyphosis angle. The short operation time may play role in decreasing the complication rates.

Keywords: Unilateral kyphoplasty, bilateral kyphoplasty, percutaneous kyphoplasty, operation time, compare.

Poster Bildiriler

PP-077

A RARE CONGENITAL C2 FUSION DEFECT MIMICKING THE ODONTOID TYPE-1 FRACTURE OS ODONTOIDEUM: A CASE REPORT

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OBJECTIVE: Os odontoideum, a congenital anomaly of the odontoid process. Os odontoideum is a piece of round odontoid bone and located just above the bone. In this article, we aimed to present a case of os odontoideum incidentally detected after trauma in cervical CT.

MATERIAL-METHOD: A 25-year-old female patient was admitted to outpatient clinic because of neck pain. The patient stated that she had neck pain which continued for 2 days after falling on his back. In the examination, neck motion was free and painless in all directions and there was no motor sensory reflex deficits in upper extremity. There was no pathological reflex.

RESULTS: The cervical CT of the patient was evaluated. There was sclerotic line between os odontoideum and odontoid bone and both bone structures were found to be calcified. Analgesic treatment was given to the patient and the patient was called for control after 3 weeks.

CONCLUSION: Os odontoideum is the most common anomaly of odontoid outgrowth. It can rarely cause atlantoaxial instability and myelopathy. Os odontoideum can mimic odontoid type 1 fractures. The patient's investigations should be evaluated carefully and correctly. Accurate identification of the existing anomaly is important in order to prevent possible treatment errors.

Keywords: Os odontoideum, Congenital Anomaly, Cervical CT

Poster Bildiriler

PP-078

SURGICAL MANAGEMENT OF SPINAL CHORDOMAS AND CHONDROSARCOMAS: A SERIAL OF TWELVE PATIENTS

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BACKGROUND and OBJECTIVE: Chordomas and chondrosarcomas are midline tumors. They have a male preponderance. Sacrococcygeal region is the most common affected region. Chordomas and chondrosarcomas are rare, slow-growing but locally aggressive primary bone tumors arising from residual rests of notochord cells along the craniospinal axis. The current study presents the surgical management of patients with chondroma and chondrosarcoma involving spine.

METHODS: The patients operated between the years 2010 and 2017, for chordoma and chondrosarcoma at neurosurgery department in BRSHH institution. After laminectomy performed using high speed drills under microscope to reach the lesion. Clinical outcomes were evaluated retrospectively using patients age, sex, symptoms, the periods of first compliant and surgery, recurrence rate and complications.

RESULTS: Seven (one woman and six men) patients were confirmed histopathologically to be chordoma. The mean age of the patients was 48.6±21.1(17-78) years. The most common symptom was back pain (100%). The mean prodrome was 2.3±1.4(1-3) months. The mean follow-up period (survival rate) was 88.3±73.1(15-216) months. Except for one old patient, all patients were treated with combined anterior and posterior approach to achieve gross-total resection. Morbidity rate of surgical intervention was 22.2%. The first-year recurrence rate was 22.2%. Four (two women and two men) patients were confirmed histopathologically to be chondrosarcoma. The mean age of the patients was 53.7±20.6 (17-69) years. The most common symptoms were radicular pain, motor deficit, and loss of sensation (100%). The mean prodrome was less than 6 months 4.7±1.8(1-6) months. Locations were cervical (2), thoracic (1) and lumbosacral (1). For abundant bleeding, three patients (66-M;69-F; and 40-M) were resected subtotally. Local recurrence was detected in all three patients (after 12, 18 and 49 months, respectively). At recurrence all patients were resected gross-total resection except of one patient. Fourth patient was 17-years old female who underwent gross-total resection. She was followed-up for 76 months without recurrence. All patients were treated with combined anterior and posterior approaches. The mean follow-up period (survival rate) was 89.6±77.1 (13-218) months. The recurrence rate was 75.0%.. Only one chordroma patient was received beam proton therapy and all chondrosarcoma patients were received adjuvant radio- and chemotherapy. 8-year survival rate of chondrosarcomas was 100%.

CONCLUSION: Despite the fact that chondroma is aare rarely affecting mobile spinal regions we reported two patients one located on thoracic and another on lumbar spine. Gross-total resection is essential for reducing recurrence. Combined anterior and posterior approaches can help surgeons to achieve gross-total resection.

Keywords: Chordoma, chondrosarcoma, primary bone tumor, posterior instrumentation, en-bloc gross-total resection, beam proton radiotherapy.

Poster Bildiriler

PP-079

LONG-TERM COMPLICATIONS IN DEGENERATIVE SCOLIOSIS

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Patients with degenerative scoliosis are advanced age patients and their management is difficult to manage due to medical comorbidities such as osteoporosis and heart failure. Therefore, high complications are common in patients operated by conventional methods. In this study, we retrospectively evaluated degenerative scoliosis cases who underwent long - segment stabilization of Brain and Nerve Surgery in Bakırköy Mental and Neurological Diseases Hospital between 2011-2016. Short and long-term complications were determined; Prevention and treatment methods were discussed.

METHOD: We retrospectively evaluated the degenerative scoliosis cases with a follow-up of at least 2 years from 82 patients who underwent long segment operation in our hospital between 2011-2016. Nineteen cases whose initial operations were in external centers, were operated due to neighboring segment stabilization and tumoral reasons were excluded from the study. Intraoperative, peroperative and postoperative data were analyzed. Clinical and radiological analyzes were performed for early, late complications and uncomplicated cases during the 2-year follow-up period.

RESULTS: Out of 63 patients, 44 (70%) were female and 19 (30%) were male. At least 12 months were followed up. Twenty-one patients (21 patients, 21 patients) were treated in two sessions and TLIP was applied by transpedicular screw fixation. Long segment fusion was achieved in all patients. Early complications (eg wound discharge, paresis, screw loosening, etc.) were seen in 14 patients. Reoperation was performed in 4 patients and 10 patients were followed by wound site revision and antibiotherapy under local anesthesia. Late segment complications were the most common cause of adjacent segment failure. Screw loosening was detected in the CTs of approximately 4 patients. The common features of these patients were BMI> 30 and bone T score <1 despite treatment recommendations. No complication was observed in 42 patients in the minimum follow-up period.

RESULT: Patients with degenerative scoliosis are at high risk of operation due to advanced age and additional chronic diseases. Because of perop and postoperative complications, degenerative scoliosis cases are recommended in surgical centers with experienced surgeons and anesthesia team. For best results, the stabilization segment and decompression levels should be planned prior to the operation considering the patient's current complaints, comorbidities and expectation. Further studies on patient selection, decompression and / or stabilization levels are needed.

Keywords: Degenerative Scoliosis, Stabilization, Fusion, Decompression

Poster Bildiriler

PP-080

A NEGLECTED TRAUMATIC DISLOCATION WITH THORACAL FRACTURE IN A PATIENT WITH ANKYLOSING SPONDYLITIS: CASE REPORT

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INTRODUCTION AND AIM: Ankylosing spondylitis is a chronic inflammatory joint disease that begins before the age of 30 and particularly involves the axial skeleton. The fusion that develops in facet joints and intervertebral discs in the late period typically leads to bamboo cane spine seen on X-rays. Rigid global kyphotic deformity occurs after ligamentous ossification of the spine and syndesmophytozis. Demineralization in the corpus leads to a risk of spine fracture that may occur with minor traumas. It is similar to pathological fracture in many ways because it develops mostly after minor traumas. These fractures are unstable, easily displaced, and there are always three columns broken. Cord injury is 11.4 times more frequent compared with the normal population. Our aim in this case report is to underscore the importance of detailed questioning of trauma history and radiological evaluation among patients with ankylosing spondylitis.

RESULTS: A 45-year-old male patient had an in-vehicle traffic accident 20 days ago. He was admitted to the emergency service with back pain, but he was discharged with analgesic treatment without radiological imaging. The patient was admitted to our clinic with complaints of weakness in the lower extremities that started 2 weeks later. The patient had a history of ankylosing spondylitis diagnosis, and physical examination revealed paresthesia in the lower extremities, and muscle strength was 3/5. Direct X-ray and computed tomography were conducted. The patient had dislocation with T11-12 vertebral fracture. Emergency MRI was performed due to the neurological deficit in the patient, and MRI results showed diffuse edema in the medulla spinalis at the level of fracture-dislocation. The patient was admitted to the ward and was taken to surgery after prep. Posterior instrumentation was performed due to intraoperative instability. There was no change in the neurological deficit of the patient in the early postoperative period and patient's lower extremity muscle strength was 5/5 in the outpatient clinic follow-up two weeks after the operation.

CONCLUSION: Vertebral fractures are more common in patients with ankylosing spondylitis compared with the normal population, and major spinal injuries may occur even in low-energy traumas. Therefore, detailed anamnesis should be taken in patients with ankylosing spondylitis, detailed physical examination should be performed, and advanced radiological examinations should not be avoided in suspicious cases. Thus, we believe that misdiagnosis of these patients can be prevented.

Keywords: Ankylosing Spondylitis, Dislocation with Vertebral Fracture, Neurological Defısıt

resim 1

Poster Bildiriler

PP-081

POSTOPERATIVE SHORT TERM RESULTS OF LUMBAR SPINAL STENOSIS PATIENTS OVER 80 YEARS OLD

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INTRODUCTION: Lumbar spinal stenosis (LSS) adversely affects the quality of life in the elderly population and can be progressively debilitating if not treated. Surgery is inevitable for the patients who does not respond to conservative treatment. In this study, we present postoperative 6 month results of 15 patients, who avoided surgery due to age-related risk factors.

MATERIAL-METHOD: 15 patients aged over 80 years old with LSS who underwent surgery between 2018-2019 were included in the study. All patients had hip pain and difficulty during walking. The mean walking distance of the patients was 150 meters. All of the patients had received conservative treatment (medical therapy, physiotherapy, spinal injections etc.) at least 6 months and did not benefit from it. All of them was offered surgical treatment at different medical centers, but avoided surgery because of the risks. For surgery, short segment bilateral pedicle screw fixation, facetectomy, laminectomy and foraminotomy was utilized for the affected lumbar segments of all patients. None inter-body fusion was performed.

RESULTS: Mean surgery time was 2 hours and all patients received 1 erythrocyte suspension during the surgery. None of the patients needed intensive care unit support postoperatively. All patients were ambulatory at the postoperative first day and reported marked relief of their symptoms. Also all patients reported marked increase in walking distance at early postoperative period. Mean hospitalization period was 5 (3-8) days. Two patients were hospitalized 8 days due to CSF drainage from the drain which resolved spontaneously. 2 patients were prescribed pregabalin at early postoperative period and their symptoms completely resolved in 3 months. After discharge from hospital, 5 patients were treated by internal medicine specialists for their fatigue due to chronic anemia. 1 patient suffered drop-leg postoperatively and did not recover in 6 month period. None of the patients passed away in the 6 month period.

CONCLUSION: Surgical treatment of LSS is challenging and prone to complications. The incidence and the age of occurrence are also increasing due to increased life expectancy. Our results show that with meticulous surgical technique and peri-operative care, LSS patients over 80 years old could be successfully treated yielding correlative postoperative complication rates for younger age groups. Careful patient selection and management of other concomitant medical problems yields good results and it should be kept in mind that surgery is an option for the patients over 80 years old.

Keywords: lumbar spinal stenosis, elderly, population

Poster Bildiriler

PP-082

CLINICAL PRESENTATIONS AND SOCIOECONOMIC FACTORS AFFECTING REHERNIATION OF LDHS: A PROSPECTIVE STUDY

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OBJECTIVE and BACKGROUND: Lumbar disc herniation (LDH) is one of the most common diseases can affect adults. Reherniation is the experience of another LDH at the same level and same side after a pain-free period. Reherniation is a challenging problem for both of neurosurgeon and patient. Causes for a recurrent disc can be multifactorial. Its rate is accounting for 1-21% of the patients who underwent discectomy surgery. In the literature, many reherniation's risk factors had been described. In this study, clinical presentations and socioeconomic factors affecting reherniation after discectomy prospectively have been investigated.

