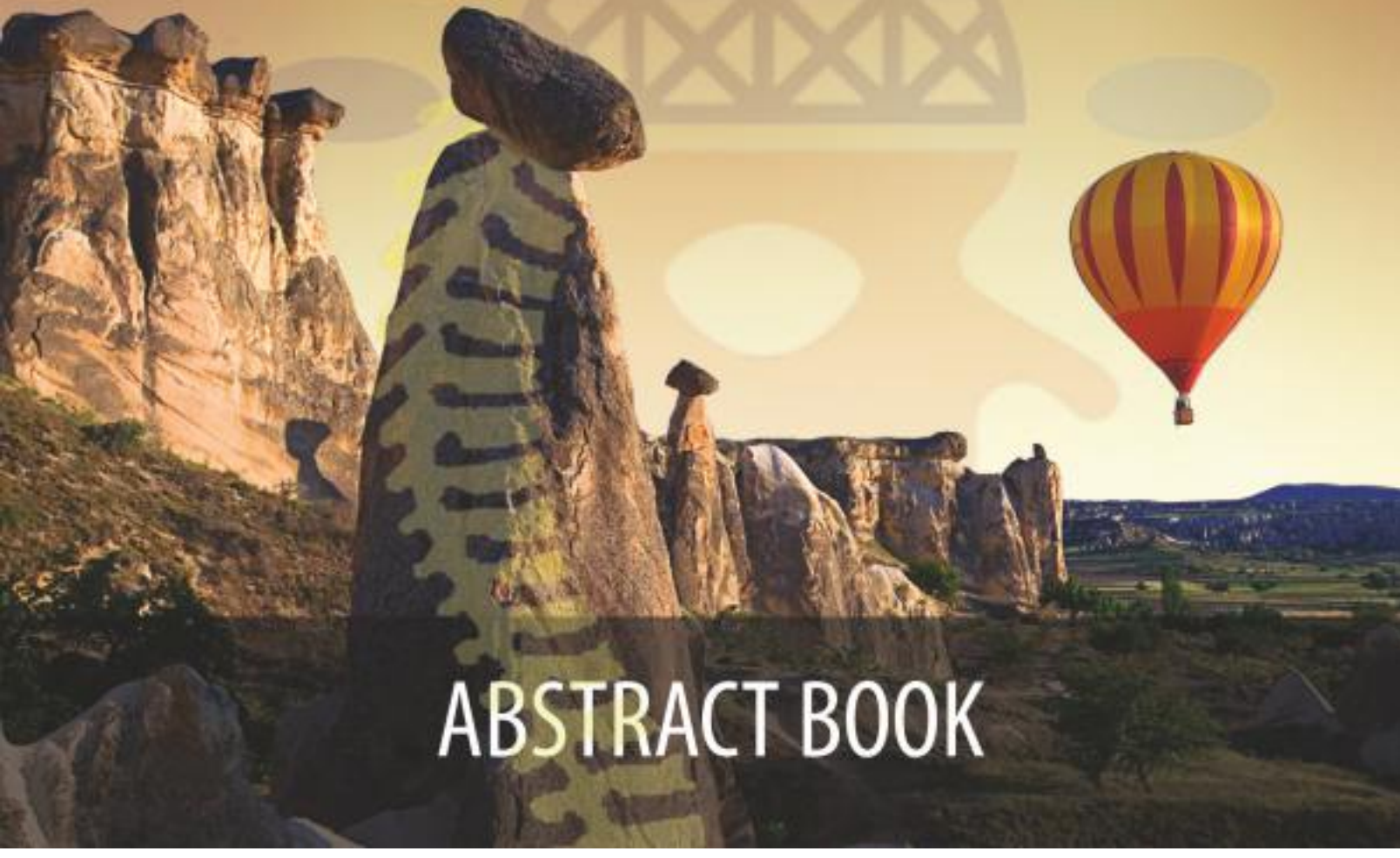




Xth International Turkish Spine Congress

Endorsed by SRS

17-20 April 2013, Cappadocia, TURKEY



ABSTRACT BOOK

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Dear Colleagues,

On behalf of the Turkish Spine Society, we cordially invite you to participate in the 10th International Turkish Spine Congress, which is scheduled to take place in the world famous Cappadocia region of Turkey, on April 17 - 20, 2013. The meeting will offer a rich scientific programme in collaboration with Scoliosis Research Society.