MATERIALS-METHODS: 816 patients were underwent discectomy surgery at Neurosurgery department of BRSHH between the years 2014 and 2015, the patients who followed up at least 36-month and the patients who are appropriate to our study criteria were included. The patients' demographic characteristics such as age, gender, job, BMI, clinical presentations and pre- and postoperative clinical status had been evaluated using Oswestry scale and VAS scores. The patients were divided into who had recurrent LDH and others (control group) and the comparison had been performed between both groups using all above parameters prospectively.

RESULTS: 816 (430 women, 386 men) patients were underwent discectomy for LDH. 842 disc levels were operated. The mean age was 46.9 (17-82). The mean follow-up period was 47.8 (36-61) months. The most common symptom was leg pain (100%). The mean of preoperative leg and back VAS score were 8.9 (7-10) and 3.1 (1-6), respectively. The mean of 12th and 24th month postoperative leg and back VAS score were 1.9 (1-3), 1.64 (0-4), 1.9 (1-3), and 1.82 (0-5), respectively. The mean of preoperative ODI, 12th and 24th month postoperative ODI were 73.3 (52-88), 15 (0-24), and 18.2 (0-26), respectively. Gender, age, symptom's duration, surgery condition and period, trauma, comorbidities, smoking, and early returning to duties are not related to recurrence of LDH in our patients.

CONCLUSION: Deficits on presentation, high socioeconomic status, and conform duties may reduce recurrence risk of LDH. Absence of neurologic deficits and hard duties may increase recurrence risk of LDH.

Keywords: Lumbar disc herniation, recurrent lumbar disc herniation, risk factors, clinical presentation, socioeconomic factors

Poster Bildiriler

PP-083

AMYOTROPHIC LATERAL SCLEROSIS ASSOCIATED WITH LUMBAR SPINAL STENOSIS CANAL: CASE REPORT

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OBJECTIVE: Lumbar spinal stenosis canal is a common pathology after the age of 50, with clinical, radiological and complex treatment. Difficulty in walking, back and leg pain are frequently seen. Lumbar spinal stenosis canal which is accompanied by amyotrophic lateral sclerosis is very rare and we found it appropriate to present this case.

Material **METHODS:** Patient with back pain for 2 years, with both leg pain and difficulty in walking for 1 month. L3-4 L4-5, L5-S1 stenosis canal was seen in the lumbar MRI examination. In the examination of the patient; back movements painful, SLR bilateral free, each 2 ankle dorsiflexion 2/5 strength, DTR of the 1st motor neuron findings in the lower extremity was hyper-active and there were clones of 4-5 beats in both feet. EMG examination was requested. The patient was diagnosed as Amyotrophic Lateral Sclerosis in EMG.

RESULTS: The patient was informed about his condition and the surgical treatment was abandoned. He was consulted by the neurology clinic and transferred to the neurology clinic.

DISCUSSION and CONCLUSION: Lumbar spinal narrow canal is frequently encountered in neurosurgery practice. A detailed neurological examination must be performed. Neurological findings incompatible with the clinic should be investigated and surgical treatment should not be hurried.

Keywords: Lumbar stenosis canal, MR, Amyotrophic Lateral Sclerosis

Poster Bildiriler

PP-084

PRIMARY INTRAMEDULLARY PRIMITIVE NEUROECTODERMAL TUMOR

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PURPOSE: Primitive neuroectodermal tumor is a malignant tumor with poor prognosis. Primary spinal primitive neuroectodermal tumors are uncommon and can be extradural, intradural extramedullary, and intramedullary, of which primary intramedullary primitive neuroectodermal tumors are extremely rarer. These tumors mostly occur in children and young adults. The diagnosis of the primitive neuroectodermal tumors depends on histopathology and immunohistochemistry.

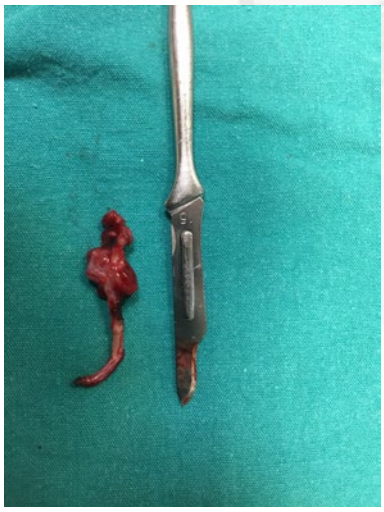
METHODS: 26-year-old male patient was presented with the complaints of low-back pain and right sided leg pain. On his neurological examination, he had hypoesthesia and hyperalgesia at the right L1-S1 dermatome. His spinal magnetic resonance imaging revealed a 25x24x35 mm sized, cystic intramedullary lesion at the conus level (Figure 1). The solid nodular compartment of the lesion had homogeneous dense contrast enhancement after gadolinium administration (Figure 2).

RESULTS: He underwent tumor resection with L2-L4 laminoplasties via posterior approach. Cystic compartment drained out and solid nodular compartment was resected totally with microsurgical technique (Figure 3). The postoperative course was uneventful and postoperative spinal magnetic resonance imaging showed total resection of the tumor (Figure 4). The histopathological examination of the tumor revealed primitive neuroectodermal tumor diagnosis and oncological treatments were started.

CONCLUSION: Primitive neuroectodermal tumors should be considered in the differential diagnosis of an intramedullary spinal cord tumor manifesting as progressive neurological deterioration. The therapy of these tumors mainly includes surgery, radiotherapy, and chemotherapy; however, the prognosis of these tumors is poor.

Keywords: Intramedullary, primitive neuroectodermal tumor, spinal tumor, laminoplasty

Figure 3



Peroperative image of the resected tumor.

Poster Bildiriler

PP-085

THE LAZY NONSPORTIVE YOUTH OF INDUSTRIAL AGE GOES TO EXTRUDED DISC HERNIATION IN THE EARLY PERIOD

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AIM: We have searched for young patients with exruded lumbar disc herniation in the past year. In our study, we would like to draw attention to the advanced disc diseases seen in young people. The aim of us to investigate the reasons of younger disc herniations.

MATERIAL METHODS: This is a prospective analysis of 33 young patients (16females,17males) with extruded lumbar disc herniation and managed by conservatively (medical and physical therapy) or surgically between years 2017 and 2018. The mean age was 25years (range:17-30). Neurological examinations was done. Smoking, familial predisposition, sportive activation and occupation of the patients were questioned and noted. The visual analog scale (VAS) was used to assess the efficacy of pain management regimens in patients. Body-mass index was calculated.All patients had lumbar magnetic resonance imaging.

RESULTS: Eighteen patients(8females,10males) had L5-S1 extruded disc, whereas 12patients(8females,4males) had L4-L5 extruded disc. Three other patients had two levels (L4-L5andL5-S1) extruded discs. Motor deficits were detected in four patients and surgical treatment was required and performed. The other 28 patients were treated conservatively. When the occupations of the patients were examined, it was observed that they all sat on the day and deprived of movement. The number of smokers was 20(%61). The main of body mass index was 32.5kg/m2. The average follow-up was 12months. Of the patients who underwent surgery, 3 were L4-L5 level. One of them had right L5 radiculopathy and motor defisit while the others was left. Also they had both L5 sensory decifit and coronal imbalance. Discectomy and interbodyfusion surgery were performed in these patients. The other patient had 2-level (L4-L5 and L5-S1) surgery who had severe pain and two levels motor deficits. Only disectomies were performed on this patient. Pain medication and physical therapy were performed in conservatively treated patients. In these patients without sports habits, spine ergonomics were explained and regular walks started. They were encouraged to lose weight by dietitians. Smoking cessation therapy was started for smokers.VAS score was statistically decreased at the follow-up($p<0.05$). At the last controls, all patients had started their regular sports habits, walked for 1hour daily and paid attention to ergonomics. Unfortunately, only 3patients left smoking.

CONCLUSION: Understanding how spine degeneration can affect the likelihood of developing a herniated disc can help people make small lifestyle changes to possibly postpone any serious pain and deficits. While aging is unavoidable, simple lifestyle changes can help improve the overall spine health and deter the risk of developing a degenerative spine condition.

Keywords: nonsportive youth, disc herni, industrial age

Poster Bildiriler

Figure **1**

preop MRI & postop Xray

Poster Bildiriler

PP-086

HYBRID ROD SYSTEMS FOR THE PREVENTION OF ADJACENT SEGMENT PATHOLOGY: PRELIMINARY CLINICAL SERIES

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The number of segmental spine stabilization continues to increase. Therefore, adjacent segment disease is more frequently diagnosed day by day and in general, this situation is treated by the extension of the surgical system. However, apart from extending the system, it gets even more complicated because this disease usually recurs on the cranial side of the system. Unfortunately, full dynamic system applications cannot be applied in pathologies that require bone fusion, such as spondylolisthesis or traumatic fractures.

In our research, we aimed to solve this problem. Thus, we present the early clinical results of three patients who were operated with a hybrid rod which was designed, created and ultimately innovated by us, using the combination of a rod system made of rigid titanium-aluminum-vanadium alloy and a semi-elastic rod system. The patients were operated for degenerative lumbar pathologies and the stabilization with six screws and total laminectomy in the related segment were performed in all of them. The rigid rod section was located between the screws of the principal pathology (spondylolisthesis - spondylosis) and the dynamic section was placed to cover the upper healthy disc space. VAS, adjacent segment flexion-extension angle and adjacent segment disc heights of all patients were determined preoperatively and 3 months after the operation. Then, the statistical meaning of the difference between the values was investigated. In the light of our results; there is a staggering and meaningful difference in VAS values, even though the difference in other parameters is limited and not immense. As expected, screw malposition, system failure or any operative complications weren't observed in any of the patients. The follow-up procedures of them are still in progress. Although the follow-up time may seem short at first glance, the results of this investigation suggest that our hybrid rod systems gives brilliant hope as a robust tool in the treatment and the prevention of adjacent segment disease even at traumatic and degenerative cases that requires segmental solid fusion also.

Keywords: Adjacent segment, Hybrid rod, Prevention

Poster Bildiriler

PP-087

COMPLICATIONS OF POSTERIOR INSTRUMENTATION AND FUSION SURGERY DUE TO CERVICAL SPONDYLOTIC MYELOPATHY

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GOAL: Posterior cervical stabization methods are common in the prevention and treatment of sevical instability is a surgical option. In our study, between 2014 and 2018 lateral mass and per-op in cases of posterior cervical stabilization using transpedicular screwing complications associated with postoperative and postoperative follow-up, associated with screw and rod system The problems and surgical results are discussed.

METHOD: In our study, myelomalacic signal changes on MRI with 3 levels and cervical stenosis in patients with deformity, clinically spastic tetraparetic patients between 2014 and 2018 posterior cervical stabilization used lateral mass and transpedicular screw In our stoudy patients followed-up of at least 1 year and rod system related problems are discussed retrospectively.

RESULTS: In our study, 37 patients, a total of 432 screws with total lateral mass and transpedicular methods the spinal cord injury associated with the screw was not seen. Vertebral artery injury had been in 1 patient (2.7%) and 2 (% 5,4) patients had cervical nerve root damage. In post-op follow-up, 6 patients had mechanical problems (3 screw fractures 3rod fractures) and revision surgery was performed. 3 (8%) post-op wound infection was seen in the patient.

RESULT: Posterior cervical stablization methods have serious complications. Similar problems in the literature on this issue of all spine surgeons in this regard problems. The screw-rod complication rates seen in our study According to the literature is low. The reason for this is a good pre-operative preparation, correct level and correct technique We believe that the selection is as short as possible and appropriate patient selection. It is obvious that all the surgeons will benefit as the publications related to complications and prevention prevent them.

Keywords: spine, surgery, cervical, complications

Poster Bildiriler

PP-088

PRECURSOR B-CELL LYMPHOBLASTIC LYMPHOMA PRESENTING AS SPINAL EPIDURAL LESION CO-EXISTING WITH ANEURYSM OF BIFURCATION OF RIGHT MIDDLE CEREBRAL ARTERY

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INTRODUCTION: We present a case of lumbosacral epidural precursor B-cell lymphoblastic lymphoma in a 62-year –old woman. The spinal cord is an extremely rare initial site of involvement for precursor B-cell lymphoblastic lymphoma.]. In our case we report a patient lumbosacral precursor B-cell lymphoblastic lymphoma coexting with bifurcation of right middle cerebral artery aneurysm.

METHOD:

Case report

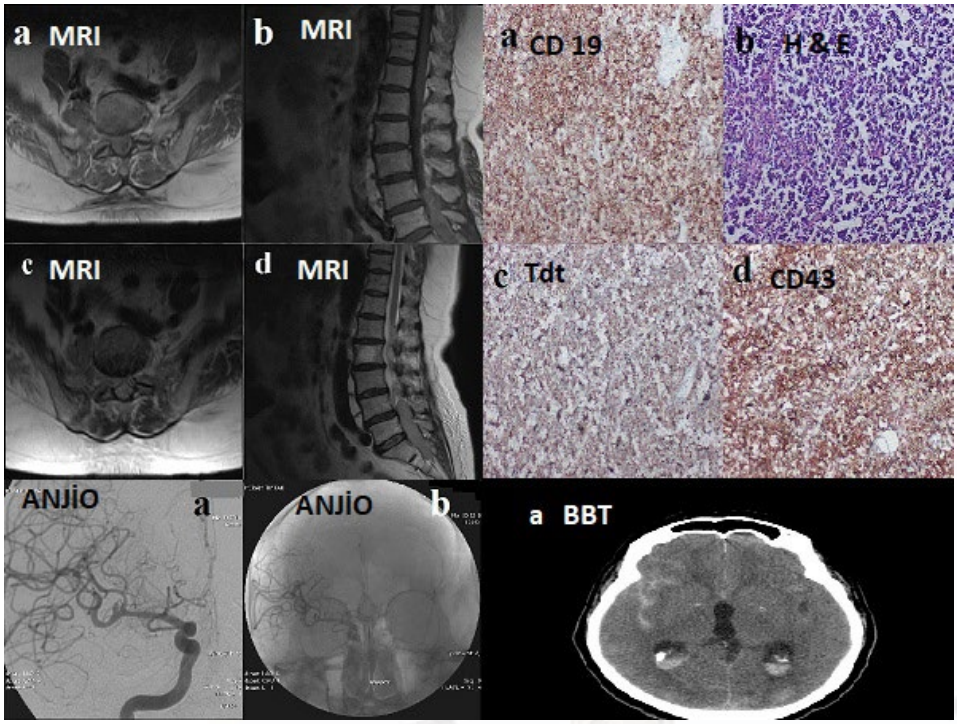
CASE: 62-year-old female patient was admitted with 1 month history of pain and numbness in right lower limb. Magnetic Resonance Imaging (MRI) revealed lumbosacral mass lesion. After hospitalization, neurological examination, power was 2/5 at right ankle and knee joints, 4/5 at left ankle and knee joint, straight leg raising test was restricted to 45 degree on right side, free on left side. Sensorial examination revealed hypoesthesia at level of L4 and L5 region. MRI of the spine revealed an extramedullary extradural lesion at lumbosacral region at L4 - S4 level causing marked spinal cord compresion. Radiologically reported as menengiom or nevre sheat lesion. The patient was operated with L4-S3 laminoplasty and total excision of the lesion. Histopathologically lesion was reported as precursor B-cell lymphoblastic lymphoma. The patient complaints were improvement gradually and discharged at 10 days later after operation. Three weeks later the patient presented emergency department with vomiting, nausea, headache. Emergency CT findings revelaed subarachnoid hemorrhage, then the patient hospitalized again. Cerebral angiography showed aneursym of bifurcation of right MCA and at same operation embolisation was performed

RESULT: Spinal lymphoma is a rare condition and differantial diagnosis is made from other metastases. Careful evaluation is needed and radiological imaging techniques must be used; but surgery is the mainstay method both treatment and definite diagnosis. In our case spinal precursor B-cell lymphoblastic lymphoma coexiting with cerebral aneurysm related or not each other but is a first case reported.

Keywords: Aneurysm, Cerebral, Lymphoma, Spinal

Poster Bildiriler

MRI, ANGIO, HISTOPATHOLOGY, TOMOGRAPHY



Contrast-enhanced Magnetic Resonance imaging showed minimally hyperintense extratradural mass lesion between L4-S2 vertebrae (MRI a,b,c,d). Cerebral anjiography showed pre-op (Anjio a) and post-op (Anjio b) right middle cerebral artery bifurcation aneursym. Pathological tisssue sections showed Precursor B-cell lymphoblastıc lymphoma cells,(a) immunohistochemistry CD19 (100X), (b) H&E (100X), (c) immunohistochemistry Tdt (100X), (d) immunohistochemistry CD43 (100X) Cranial Computerized Tomography showed subarachnoid hemorrhage due to bifurcation of right cerebral middle serebral artery bifurcation aneursym (a BBT).

Poster Bildiriler

PP-089

CERVICAL SYRINGOMYELIA PRESENTING WITH SCAPULAR WINGING: A CASE REPORT

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INTRODUCTION: Scapular winging is a rare condition leading to cosmetic deformity, and functional limitation. It is more common in children than in adults, and mostly missed or underdiagnosed.

CASE DESCRIPTION: We reported a 17.5-year-old boy with a 6-month history of muscle weakness, and pain radiating from his right shoulder to his upper arm and back. Exercising and lifting aggravated his pain. His physical examination showed normal cervical range of motion and limited shoulder abduction. He had atrophy and weakness in his right shoulder girdle muscles. He had no pathologic findings in sensory and motor nerve conduction studies including F waves. However, his needle electromyography showed abnormal spontaneous activity at rest, and polyphasic, high-amplitude motor unit potentials during voluntary activity in his right deltoid, biceps brachii, major rhomboid, serratus anterior, flexor carpi radialis and C6 -level cervical paraspinal muscles. He had chronic denervation signs in his deltoid and biceps brachii muscles. His cervical magnetic resonance imaging revealed a small central cord lesion between C6 and C7 vertebral bodies. The patient was followed up for 1.5 years. He received 2 sets of rehabilitation program. Each rehabilitation program took 14 sessions including shoulder strengthening and scapular muscle stabilization exercises His condition improved after rehabilitation.

DISCUSSION: Scapular winging most commonly caused by nerve injuries, muscle injuries, trauma, and tumors. It has rarely been reported in patients cervical myelopathy, and cervical syringomyelia. Scapular winging is rare sign of cervical syringomyelia and needs prompt evaluation. We suggest that syringomyelia should be kept in mind in the differential diagnosis of scapular winging.

Keywords: adolescent, syringomyelia, scapular winging, cervical spine

Poster Bildiriler

PP-090

OUR RESULTS AFTER 360-DEGREE STABILIZATION BY APPLYING HEMIVERTEBRECTOMY AND PLACING ANTERIOR SUPPORT WITH POSTERIOR APPROACH IN OSTEOPOROTIC VERTEBRAL BURST FRACTURE

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GOAL: To evaluate the clinical and radiological efficiency of 360-degree stabilization operation by applying hemivertebrectomy and placing anterior support with posterior approach in cases of acute and chronic osteoporotic vertebral burst fractures.

METHOD: Between 2013 and 2018, 12 patients (2 males, 10 females) who underwent surgery for acute and chronic osteoporotic vertebral burst fractures between the ages of 43-82 years (mean age; 68) were investigated for postoperative- preoperative pain, neurological deficit, hospitalization time, operation time, segmental kyphotic angulation, amount of anterior vertebral corpus height restoration, postoperative-preoperative complication, and OF radiological classification scores (3 patients with grade3, 5 patients with OF Grade4 and 4 patients with grade5) retrospectively. Patients with vertebral tumor-induced burst fracture were excluded from the study (5 patients).

RESULTS: We performed 360-degree stabilization operations by applying hemivertebrectomy and placing anterior support with posterior approach due to acute and chronic osteoporotic burst fracture (mean operative time 409.5 minutes) in all 12 patients with a mean hospital stay of 10.3 days. postoperative VAS scores decreased, Frankel scores improved at least one-point, anterior corpus height restoration was achieved, and segmental kyphotic angulation decreased except for 2 patients.

DISCUSSION: In the cases of osteoporotic vertebral burst fractures, 360-degree stabilization operation by applying hemivertebrectomy and placing anterior support with posterior approach is a method with satisfactory results both clinically and radiologically.

Keywords: osteoporosis, vertebral burst fracture, hemivertebrectomy, anterior support

Poster Bildiriler

PP-091

SPINOPELVIC FIXATION WITH DOUBLE ILIAC SCREW AND DOUBLE ROD IN THE SURGICAL TREATMENT OF LUMBAR DEGENERATIVE DISEASE

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AMAÇ: Erişkin dejeneratif spinal hastalıkların cerrahi tedavisinde füzyona sakrumun da dahil edilmesi lumbosakral bileşkede pseudoartroz ya da implant yetmezliği gibi bir takım komplikasyonlara neden olmaktadır. Bu nedenle spinopelvik fiksasyonu amaçlayan pek çok teknik tarif edilmiştir. Bu çalışmanın amacı modifiye distal iliak vidalama kullanılarak çift iliak ve çift rod sistemi ile spinopelvik fiksasyon yapılan hastaları klinik ve radyolojik olarak retrospektif incelemek, yöntemin uygulanabilirliğini ve efektivitesinin değerlendirmektir.

YÖNTEM: Lomber dejeneratif patolojiler nedeni ile distalde sakrumun füzyona dahil edildiği ve bu nedenle spinopelvik fiksasyon yapılan 11 ardışık hasta çalışmaya dahil edildi. İlk olarak distal iliak vida her iki posterior iliak spine arasındaki çentikten, iliak kanadın medialinden girilerek, siyatik çentikten minimum 5 mm proksimalden geçecek şekilde yerleştirildi. Proksimal iliak vida spina iliaka posterior inferior seviyesinde iliak krestin hemen medialinden distal vidaya paralel şekilde yerleştirildi. Sakrum ve diğer vertebralardaki pedikül vidaları birinci rod ile kilitlendi. İliak vidalar konnektörler ve ikinci bir rod aracılığı ile sisteme fikse edildi.

BULGULAR: Çalışma grubu 10 kadın ve 1 erkekten oluşmakta idi. Hastaların ortalama takip süresi 14,5 (12-17) ay bulundu. Cerrahi sırasında yaş ortalaması 65,5 (48-80) yıl idi. 2 hastaya daha önce lomber diskektomi, 3 hastaya posterior enstrumentasyon ve laminektomi, prosedürü uygulanmıştı. Revizyon cerrahisi endikasyonları; iki seviye ve üzeri lomber dejenerative disk hastalığı, lumbar spinal kanal stenozu, segmental instabilite ve denovo skolyoz idi. Proksimal enstrumentasyon seviyesi 1 hastada T5, 3 hastada T10, 1 hastada L1, 4 hastada L2, 1 hastada L3, 1 hastada L4 idi. İliak vidaların koronal planda açısı her iki iliak kanat en proksimalini birleştiren çizgi, sagittal planda açısı ise sakrum üst end plate klavuz alınarak ölçüldü. İliak vidaların ortalama boyu 9 mm, ortalama uzunluğu 103,4 mm, ortalama koronal açısı 30,1 derece, ortalama sagittal açısı 17,5 derece olarak ölçüldü. T9-iliak enstrumentasyon tapılan bir hastada proksimal komşu segment kırığı gelişti, enstrumentasyon T5 vertebraya kadar uzatıldı. Takip boyunca hiçbir hastada implant yetmezliği, kaynama problemi, cilt altında belirgin ağrılı implant, yara kaynama gecikmesi ya da enfeksiyon gözlenmedi.

SONUÇ: Modifiye çift iliak vidalama ve çift rod sistemi ile sakropelvik fiksasyon güvenli ve etkili bir yöntemdir. Çift iliak vida ile sakropelvik fiksasyonun mekanik gücünü artırmak, çift rod kullanarak koronal planda rodları bükmeye gerek kalmadan fiksasyonu sağlamak, modifiye distal iliak vidalama ile klasik iliak vidalarının dezavantajlarından kaçınmak, sakroiliak eklemden geçmeyen vidalar kullanarak olası postoperatif sakroiliak ağrıyı azaltmak mümkündür.

Keywords: İliac screw, Spinopelvic fixation, Double rod, Lumbar degenerative

Poster Bildiriler

PP-092

CAN SAGITTAL VERTICAL AXIS (SVA) BE A USEFUL CLINICAL MARKER FOR THE SEVERITY OF LOW BACK PAIN?