Cappadocia is an ideal venue to have this meeting because of its natural beauty and cultural splendor. This attractive region contains several underground cities and caves largely used by early Christians as hiding places before they became an accepted religion. The rocks of Cappadocia eroded into hundreds of spectacular pillars that are called " fairy chimneys".

We hope that the unique region of Cappadocia will provide a memorable se_謝ng for a rewarding scientific experience.

Necdet Altun, MD

Co-Chair of Congress

Professor of Orthopaedics and Traumatology

Şükrü Çağlar, MD

Co-Chair of Congress

Professor of Neurosurgery

ORGANIZING COMMITTEE

Congress Co-President

Necdet Altun, MD

Congress Co-President

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Tarık Yazar, MD

SCIENTIFIC PROGRAMME

April 18, SCIENTIFIC PROGRAM	
10:00-12:00	SESSION 1 TRAUMA
10:00-10:20	Lecture: Management Spinal Cord Injury: An Update - Richard Fessler Lecture Chair: Ufuk Aydınli
10:20-10:40	Debate: Early vs Late Surgery in Spinal Trauma With SCI Debate Chair: Ufuk Aydınli
10:00-10:30	Coffee Break
10:40-11:00	Lecture: An Update on Thoracolumbar Fracture Classifications - Ferran Pellise Lecture Chair: Frank Schwab
12:00-13:30	Lunch (Workshops)
13:30-15:00	SESSION 2 TUMOR
13:30-14:00	Lecture: En Bloc Resections - Ziya Gökaslan Lecture Chair: Azmi Hamzaoglu
14:00-15:00	Panel: Management of Metastatic Lesions - Can Solakoğlu Panel Chair: Ziya Gökaslan
15:00-15:30	Coffee Break
15:30-16:30	SESSION 3 INFECTION
15:30-16:00	Lecture: TB Spine - Keith Luk Lecture Chair: Derya Dinçer - Bekir Yavuz Uçar
16:30-17:20	Oral Presentations Chair Hall A: Deformity in Growing Spine, Adult Deformity Co-Chairs: Serkan Erkan - Deniz Konya
16:30-16:35	S-1 MULTIPLE REGRESSION ANALYSIS OF FACTORS AFFECTING HRQL IN ADULT SPINAL DEFORMITY (ASD) EMRE ACAROGLU ¹ , UMIT OZGUR GULER ¹ , FERRAN PELLISE ² , MONTSE DOMINGO-SABAT ² , AHMET ALANAY ³ , FRANCESCO SANCHEZ PEREZ-GRUESO ⁴ , YALCIN YAVUZ ¹ , YASEMIN GENÇ ¹
16:35-16:40	S-2 THE ADHERENCE TO LENKE RULES IN IDIOPATHIC SCOLIOSIS. ARE WE TREATING ADULTS DIFFERENTLY FROM ADOLESCENTS? FRANCISCO JAVIER SANCHEZ PEREZ-GRUESO ³ , MAR PEREZ BUITRAGO ³ , FERRAN PELLISE ⁴ , MONTSE DOMINGO AHMET ALANAY ¹ , EMRE ACAROGLU ² , JOSE MIGUEL SANCHEZ ³ , ESSG EUROPEAN SPINE ESTUDY GROUP ⁴
16:40-16:45	S-3 THE USE OF SIMULTANEOUS MULTILEVEL PEDICLE SUBTRACTION OSTEOTOMIES TO CORRECT SEVERE DEFORMITIES IN ANKYLOSING SPONDILITIS KAMIL ÇAGRI KOSE ¹ , MUSTAFA ERKAN INANMAZ ¹ , ISLAM CALISKAN ² , HAKAN BASAR ² , EMRE BAL ²
16:45-16:55	Debate
16:55-17:00	S-4 RELIABILITY OF SAGITTAL PELVIC PARAMETERS' MEASUREMENT USING THE NEW SRS COMPUTERIZED TOOL. THE EFFECT OF LUMBOSACRAL INSTRUMENTATION AND MEASUREMENT EXPERIENCE. FERRAN PELLISE ¹ , ALBA VILA-CASADEMUNT ¹ , EMRE ACAROGLU ³ , FRANCISCO J SANCHEZ PEREZ-GRUESO ³ , IBRAHIM OBEID ⁴ , JOAN BAGO ¹ , ESSG EUROPEAN SPINE STUDY GROUP ¹
17:00-17:05	S-5 DOES THE SRS-SHWAB CLASSIFICATION SUFFICE TO DEFINE ADULT SPINAL DEFORMITY? FERRAN PELLISE ¹ , MONTSE DOMINGO-SABAT ¹ , EMRE ACAROGLU ² , FRANCISCO J. SANCHEZ PEREZ-GRUESO ³ , AHMET ALANAY ⁴ , ALBA VILA-CASADEMUNT ¹ , JOAN BAGO ¹ , ESSG EUROPEAN SPINE STUDY GROUP ¹
17:05-17:10	S-6 PARASPINAL MUSCLES ACTIVITY DURING TRUNK LATERAL BENDING MOVEMENTS IN STANDING AND FROM ADOLESCENT TO ADULT PATIENTS SCOLIOSIS NADER FARAHPOUR ¹ , HANANE YOUNESIAN ¹ , PAUL ALLARD ²
17:10-17:20	Debate
16:30-17:30	Oral Presentations Chair Hall B: Deformity in Growing Spine, Adult Deformity, Congenital Malformations of Spinal Column Co-Chairs: Mehmet Fethi Ceylan- Murat Songür
16:30-16:35	S-7 THE DEVELOPMENT OF SCOLIOSIS AND KYPHOSIS IN PATIENTS WHO TREATED WITH STERNOTOMY OR TORACOTOMY DUE TO CONGENITAL HEARTH DISEASE MEHMET NURULLAH ERMIS, CAN SOLAKOGLU, OMER POLAT, FERIT MANGAL, FAIK MURAT UNSAL, ENDER UGUTMEN
16:35-16:40	S-8 IS DISTAL FUSION LEVEL RELATED WITH QUALITY OF LIFE ? OMER ERSEN ¹ , SELAHATTIN OZYUREK ² , SAFAK EKINCI ³ , SERKAN BILGIC ⁴ , KENAN KOCA ⁴ , ERBİL OGUZ ⁴ , ALI SEHIRLIOGLU ⁴