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INTRODUCTION: In this study, we investigated the relationship between the severity of low back pain and sagittal balance, and whether it is possible to use this relationship as a clinical evaluation scale. Today, evaluation scales such as VAS (Visual Analog Scale), ODI (Oswestry Disability İndex) are used to determine the severity of low back pain. The most important feature of these scales is that they are subjective. Differences in the personal perception of pain make the measurements subjective. Many studies have clearly demonstrated the relationship between adjustment disorders and pain and quality of life in the sagittal plane of the spine. The SVA is one of the most easy-to-measure parameters that determine the global sagittal balance. Patients with impaired sagittal balance spend more energy to keep the spine stable, and these patients have more pain.

METHOD: In this study, 100 patients aged between 18 and 80 with low back pain were examined. 33 patients previously had stabilization surgery in the posterior. 34 patients underwent non-instrumental spinal surgery and 33 patients had no surgery. The severity of low back pain was recorded with VAS and ODI scales and the SVAs of all patients were measured using the Surgimap software program. The relationship between the severity of low back pain and VAS, ODI scales and SVA was investigated.

RESULTS: The severity of low back pain was found to be high if the SVA was impaired. This was more evident if the patient had undergone posterior stabilization surgery.

DISCUSSION AND CONCLUSION: SVA is an important criterion for evaluating global sagittal balance. But it is not always enough alone. Spinopelvic parameters and SVA should be evaluated together. In patients with aging and osteoporosis, SVA goes into deterioration and this should be considered in surgical planning. The other pain scores are high, especially in operated patients, if SVA is impaired. Postoperative pain recovery may be less in the surgeries without SVA correction. Pain scores such as VAS and ODI are subjective, and SVA measurement can be a useful predictor of the severity of low back pain, especially in revision surgeries.

Anahtar Kelimeler: Sagittal Vertikal Axis (SVA), Low Back Pain, Sagittal Balance

Poster Bildiriler

PP-093

SPINAL CORD STIMULATION IN A PATIENT WITH MULTIPLE SCLEROSIS AND FAILED BACK SURGERY SYNDROME

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In the present article, we described a case of treating intractable pain from failed back surgery syndrome (FBSS) and multiple sclerosis (MS) after implantation of spinal cord stimulation (SCS) in a patient. Failed back surgery syndrome (FBSS) is the most common indication for spinal cord stimulation (SCS). It is often characterised by disabled back and/or radicular limb pain following spinal surgery, with neuropathic and nociceptive components that are often insufficiently responsive to conventional therapies such as reoperation or medical treatment. Multiple Sclerosis (MS) is a chronic demyelinating autoimmune disease and the most frequently occurring type of neuronal demyelination. Information regarding the effectiveness of SCS for MS pain is lacking in the literature. We describe a successful case of treating intractable pain from FBSS and MS in a patient after implantation of SCS. To our knowledge, this is the first case in the literature where SCS has been used for treating a patient with both FBSS and MS.

Keywords: Failed back surgery syndrome, multiple sclerosis, spinal cord stimulation

Poster Bildiriler

PP-094

DEMYELINATING DISEASES MAY INTERFERE WITH CERVICAL INTRAMEDULLARY TUMORS

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Neuromyelitis optica (NMO) (Devic's syndrome) and multiple sclerosis (MS) are different types of demyelinating diseases. MS and NMO incidence are %0,01. Although spinal cord involvement is common in patients with NMO, spinal cord involvement in patients with MS is 5%. Because of these diseases are rare, it is important to diagnose NMO or MS. In this case report, 3 cases diagnosed as demyelinating disease were mentioned.

MATERIAL VE METOD: The first case, a 65-year-old female patient, has loss of strength in the left upper and lower extremities, which had started 1 week ago; In addition, she had fecal incontinence that happened only one time 5 days ago. She was admitted to our outpatient clinic with these complains. The second case, a 23-year-old female patient, presented to our clinic with loss of strength in the left upper and lower left extremities which started 1 week ago. The third case, was a 49-year-old female patient with neck and right shoulder pain that started one month ago. In addition, urinary incontinence, and detoriation of fine motor movements which started 1 week ago. She was admitted to our clinic with these complaints.

RESULTS AND DISCUSSION: In the cervical MR images of three patients, intramedullary contrast enhancement lesion was detected. The first patient was diagnosed as an intramedullary mass and a mass excision was performed. In the light of the experience obtained from this patient, the other two patients underwent advanced laboratory investigations. As a result of laboratory tests, a patient was diagnosed with NMO and the other patient was diagnosed with MS.

CONCLUSION: It has been emphasized that demyelinating diseases can mimic the intramedullary tumors and should be considered in the differential diagnosis of cervical intradural lesions.

Keywords: neuromyelitis optica, multiple sclerosis, demyelinating disease, servikal, intramedullary tumor,

Poster Bildiriler

PP-095

COMPARISON OF TITANIUM AND POLYETHERETHERKETONE CAGES IN PATIENTS WHO UNDERWENT ANTERIOR CERVICAL DISCECTOMY AND FUSION OPERATION

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GOAL: Titanium and polyetheretherketone (PEEK) cages are widely used for intervertebral disc space reconstruction and both accepted grafts for anterior cervical discectomy and fusion. We evaluated and compared clinical and radiological outcomes of titanium and polyetheretherketone cages used for fusion in anterior cervical discectomy operation.

METHOD: Clinical and radiological outcome were assessed in 46 eligible patients (operated between 2016-2018) after a mean of 18.4 months follow up. 24 patients (10 male, 14 female) received Titanium cage and 22 patients (10 male, 12 female) received PEEK cage. We investigated for preoperative and post operative VAS score, neck disability index, cage subsidence, pseudoartrosis, solid arthrodesis, segmental lordotic correction.

RESULTS: We observed that the pain of the patients is significantly reduced. Fusion rate was found in 91,6% in titanium group and 90% in the PEEK group. Cage subsidence was observed in 12,5% in the TTN and 22,7% of the PEEK-group.

DISCUSSION: In contrast to most of the recent publications we found rate of cage subsidence in the titanium group lower than in the PEEK group. But there was no significant clinicial difference between those 2 groups.

Keywords: Polyetheretherketone Cage, Titanium Cage, Anterior cervical discectomy, fusion

Poster Bildiriler

PP-096

IMPORTANCE OF SAMPLING IN POSTOPERATIVE SPONDYLODISCITIS

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INTRODUCTION: Spondylodiscitis is the infection of the intervertebral discs and the neighboring vertebra. In pyogenic spondylodiscitis, most common pathogens are Staphylococcus aureus, Enterobacter sp. and Streptococcal sp. Imaging methods are important in diagnosis and observatIon of the treatment. Erythrocyte sedimentation rate and C-reactive protein values can be used to measure the response to the treatment. Culture results are the determining factor in choosing the right antibiotic treatment. In spondylodiscitis, detection of Coagulase-Negative Staphylococci is regarded as contamination. Below, the treatment for Coagulase-Negative Staphylococci in spondylodiscitis is discussed.

CASE: 74 year old male patient presenting with lower back pain, radiating numbness in the right leg and difficulty walking without assistance for a month. Two months prior to presentation, the patient had laminectomy for lumbar spinal stenosis, posterior spinal instrumentation and fusion. At the site of operation, between L3-S1, following the intravenous contrast media administration, a 74x35 mm peripherally enhancing collection of fluid was detected in MRI. Sample was collected using fine-needle aspiration biopsy. Blood test results revealed leukocyte count of 14500, ESR of 110 mm/h, CRP of 53 mg/L. Amoxicillin/clavulanic acid was started as empirical therapy. Biopsy cultures revealed Coagulase-Negative Staphylococci and the treatment was continued with amoxicillin/clavulanic acid. Three month after the treatment was started, MRI revealed abscess reduced to 33x18 mm in size. In the fifth month of treatment, MRI revealed no abscess and the antibiotic treatment was discontinued. At the end of treatment, blood test results revealed leukocyte count of 9,94 10^9/L, ESR of 11 mm/h, CRP of 3 mg/L. Patient reported no mobility issues and significant decrease in pain.

DISCUSSION: Postoperative spondylodiscitis is a common, important and serious complication of spinal surgery. Drainage of abscesses has a major role in treatment however wherein immediate surgical treatment is not indicated, medical treatment should be considered. Clinical, radiological and lab findings should be assessed together in diagnosis. When it comes to antibiotic selection, culture and antibiotic susceptibility test is the gold standard. Coagulase-Negative staphylococci are normally found on skin flora and commonly regarded as contamination from the insertion side of the needle. However, if these organisms are isolated following multiple repeat cultures, they should be considered as the agents of infection.

Keywords: Spondylodiscitis, Culture, Antibiotic, Abscess, Coagulase Negative Staphylococcus

Poster Bildiriler

PP-097

CERVICAL CORPUS AUTOGRAFT APPLICATION AFTER CERVICAL CORPECTOMY; TECHNICAL NOTE

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PURPOSE: Anterior cervical corpectomy and fusion (ACCF) is a surgical technique that is widely used in anterolateral approach to pathologies such as cervical spondylosis, which require multiple levels of decompression. In our clinic; we perform the cervical corpectomy by protecting the cortical bone and then we obtained tricortical spongiosis. Then we used that as an autograft.

MATERIALS and METHODS: Two patients who were admitted to our clinic with radiculopathy were diagnosed with 3 level cervical spondilosis. Anterior cervical corpectomy and fusion operation was performed. During the operation; the cervical corpectomy was performed by protecting the cortical bone at the rostral, anterior and caudal sides of the vertebral corpus and tricortical spongious bone was obtained. It was thought that the tricortical spongious bone may be suitable for autograft use. There are studies reporting that this technique is highly successful in achieving bone fusion and clinical improvement. Autograft, allograft, nano-hydroxyapatite / polyamide cage, polyetherketone (PEEK) cage or titanium cages may be used to provide fusion. A second surgical incision is needed to obtain the appropriate cortical-assisted spongiose bone, such as iliac wing, manubrium sterni or fibula, which is frequently preferred as autograft. It is known that this situation increases the operation time, blood loss and postoperative pain.

RESULTS: Two patients who presented to our clinic with radicular pain and myelopathy were diagnosed with cervical spondylosis. Patients underwent one level anterior cervical discectomy and corpectomy was performed to cover the other two disc level. The tricortical corpus fragment obtained during the corpectomy was used as an autograft at the level from the discectomy. A titanium cage was placed in the corpectomy distance and the entire system was fixed using a screw-plate. Preoperative and postoperative neurological examinations of the patients showed improvement.

CONCLUSION: If the integrity of the vertebral corpus is partially protected during cervical corpectomy, the resulting bone tissue can be used as an autograft in selected multiple distance spondylosis cases.

Keywords: Anterior, Cervikal, Corpectomy, Discectomy, Autogreft, Fusion

Poster Bildiriler

PP-098

THE BENEFITS OF USING PATIENT-SPECIFIC THREE-DIMENSIONAL MODEL IN SPINE TUMOR SURGERY; EVALUATION OF THREE CASES

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AIM: The aim of this study is to evaluate if creation of preoperative three dimentional (3D) patient-specific life-size model of spinal complex tumors will assist interprofessional level surgeons in making operative plans including its presentation, diagnostic tools, surgical guide, and surgical outcome.

MATERIALS-METHODS: Three patients (2 sacral condrosarkoma and one thoracal osteosarcoma involving thoracal spine) operated because of spinal tumor in our clinic included in this study. High-resolution images were acquired and utilized to generate a patient-specific 3D tumor model. Individual models of three cases was reconstructed from the DICOM file of the CT data. Surgical team (orthopaedic oncolog surgean, orthopaedic spine surgean, general surgean, orthopaedic fleb surgean and thoracic surgean for thoracal osteosarcoma) explained their surgical experience of the use of 3D life-size individual model for guiding surgical treatment. Before patients consented to surgery, each surgeon explained the surgical procedure and perioperative risks to patients. A questionnaire was applied to 10 surgical residents to evaluate the 3D model's perception.

RESULTS: 3D model's perception was detected statistical significance as < 0.05. The visual and tactile inspection of 3D models allowed the best anatomical understanding, with faster and clearer comprehension of the surgical anatomy. 3D model scans were useful in determining the site of the lesion, the exact size, extension, attachment to the surrounding structures. The 3D models were for observation of previously unapparent anatomical details; with this new technology, surgeon can observe their planned surgical intervention, explore the patient-specific anatomy and extension of the tumor, and sharpen their procedure choices. Moreover, multiple planes showed how far the angles on the plane would extend for osteotomy of the affected spine. Another result was identifying correct guides and safe venture landmarks. This study helped to establish safe osteotomy line wherever the nerve roots were retained and enabled osteotomy by preserving uneffected nerve roots for wide excision tumor to get adequate bowel, bladder and motor functions. Finally, it helped to determine whether or not the remaining bone in affected spine is sufficient for stability and needed fixation.

CONCLUSION: 3D tumor model helps to transfer complex anatomical information to surgeons, provide guidance in the pre-operative planning stage, for intra-operative navigation and for surgical collaboration purposes.

Keywords: 3D Printing Model, Spine Tumor Surgery, Surgical Planning

Poster Bildiriler

PP-099

RELATION BETWEEN LOCATION AND PROVEN HISTOPATHOLOGICAL DIAGNOSIS IN SPINAL TUMORS: RETROSPECTIVE RADIOLOGICAL-PATHOLOGICAL STUDY

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OBJECTIVE and BACKGROUND: Preliminary diagnosis using magnetic resonance imaging (MRI) can help to plan surgical intervention and to reduce complications that may occur from surgery. Preoperatively performed MRIs are essential before treating spinal tumors surgically. In this study relation between histopathological proven diagnosis 96 spinal tumors and their affected spinal region have been investigated.

METHODS: Medical records were retrospectively reviewed for all spinal tumors operated at Department of Neurosurgery - BRSHH institution during a period of 6 years. 110 spinal tumors were detected. 14 tumors had not appropriate our study criteria (becuase of lost follow-up patient, the preoperative MRI did not perform or had unproven biopsy). Remaning 96 patients with spinal tumors were retrospectively investigated to understand the relation between involved spine region and tumor histopathological diagnosis.

RESULTS: 96 cases of spinal tumors were detected in 46 women “47.9%”and 50 “52.1%”men patients. The mean age was 49.3±22.7 (16-87) years. The most common symptoms were radicular pain (upper/lower extremities pain) (88.6%) followed by motor deficits (87.5%), loss of sensation (75.0%), lower motor neuron findings including changing in reflexes (57.3%), and urinary incontinence (35.4%), respectively. Histopathological diagnosis were metastasis in 26 cases, meningioma in 16, schwannoma in 15, ependymoma in 9, astrocytoma in 6, chronic granulomatosis infection in 4, lymphoma in 3, lipoma in 3, infection in 3 cases, and others in 11 cases. Locations of metastasis were 14 in lumbar 9 in thoracic and 3 in cervical spine. According this cervical spine was the less spinal region affected with metastasis ($p < 0.05$). Locatıons for Meningioma were 14 in thoracic and 2 cases in cervical. Thoracic spine was the most affected spinal region from meningioma ($p < 0.05$). Preoperatively preliminary diagnosis on MRIs were supported with histopathological examinations in 23 of 26 metastasis cases, 14 of 16 meningioma cases, 11 of 15 schwannoma cases, and all lipoma cases (n=3). Despite the fact that MRI can not diagnosis all cases of these tumors, but MRIs had a high accurate rate ($p < 0.05$).

DISCUSSION and CONCLUSION: According to our results metastasis rarely occurred in cervical spine while meningiomas were most likely to occur in thoracic spine. MRIs can help to diagnosis metastasis and benign spinal tumors while MRIs failed to distiguished glial tumors such as ependymomas and astrocytomas. Further prospective studies with large size are needed to support our results.

Keywords: MRI, metastasis, meningioma, schwannoma, epandymoma, histopathological diagnosis

Poster Bildiriler

PP-100

LUMBAR SYNOVIAL CYST

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INTRODUCTION: Synovial cysts are cystic enlargements of the synovial sheath. These cysts usually occur in peripheral joints and rarely in the facet joint synovia. Facet joint synovial cysts usually manifest themselves in the lumbar region of the vertebra. L4 and L5 level is a common location for synovial cysts. Symptoms such as Cauda Equina syndrome or sciatalgia can be seen in patients with Lumbar synovial cysts.

CASE: 54-year-old female patient presenting with pain in the lower back and right leg for 6 months. 6 months ago when the patient presented initially, no lesion was detected on MRI. Increasing pain in the last two months led the patient to use walking crutches for mobilization. MRI on T2 weighted image showed hyperintensity on right L4-L5 facet joint. An extradural extramedullary cystic lesion was detected neighboring the hyperintense region on right L4-L5 facet joint. Right L4 hemipartiallaminecthomy and total cyst excision was performed.

DISCUSSION: Symptomatic radiculopathy caused by lumbar intraspinal synovial cyst was discussed by Kao et al. who was also the first to use the term “juxtafacet cyst”. Juxtafacet cysts include intraspinal synovial and ganglion cysts. Synovial cysts are periarticular cysts of the synovial membrane. On the other hand, ganglion cysts lack a synovial cell lining and occur due to cystic softening and myxoid degeneration of the joint capsule. Nowadays the term “intraspinal synovial cyst” is being used instead of “juxtafacet cyst”. Lumbar intraspinal synovial cysts are most often seen in people in their 6th and 7th decades, especially in women. Intraspinal synovial cysts are reported between 0,01-0.8 percent of the patients who had lumbar spinal surgery. Post-traumatic bleeding and disc damage have been proposed as etiology for intraspinal cysts, however, arthritic changes in the facet joint play a major role in etiology.

Keywords: Lumbar synovial cysts, Spinal tumor, Conservative treatment, Surgical treatment, Radiculopathy

Poster Bildiriler

PP-101

PLASMACYTOMA CAUSING PATHOLOGICAL COLLAPSE IN L2 VERTEBRA: A CASE REPORT

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OBJECTIVE: Plasmocytomes are among the plasma cell malignancies and a term that describes the condition where multiple myeloma pathology occurs outside the bone marrow. Plasmocytomes can be seen as local or diffuse distant forms. We present a rare case of plasmacytoma which causes pathological collapse fracture in the lumbar region.

MATERIAL-METHODS: A 47-year-old female patient admitted to our outpatient clinic with low back pain, hip pain and difficulty in walking. Lumbar MR and CT revealed a pathological collapse fracture at the L2 level which resulted in loss of 80% of the vertebral height. He didn't describe a trauma in his anamnesis.

RESULTS: The patient was planned for surgery. L2 vertebrae total corpectomy was performed with lumbar anteralateral approach with urology and cardiovascular surgeon. Lift mesh cage placed. In the same session, the patient was placed in the prone position and fusion was performed with L1-L3 posterior stabilization. The patient was followed-up in our clinic for 1 week and was discharged from the hospital without any neurological deficit. The patient was referred to the Oncology outpatient clinic.

DISCUSSION and CONCLUSION: Plasmocytomas are rarely seen in the etiology of lumbar region pathological collapse fractures. Anterolateral approach, corpectomy and posterior transpedicular fusion result in satisfactory outcome in surgical planning.

Keywords: Plascytocytoma, Lumbar, Crash Fracture

Poster Bildiriler

PP-102

COMPARISON OF SCREW MALPOSITION IN IDIOPATHIC AND DEGENERATIVE SCOLIOSIS SURGERY

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PURPOSE: Transpedincular screw fixation is the gold standard in spine stabilization. The rate of screw malposition is variable in the literature and it has been reported up to 20% especially in scoliosis surgery. Although the rate of malposition is decreased by the help of spinal navigation systems and devices like O-arm, the availability of these devices are low due to their cost. In this study, we evaluated the rate of screw malposition in patients who underwent scoliosis surgery by free hand technique.

PATIENTS and METHODS: The study population included idiopathic and degenerative scoliosis patients who underwent had postoperative computed tomography scanning. The age of the patient, postoperative Cobb angle and presence of screw malposition symptoms were noted. Screw malposition was evaluated if 25% of the diameter of the screw was outside the pedicle. All variables were evaluated as 2 groups in both degenerative and adolescent idiopathic scoliosis (AIS) to determine the etiology of screw malposition.

RESULTS: 32 patients were included in the study. 13 patients were operated for AIS while 19 patients were operated for degenerative scoliosis. The mean Cobb angle was 43.7 in AIS patients and 28.9 in degenerative scoliosis patients. The malposition was present in 35 of 246 screws in AIS group, and14 of 218 screws in degenerative group. There were medial pedicle perforation in 16 screws in AIS group and 6 in degenerative group.

CONCLUSION: Our findings showed that Cobb angle was correlated with the rate of screw malposition. However, there was not a significant relation between Cobb angle and malposition rate in AIS group. We determined that the rate of screw malposition was high in vertebrae with low cancellous bone in AIS patients.

Keywords: pedicle screw, malposition, scoliosis

Poster Bildiriler

PP-103

VERTEBROPLASTY IN PATIENTS WITH MULTIPLE MYELOMA HAVING VERTEBRAL INVOLVEMENT

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AIM: This study was designed to investigate the role of vertebroplasty on the pain management of the patients with multiple myeloma (MM) having vertebral involvement.

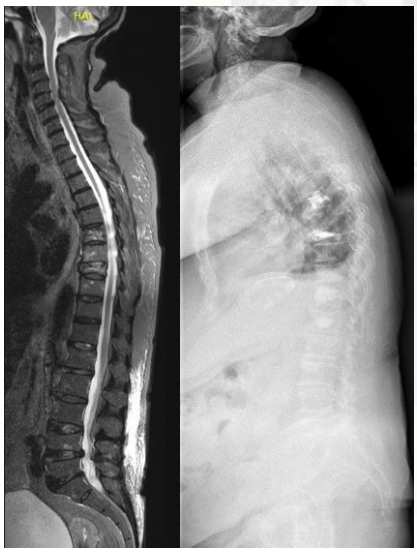
PATIENTS and METHODS: We reviewed 11 multiple myeloma patients with vertebral involvement and pain underwent percutaneous vertebroplasty. Vertebroplasty procedures performed on 62 vertebrae of 11 patients. All patients were operated under general anesthesia. Magnetic resonance imaging was performed before the procedure to assess vertebral involvement of multiple myeloma. The following variables were evaluated: affected vertebral levels, loss of vertebral body height, polymethylmethacrylate (PMMA) cement amount applied to the vertebral body during PV, PMMA cement leakages, and pain before and after percutaneous vertebroplasty as assessed by a visual analogue scale (VAS).

RESULTS: All patients were mobilized one day after the surgery and discharged. Median VAS scores of patients decreased from 9 one day before percutaneous vertebroplasty, to 5 one day after the surgery, to 2 one week after the surgery, and eventually to 1 three months after the procedure ($P < 0.001$). During the vertebroplasty procedure, cement leakage was observed at 12 vertebral levels (19%). The median value of PMMA applied to the vertebral body was 4 mL.

CONCLUSION: Being a minimally invasive and easily performed procedure with low complication rates, PV should be preferred for serious back pain of multiple myeloma patients.

Keywords: multiple myeloma, vertebroplasty, back pain

Figure 1



Preop MRI & Postop Xray

Poster Bildiriler

PP-104

COMPLICATIONS OF LATERAL MASS SCREW FIXATION WITHOUT İMAGE GUIDANCE

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Lateral mass (LM) screw fixation is a commonly used procedure for degenerative, inflammatory, infectious disorders, neoplasms and iatrogenic unstability of cervical spine or prevention of late time unstability.It has shown that Lateral mass (LM) screw fixation is much safer than the pedicle screw nevertheless there maybe potential complications such as; spinal cord injury, vertebral artery (VA) injury, nerve root injuries and facet violation (FV)

Thirty- eight patients with the diagnosis of cervical spondylotic myelopathy who underwent decompression and lateral mass screw fixation without image guidance were examined. The entry point of the screws was determined 2mm medial to the mid- point of the lateral mass. The angle of screw trajectory was directed approximately 30 ° laterally. The screw angle was measured on sagittal plane according to patient's position. After determination the sagittal angulation by dissector were placed parallel to the facet joint surface. For all patients, three dimensional computed tomographic (CT) examinations of cervical spine were performed after the surgery. Number of screw at every plane, foramen transversium, intervertebral foramen and facet joint violation had been checked

There were not any vertebral artery and spinal cord injury. Foramen transversium violation was observed if the lateral trajectory angulation had been performed insufficiently while the facet joint violation was observed if the sagittal angulation had been determined insufficiently. Lateral mass screw fixation without image guidance is a safe stabilization technique with the relative ease of placement and lower potential risk for violation of the VA foramen as well as FV during screw insertion.

Keywords: Cervical fixation,Freehand,Lateral mass screw

Poster Bildiriler

PP-105

DYNAMIC ROD SYSTEMS IN LUMBAR SPONDYLOSIS: CLINICAL SERIES

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Along with the aging population, more complicated cases of spondylosis are encountered. Simple decompression methods are resulted favorably in the cases which have decreased disc height and shows spontaneous fusion. However, it can lead to instability in cases, whose disc heights and segmental movements are preserved. The rigid stabilization methods which are developed so far, causes moving segment loss and additional pathologies such as adjacent segment degeneration. In this study; we present the results of the middle-term follow-up results of thirty patients who were treated with the dynamic rod system which was developed by us. The diagnosis of our patients is lumbar degenerative spondylosis. There is usually stenosis of the canal, showing ligament hypertrophy and disc degeneration. Disk heights did not decrease by more than ¾ of the height of the upper disc and patients with moving segments in dynamic radiographies were also included in the study. Pathological segments; were located between L3-S1. Single segment stabilization was performed with four screws. In our patients; neurological examination, VAS pain scale, disc height and angle of disc motion on dynamic radiographs were determined before and after the operation. The follow-up period ranged from 4 to 14 months with a mean value of 9 months. We had no complication such as instability, related to anesthesia, surgical application, and instrument failure. The mean value of preoperative VAS was 8,2 and it was decreased to 3,4 post-operatively which shows a meaningful difference according to applied statistical tests. In all segments, the mean range of motion was 4,5 degrees preoperatively and 4,7 degrees postoperatively. Moreover, the mean value of pathological disc height was detected as 19 mm initially, besides 18 mm post-operatively which has no meaningful difference statistically. Adjacent segment degeneration (on MRI) was not detected. Our findings show that dynamic systems are more effective because they prevent the instability while maintaining movement and disk height.

Keywords: Dynamic rod, Lumbar, Spodylosis

Poster Bildiriler

PP-106

EFFECTIVNESS OF COMBINED VAC AND HBO THERAPY IN THE TREATMENT OF SEVERE IATROJENIC SPINE INFECTIONS

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Spinal infections are among the most important complications of spine surgery, resulting in severe morbidities, increased hospital stay with economic consequences. Manengment of spine infections include debridment, culture, and antibiotherapy, with and without decompresion and stabilization. Antibiotherapy resistant spine infections are chalenching.

VAC and HBO thearphy are novel treatment modalities which are widely used in the treatment of infections by other medical disiplinces. In this study, results of combined VAC -HBO therapy combined with antibiotherapy in the treament of antibiotherapy- resistant spine infections (ARSI) are presanted

Keywords: Spine infections, Hiperbaric oxygen therapy, VAC

Poster Bildiriler

PP-107

CHIARI MALFORMATION AND MULTIPLE LEVEL CERVICAL DISC ASSOCIATION

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AIM: Chiari Malformation is a congenital hindbrain anomaly where the cerebellum and brain stem are displaced to the cervical spinal canal. Chiari Malformation and cervical disc herniation have become more common with the more widespread and frequent use of diagnostic tests. The treatment and follow-up criteria of the patient with cervical disc herniation causing pain were discussed.

METHOD: Case Ç.E. is a 30-year-old female patient. The patient was admitted to our clinic for the last 2 years with complaints of right arm pain which increased in the last 1 month. The patient was diagnosed with multiple cervical disc herniation (C3-4, C4-5). Needle EMG to the patient is normal; Somatosensory UP (SEP) was interpreted in favor of the posterior cord conduction in the left symptomatically. Chiari type 1 malformation was thought to be in the foreground and the patient was taken into operation. In the operation, suboccipital craniectomy and C 1 posterior arch excision and fibrotic bands on the dura were opened.

RESULTS: The post-operative right radicular pain was relieved.

CONCLUSION: Chiari Malformation and cervical disc herniation show similar clinical symptoms such as neck pain, arm pain and numbness and may be associated with the present case. Surgical procedures for Chiari Malformation and relieving CSF circulation may improve radicular pain or sensory deficits.This may be interpreted as responsible for Chiari Malformation in this case rather than radicular symptoms.

Keywords: Chiari Malformation, Cervical disc herniation, Somatosensoryel UP(SEP)

Poster Bildiriler

PP-108

AGGRESSIVE HEMANGIOMA

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We presented a 53 years old male suffering from back pain and motor weakness in his lower extremities for 1 month. Thoracic vertebra MRI, revealed an aggressive hemangioma in T8 vertebral body. In this case, there are few treatment options, such as posterior decompression-fixation surgery, posterior decompression-fixation surgery following embolization, radiation therapy, percutaneous vertebroplasty, While treating this aggressive hemangioma, we preferred to combine 2 different techniques; cement injection into T8 vertebral body and posterior decompression-fixation surgery (T8 total laminectomy, posterior stabilization with T6-7, T9-10 bilateral transpedicular screws-rod system). Cement injection caused necrosis which eventually prevented hemorrhage during the bony decompression. Posterior fixation was utilized in order to avoid possible further kyphosis due to iatrogenic destruction of posterior tension band during decompression (T8 total laminectomy) procedure.

Keywords: Aggressive Hemangioma, Cement, Stabilization

Poster Bildiriler

PP-109

RECURRENT EPIDURAL HYDATID CYST OF SPINE: A CASE REPORT AND LITERATURE REVIEW

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Hydatid cyst infestation is one of the oldest disease in the literature. Hydatid cysts of the spine (HS) is a rare form of this parasitic infection, cause of high morbidity and mortality.. The vertebral column in 0.2–1% of all patients of which spine is involved in approximately 45% of case. Clinical presentation may occur atypical focal neurological signs.The diagnosis and treatment are often difficult and HS can be relaps many times. ın this study, we want to present a case of pathologically confirmed primary intradural and extradural spinal hydatid cyst with spinal cord compression with iteratue review.

CASE: A 29 years old young lady presented to us with a sudden onset of weakness in both her lower limbs since 7 days.On presentation the motor exam was right lower extremities 2/5, left lower extremities 0/5 reflexes were hyperactive with bilateral Babinski responses, and she had a relative T9 pin level with loss of vibration appreciation in the lower extremities. She had been undergone surge 2 times in over 3 years for recurrent hydatid cyst infestation. Magnetic resonance imaging (MRI) demonstrated an extradural and extra spinal fluid filled multi loculeted mass with involvement of the body, pedicle and posterior arch of thoracal vertebras with a possible diagnosis of recurrent spinal hydatidosis (hypointense on T1-WI and brightly hyperintense on T2-WI). The thoraco-abdominal CT scans were negative as were routine laboratory studies.

DISCUSSION: The spine is the most common location of bone hydatidosis.Surgical debridement is the main stay of treatment, but this usually palliative rather than curative.Decompression combined with a unique isotonic saline irrigation-aspiration technique may successfully remove/decompress multilevel spinal epidural hydatid cysts.

CONCLUSION: Surgical decompression and stabilization, combined with adjuvant chemotherapy, is the treatment of choice.

Keywords: Albendazol, Echinococcus Granulosus, Hydatid cyst, Sur

Poster Bildiriler

PP-110

EFFECT OF PULSED RADIOFREQUENCY TREATMENT ON THE THORACIC MEDIAL BRANCH FOR MANAGING THORACIC FACET JOINT PAIN

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INTRODUCTION: The prevalence of thoracic pain is approximately 15%. One of the most common causes of this pain is thoracic facet joint, affecting 34%-48% of patients. The facet joints are innervated by medial branches of the dorsal rami from the spinal nerves and radiofrequency neurolysis of the thoracic medial branch under fluoroscopy guidance has been used to manage TFJ pain. In this case series, the effect and clinical results of pulse RF stimulation of the thoracic medial branch under ultrasound guidance was investigated.

METHOD: Fifteen patients received medial branch PRF under ultrasound guidance. The patients were laid in prone position and iv sedated. Target facets were identified using the most inferior rib as a starting point and scanning medially toward its axial attachment and further medially and slightly superior over the most caudal thoracic facet (T11-12). Subsequent facet joints were identified by simply moving the transducer superiorly in the sagittal plain until the next cephaled facet was encountered. After identification, 22 gauge RF needle was inserted through the lamina in in-plain approach with continuous visualization. PRF treatment was administered for 360 seconds after negative sensorial and motor tests. The pain-reducing effect of the PRF procedure was evaluated via the NRS at 1, and 2. months after treatment. Successful pain relief was defined as ≥50% reduction in the NRS score. Analgesic consumption and procedural complications were also identified and all data were analyzed retrospectively.

RESULTS: The procedures were performed successfully in all patients. At 1 and 2. months after the procedure, the NRS scores were significantly reduced compared with the scores before the treatment ($p<0.05$, $p<0.05$, retrospectively). Analgesic consumption was significantly reduced in all patients and sensorial and neurologic complications were not observed in any of the patients.

DISCUSSION: PRF on the thoracic medial branch is an effective and safe interventional technique for the control of chronic TFJ pain.

Keywords: Thoracic Medial Branch, Thoracic Facet Joint Pain, Pulsed Radiofrequency

Poster Bildiriler

PP-111

THORACOSCOPIC VERTEBRAL BODY TETHERING FOR ADOLESCENT IDIOPATHIC SCOLIOSIS: MINIMUM 2 YEARS RESULTS OF PATIENTS REACHING SKELETAL MATURITY

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PURPOSE: Growth modulation with VBT has been reported to be safe and effective. This is the first report with ≥2 years' f-up, in which all patients reached skeletal maturity.

MATERIAL-METHODS: Data were collected preoperatively, before discharge, and at each follow-up. Demographic, perioperative, clinical, radiographic data and complications were recorded. Respiratory function tests were done at preop and 1 year postop. Surgical and total f-up correction percentages were calculated. Descriptive statistics are given.

RESULTS: 14 Lenke 1 patients (14F, 12.3±0.9 years) with a mean follow-up of 28.9 (24-54) months were included. Preoperatively, all but 2 pts were premenarchal (median Sanders: 3 (2-5), median Risser: 0 (0-3)). The mean preoperative main thoracic (MT) curve was 45.4° (36-59°). Mean preoperative upper thoracic (UT) and lumbar (L) curves were 27.5°(14-44°) and 32.3° (22-42°), respectively. A mean of 7.3 (7-9) levels were tethered (UIV: T5/T6, LIV: T11/T12/L1). Mean surgical time was 233±71 min. Mean EBL was 55±41 ml. Mean initial correction rates were 34%, 54% and 49% for UT, MT and L curves, respectively. Following initial gain in height, patients grew 6.4 (2- 16) cm on average, where 7 (-5 to 15) mm was between UIV-LIV. This growth was reflected into spontaneous f-up correction. Last f-up correction rates were 44%, 78% and 83% for UT, MT and L curves, respectively. Preop mean hump of 12° was reduced to 5.4° at final f-up. No significant changes were noted in kyphosis and lordosis measurements. Mean forced vital capacity increased from 2350 to 2858 ml at 1 year (range of change, 20-1220ml). All patients reached skeletal maturity (Sanders 7). Pulmonary complications (14%) were 1 atelectasis that resolved with physical therapy, and 1 pulmonary effusion that required readmission (7%). Mechanical complications were 2 overcorrection (14%) one of which was accompanied by LIV screw loosening. No tether breakages were observed.

CONCLUSIONS: VBT enabled spontaneous correction while allowing growth.Spontaneous corrections in the non-operated upper thoracic and lumbar levels were also noted. All overcorrections were observed in Sanders 2 patients. Sanders 3-5 patients possess a lesser risk of mechanical complications. VBT resulted in improved pulmonary functions. Overall pulmonary and mechanical complications rates were 14% each.

Keywords: VBT, AIS, complications

Poster Bildiriler

PP-112

SUCCESSFUL CREATION OF DEPLOYABLE PREOPERATIVE PREDICTIVE RISK CALCULATORS FOR INDIVIDUAL PATIENT EVENT-FREE SURVIVORSHIP FOR MAJOR COMPLICATIONS, HOSPITAL READMISSIONS AND UNPLANNED SURGERY FOLLOWING ADULT SPINAL DEFORMITY SURGERY

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PURPOSE: Few predictive models allow for proper preoperative patient selection, adjustment of invasiveness and patient frailty optimization to predict and reduce postoperative Major complications (MC), hospital readmissions (READMIT) and Unplanned reoperation (UNPLAN). This was a Retrospective analysis of two independent prospective, multi-center adult spinal deformity databases with identical fixed data fields.

MATERIAL-METHODS: Surgically treated adult spinal deformity patients with >2 year follow-up were identified. Patient demographic, radiographic, operative, baseline patient-reported outcome measures (PROMs), and complications data were analyzed to build event free survival curves for MC, READMIT and UNPLAN, and to create predictive models by means of a random survival forest with 80/20 train/test sets. A total of 101 variables were used to train the models. Goodness of fit was assessed in the test set. Missing value imputation was performed with the miss-Forest package. R software was used for analysis (Vienna 2016).

RESULTS: 1,408 ASD patients operated before Dec-2015 (76.2% women, 55.6 mean age, 10.53 mean nº of fused segments, 54.4% pelvic fixation, 21.2% 3CO) by 57 surgeons at 24 sites in 5 countries (2 continents), with 2,047.97 observation-years, were included in the analysis. Missing value imputation out of the box error rate was 14.59%. C-statistic value (70.56% in the sample test) proved successful model fit. Models demonstrate that 87.9% of patients are MC-free at 10 days postop, 78,5% at 90 days and 63% at 2-years. Surgical invasiveness (LIV-pelvic fixation, length of fusion, prior surgery), age, magnitude of sagittal deformity, patient frailty (walking tolerance, lifting capacity) and operative blood loss most strongly predict MC. Surgeon and site most strongly predict READMIT and UNPLAN. Curves show a continued survivorship decrease for event free MC, READMIT and UNPLAN beyond 2y FUp.

CONCLUSIONS: Risk calculating models for event free MC, READMIT and UNPLAN following adult spinal deformity surgery demonstrate that patient-related factors, >1/3 of which are modifiable, account for 55% of the MC predictive model weight. Surgeon and site represent 4% for MC, but are most relevant for READMIT and UNPLAN.

Keywords: major complication, readmission, reoperation, adult spinal deformity

Poster Bildiriler

PP-113

DEVELOPMENT OF DEPLOYABLE PREDICTIVE MODELS FOR MCID OF 2 YEAR OUTCOMES ACROSS ALL COMMONLY USED HRQOL INSTRUMENTS IN ADULT SPINAL DEFORMITY SURGERY: RESULTS IN 570 PATIENTS FROM 17 HOSPITALS

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PURPOSE: Adult spinal deformity surgery is costly with variable outcomes; in some series only 50% of patients achieve MCID improvements. Predictive modeling may be useful in shared-decision making and surgical planning. The objective of this study was to model health-related quality of life (HRQOL) overall improvement, including the likelihood of achieving clinically important improvement, at 2 years postoperatively.

MATERIAL-METHODS: Two prospective observational cohorts were queried for Adult spinal deformity patients with SRS-22 / ODI / SF-36v2 data at baseline, 1 year and 2 years after surgery. 75 variables were used in the training of the models including demographic data, enrollment HRQOL, and modifiable surgical data. 8 different prediction algorithms were trained with 3-time horizons: baseline to 1-yr, baseline to 2-yr and 1-yr to 2-yr. External validation was accomplished via an 80/20 data split for training and testing each model, respectively. 5-Fold cross validation within the training sample was performed. Accuracy was measured as the mean average error (MAE; smaller is better) and R^2 values.

RESULTS: 570 patients were included in the analysis. Models with the lowest MAE for each of the 5-time points were selected; ultimately the model had 82.4% predictive power. Patients with lower enrollment HRQOL were likely to achieve the greatest improvements. Addition of surgeon and site to preoperative data increased the predictive power 1.8%. Site and surgeon fixed-effects played a crucial role in explaining outcome variance.

CONCLUSIONS: We present an accurate and consistent way of predicting outcome scores for ASD surgery in the largest-to-date prospective operative multicenter cohort with 2-year follow-up. This study has significant clinical implications for shared-decision making, surgical planning and postoperative counseling. Surgeon and site were important components of the model, explaining variance in predicted 2-yr HRQOL.

Keywords: Adult Spinal Deformity, HRQOL,MCID

Poster Bildiriler

PP-114

EFFECTS OF RESTORING INDIVIDUALIZED SAGITTAL SHAPE AND ALIGNMENT ON MECHANICAL COMPLICATIONS AND PATIENT-REPORTED OUTCOMES IN ELDERLY PATIENTS FUSED TO PELVIS

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PURPOSE: Sagittal plane has been associated with Patient-Reported Outcome Measures (PROMs) and mechanical complications in adult spinal deformity patients. The aim was to compare mechanical complication rates and PROMs of elderly patients fused from lower thoracic to sacroiliac spine that reached different individualized sagittal shape and alignment.

MATERIAL-METHODS: Inclusion criteria: ≥60 years, ≥2years follow-up, UIV to be between T8-L1, and LIV to be S1-S2 or ilium. Mechanical complications: PJK/PJF, rod breakage and implant-related complications. The Global Alignment and Proportion (GAP) score was used to postoperatively divide patients into 3 groups: Proportioned (GAP-P), Moderately Disproportioned (GAP-MD) and Severely Disproportioned (GAP-SD). Mechanical complication rates were compared using Chi-squared tests. Pearson's partial correlation and Two-Way Mixed ANCOVA was performed to determine the relationship between the change in the sagittal plane (assessed by pre- and post-op GAP score) and change in PROMs (pre-op, 6m and 1 yr).

RESULTS: 120 patients (100F, 20M) were included. Mean age: 69.6±5.7 years. Mean follow-up: 30.8±5.7(24-62) months. Mechanical complication rates were 5.9% in GAP-P, 53.2% in GAP-MD and 85.7% in GAP-SD groups. Details are given in fig 1a. All groups had significant improvement in PROMs at 6 months regardless of the amount of correction in the sagittal plane ($p>0.05$), while PROMs at 1 year was associated with the GAP Score ($r=0.332$, $p<0.01$ for COMI, $r=0.268$, $p<0.05$ for ODI and $r=-0.245$, $p<0.05$ for SRS22-subtotal). The improvement in PROMs was significantly related to GAP categories (Fig 1b).

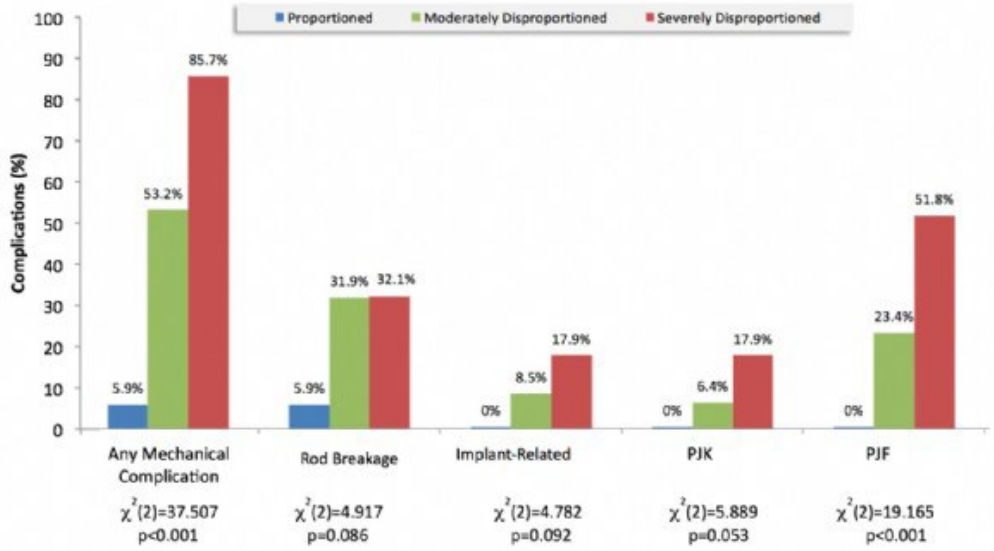
CONCLUSIONS: PROMs of all elderly patients fused to sacroiliac spine were improved in early follow-up regardless of their sagittal plane restoration. However; only GAP-P patients reported sustainable improvement, while GAP-MD and GAP-SD were stable or worsened. Mechanical complication rates were lower when sagittal plane was restored to the individualized ideal.

Keywords: Sagittal Plane, Adult Spinal Deformity, Mechanical Complications

Poster Bildiriler

T10-pelvis

A



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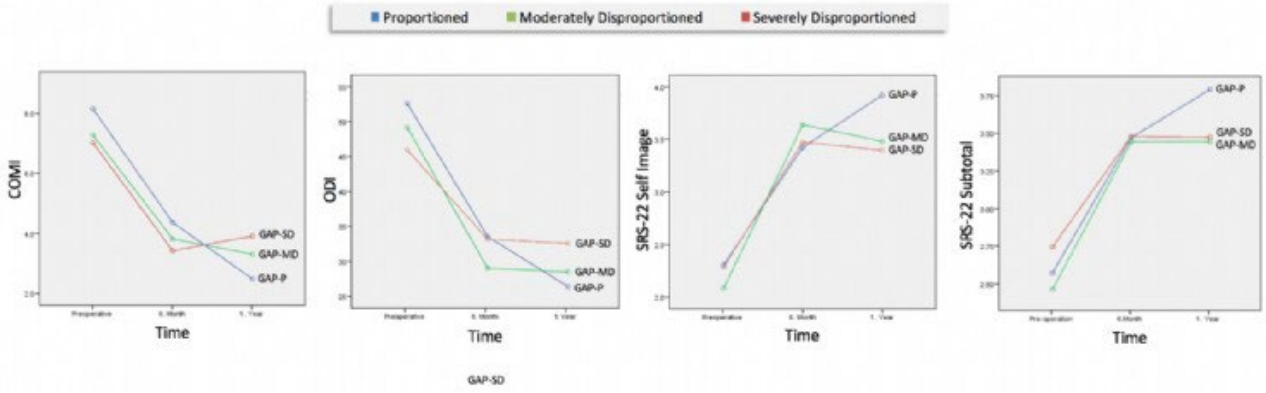

Poster Bildiriler

PP-115

FROM PREDICTION TO PREVENTION IN ASSESSMENT OF RISK OF MECHANICAL COMPLICATIONS

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PURPOSE: The multifactorial etiology of adult spinal deformity and high rate of mechanical complications suggests more careful patient selection and surgical planning is required. K-means clustering is a simple unsupervised machine-learning algorithm that enables aggregation of patients into groups based on certain similarities. Although clustering can predetermine low-risk patients (healthier) vs high-risk patients (more sick), the surgical result (with implications for surgical planning) can also affect mechanical complication rates.

MATERIAL-METHODS: The data from 457 patients (362F, 95M, 53±19 yrs) with ≥4-level fusion and a mean follow-up of 39.3 (24-94) months were included. After removing highly correlated variables (r >0.7 for Pearson correlation), the data were reduced to two principle components. K-Means clustering was performed with K=2. The mechanical complication rate was assessed in the two clusters. After this, clusters were further divided based on the three GAP categories (indicates individualized spinopelvic alignment). Mechanical complication rates were assessed in the subgroups within each cluster.

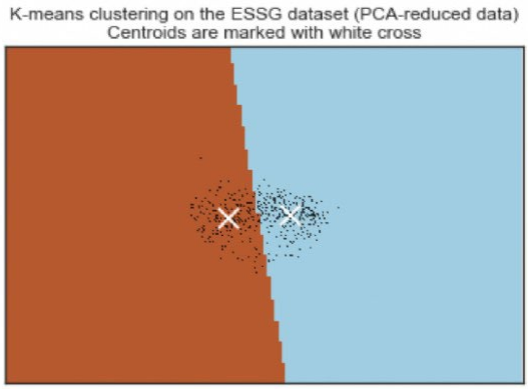
RESULTS: 2 main clusters were identified based on 62 preoperative variables representing clinical history, demographic, comorbidity, radiographic, and PROM data. Mechanical complication rates were different between the 2 main clusters (23.8% vs 57.8%; p<0.001), and also within the three GAP categories for each cluster: respectively, 8.3% vs 33.9% vs 76.2% for GAP-P, GAP-MD and GAP-SD in cluster 1, and 18.2% vs 63.4% vs 77.1% in cluster 2 (p<0.001).

CONCLUSIONS: Cluster analysis of data from an adult spinal deformity (ASD) database, including 457 patients with ≥2 years' follow-up after surgery and a 43.8% complication rate, showed different clusters for risk of mechanical complications based on "patient" characteristics. Even in cases associated with greater risk based on preoperative factors (i.e 57.8% for cluster 2 patients), achievement of a proportioned spine was associated with lower risk (i.e 18.2% in GAP-P patients in the same cluster). The difference in the complication rates for a given GAP in the different clusters suggests that although the alignment goals should be the same, healthier patients better tolerate deviations (especially those of a moderate degree) than do sicker patients. Both patient selection and surgical planning are important in managing complications, with the latter being more prominent.

Keywords: machine learning, adult spinal deformity, clustering

Poster Bildiriler

dichotomized



% of Mechanical Complications			
23.8		57.8	
GAP-P	8.3	GAP-P	18.2
GAP-MD	33.9	GAP-MD	63.4
GAP-SD	76.2	GAP-SD	77.1

Poster Bildiriler

PP-116

SURGICAL TREATMENT OF SPONDYLOLYSIS IN YOUNG ADULTS: U-SHAPED TITANIUM ROD-SCREW FIXATION COMBINED WITH AUTOGRAFTING. A RETROSPECTIVE REVIEW OF 14 PATIENTS

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INTRODUCTION: Spondylolysis is described as the uni- or bilateral defect of pars interarticularis. While for adolescents, conservative methods were reported as the mainstay of treatment, surgical treatment has been advised for those with persistent pain and impairment despite conservative treatment.Many surgical techniques with varying degrees of success were described in the literature including Kimura's fixation without instrumentation,Buck's technique including screw fixation through the defect,Scott's wiring technique and various screw-hook and screw-cable interlaminar fixation techniques.The aim of this study is to present our clinical and radiographic mid-term results with u-shaped titanium rod-screw fixation (USTRSF) with autografting in adolescent patients with spondylolysis.

PATIENTS and METHODS: 14 adolescent patients with a diagnosis of spondylolysis who were treated with two polyaxial pedicle screws and a titanium u-shaped rod placed beneath the spinous process between 2013 - 2016 were retrospectively reviewed and included in the study.

RESULTS: 14 patients with a mean age of 17.2 and mean duration of follow-up of 51 months were included in the study.All the patients were diagnosed to have spondylolysis at the level of L5, while 5 patients were also noted to have scoliotic deformities.All patients underwent USTRSF with the curettage and lavage of the pseudoarthrotic area and placement of autografts taken from iliac wings.Scoliotic deformities of 3 patients were corrected with posterior fusion combined with USTRSF,while the rest were planned for regular follow-up. Patients had a mean pre-operative/and at the last follow-up VAS score of 8.1/1.4, ODI score of 30.4/3.1, total SRS-22 score of 2.2/4.7 ($p<0.001$).A complete radiographic healing as a result of the CT scan taken at the 3rd post-operative month and total pain relief were detected in all but one patient who underwent implant removal after solid fusion and became pain-free.Patients were able to return to daily activities immediately after the surgery.6 professional athletes were able to return to sports at the same pre-operative level at the 6th post-operative month.

DISCUSSION AND CONCLUSION: Treatment of symptomatic spondylolysis in adolescents is still a challenge for spine surgeons. While fusion should be avoided in adolescents to protect the mobile segments and prevent from adjacent segment degeneration, USTRSF with autografting was shown to be a safe and effective method with high rates of union, ease and safety on application and the ability to protect the adjacent segments while allowing immediate post-operative mobilization and even return to sports at the same pre-operative level at the 6th post-operative month in professional athletes.

Keywords: Spondylolysis, U-shaped titanium rod screw fixation, defect of pars interarticularis, polyaxial pedicle screws, protection of adjacent segments

Poster Bildiriler

PP-117

SPINAL FUSION IN FACIOSCAPULOHUMERAL DYSTROPHY FOR HYPERLORDOSIS: A CASE REPORT

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PURPOSE: Facioscapulohumeral muscular dystrophy (FSHD) is the third most common muscular dystrophy, which is associated with facial, shoulder girdle and paraspinal muscle atrophy. Most of the patients develop hypokyphosis and hyperlordosis in the course of the disease, to preserve standing posture. Corrective fusion is contraindicated in these patients as the surgery results with loss of compensatory hyperlordosis and leads to loss of trunk balance while standing. Although spinal fusion in neuromuscular scoliosis is a known treatment option, there are no studies in the literature on spinal fusion of this specific patient group. In this case report, we have presented a case with severe hyperlordosis causing intra-abdominal disorders, radicular symptoms and sitting discomfort. Purpose of this case report is to present a case of successful spinal fusion in a facioscapulohumeral muscular dystrophy patient for hyperlordosis and to objectively report the increase in her quality of life.

METHODS: Individualized Neuromuscular Quality of Life Questionnaire (INQoL) was used to quantify and compare the preoperative and third year postoperative quality of life of the patient.

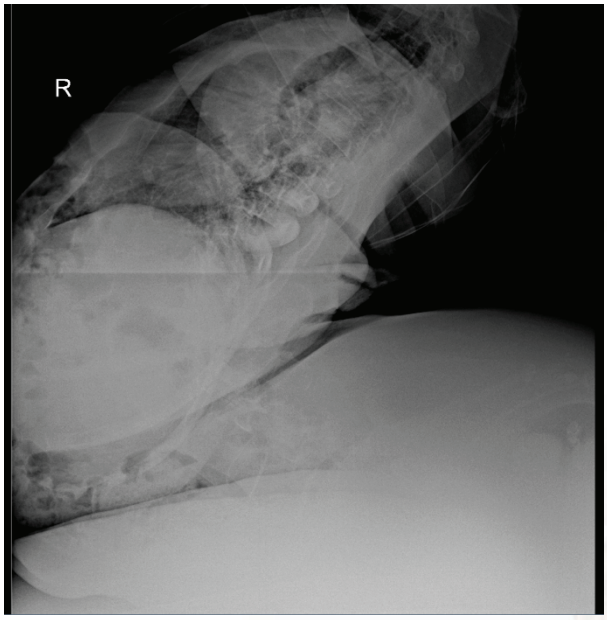
FINDINGS: Patient underwent T2 - S1 fusion and successful fusion was achieved. Individualized Neuromuscular Quality of Life Questionnaire (INQoL) was used to assess preoperative and 3 years postoperative functional outcome. All domains and total score improved at the end of the follow-up period and successful fusion was verified radiologically.

CONCLUSION: This case suggests that spinal fusion may provide functional improvement in carefully selected patient groups. Patient stratification considering spinal disability is required for further studies in this specific indication.

Keywords: Facioscapulohumeral muscular dystrophy, hyperlordosis, muscular dystrophy, quality of life, spinal fusion

Poster Bildiriler

Preoperative Lateral Abdomen X-Ray



Subdomain and subscale score distribution of Individualized Neuromuscular Quality of Life" (INQoL) score.

	Subscales	Preoperative Score	Postoperative Score
Symptoms Domain	I - Weakness	100	94.74
	II - Pain	94.74	0
	III - Fatigue	94.74	52.63
	IV - Muscle Locking	0	0
	V - Droopy Eyelids	47.37	0
	VI - Double Vision	0	0
	VII - Swallowing Difficulties	63.16	0
Life Domain	I - Activities	76.85	57.41
	II - Independence	97.22	100
	III - Social Relationship	44.44	0
	IV - Emotions	19.44	0
	V - Body Image	88.88	61.11
Treatment		83.33 (Expected)	100 (Perceived)
Quality of Life		55.55	40

Lower scores indicate better clinical impact for all domains and subscales, except treatment domain where higher score indicates better clinical impact.

Poster Bildiriler

PP-118

THE COMPARISON OF CORRECTION IN COBB ANGLES WITH SRS-22 SURVEY VALUES IN ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS WITH POSTERIOR INSTRUMENTATION AND FUSION

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OBJECTIVE: The aim of posterior instrumentation and fusion in patients with adolescent idiopathic scoliosis (AIS) is to significantly enhance both physical and life quality scores. SRS-22 survey which was reported by Scoliosis Research Society, had excellent inter- and intraobserver realibility in patients with AIS. The objective of the current study was to compare correction rates in Cobb angles with SRS-22 survey values in AIS patients with posterior instrumentation and fusion.

METHODS: Between January 2007 and December 2013, 30 AIS patients with posterior instrumentation and fusion were grouped according to the correction values in Cobb angles postoperatively. 80% or more correction was defined as (Group 1), between 60% and 80% correction was defined as (Group 2) and less than 60% correction was defined as (Group 3). SRS-22 survey values were recorded preoperatively and at postoperative 2 years. Kolmogorov-Smirnow and Shapiro-Wilk tests were used to evaluate the relevance of values to normal distribution. Kruskal-Wallis test was used to compare intergroup values that did not show normal distribution.

RESULTS: No significant difference was observed among 3 groups in terms of physical perception, functional capacity, pain, emotional status, and total SRS-22 survey values ($p>0.005$,for all).

CONCLUSION: The amount of correction in Cobb angles has no effect on SRS-22 survey values in AIS patients with posterior instrumentation and fusion.

Keywords: Scoliosis, instrumentation, fusion

Poster Bildiriler

The comparison of SRS-22 survey values and groups

	Grup A (n=12)	Grup B (n=9)	Grup C (n=9)	P*	Fark
Yaş	16,2 ± 2,8	16 (13 - 21) 16,4 ± 2,6	16 (13 - 21) 14,6 ± 1,7	15 (11 - 17) 0,256 --	
Seviye	11,2 ± 1,3	11 (9 - 13) 11,7 ± 1,2	12 (10 - 14) 12,1 ± 1,2	12 (10 - 14) 0,244 --	
Lenke	32,2 ± 17,7	33 (11 - 53) 23,1 ± 17,9	12 (11 - 53) 29,9 ± 18,9	30 (12 - 53) 0,556 --	
Cobb Preop	42,8 ± 3,3	42 (40 - 50) 43,2 ± 3,2	43 (40 - 48) 45,7 ± 6,0	45 (40 - 56) 0,499 --	
	12 7,9 ± 4,7	6 (3 - 20) 11,6 ± 3,2	12 (5 - 16) 23,1 ± 7,6	26 (10 - 32) 0,000	A ile C P** 0,002 0,008 0,008
Koreksiyon Oranı	85,5 ± 4,9	85 (80 - 96) 70,5 ± 3,7	71 (63 - 75) 46,6 ± 7,4	48 (33 - 58) 0,000	A-B-C
Ağrı Preop	2,8 ± 0,7	3 (2 - 4) 3,3 ± 0,5	3 (2 - 4) 3,2 ± 0,8	4 (2 - 4) 0,152 --	
Postop	4,1 ± 0,5	4 (3 - 5) 4,4 ± 0,3	4 (4 - 5) 4,2 ± 0,8	4 (3 - 5) 0,338 --	
Değişim %'si	48,8 ± 25,2	43 (22 - 90) 35,2 ± 20,2	28 (20 - 84) 33,0 ± 14,0	32 (22 - 67) 0,189 --	P** 0,002 0,007 0,007
Görünüm Preop	2,8 ± 0,4	3 (2 - 3) 2,8 ± 0,4	3 (2 - 3) 2,8 ± 0,4	3 (2 - 3) 0,822 --	
Postop	4,0 ± 0,5	4 (3 - 5) 4,1 ± 0,5	4 (3 - 5) 3,8 ± 0,4	4 (3 - 4) 0,355 --	
Değişim %'si	47,5 ± 21,4	43 (25 - 77) 46,6 ± 18,0	43 (20 - 73) 40,2 ± 10,0	40 (25 - 55) 0,718 --	P** 0,002 0,007 0,007
Fonksiyon Preop	3,4 ± 0,7	3 (2 - 4) 3,8 ± 0,5	4 (3 - 4) 3,6 ± 0,6	4 (3 - 4) 0,271 --	
Postop	4,3 ± 0,5	5 (3 - 5) 4,6 ± 0,4	5 (4 - 5) 4,5 ± 0,5	5 (4 - 5) 0,471 --	
Değişim %'si 3	1,0 ± 21,3	29 (6 - 64) 21,5 ± 14,8	14 (5 - 44) 27,6 ± 14,6	28 (10 - 57) 0,420 --	P** 0,002 0,007 0,008

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