16:40-16:45	S-9 IS INTRAOPERATIVE PRONE RADIOGRAPH HELPFUL TO PREDICT RADIOGRAPHIC RESULT FOR LENKE TYPE 1 AND 3 PATIENTS TREATED BY SELECTIVE FUSION? <i>MERIC ENERCAN, CAGATAY OZTURK, SINAN KAHRAMAN, ALAUDDIN KOCHAI, GURKAN GUMUSSUYU, AZMI HAMZAOGLU</i>
16:45-16:50	S-10 DEFORMITY CORRECTION WITH DEROTATION TECHNIQUE IN THE TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS: MINIMUM ONE YEAR FOLLOW-UP <i>MURAT KORKMAZ¹, OKAN OZKUNT², OZCAN KAYA¹, FATIH DIKICI¹, UNSAL DOMANIC¹, KERIM SARIYILMAZ³</i>
16:50-17:00	Debate
17:00-17:05	S-11 DIRECT REPAIR OF LUMBAR SPODYLOLYSIS BY SEGMENTAL PEDICLE SCREW-INFRA LAMINAR HOOK CONSTRUCT <i>CAGATAY OZTURK, GURKAN GUMUSSUYU, MERIC ENERCAN, SINAN KAHRAMAN, FETHI CEYLAN, AZMI HAMZAOGLU</i>
17:05-17:10	S-12 RELIABILITY AND VALIDITY OF THE ADAPTED TURKISH VERSION OF THE EOSQ QUESTIONNAIRE <i>H. GOKHAN DEMIRKIRAN³, Z. DENIZ OLGUN³, SAYGIN KAMACI³, GIZEM I. KINIKLI¹, YASEMIN GENÇ², MUHARREM YAZICI³</i>
17:10-17:15	S-13 WHICH FACTORS PREDICT SHOULDER ASYMMETRY IN PATIENTS WITH LENKE TYPE 1 CURVES FOLLOWING PEDICLE SCREW INSTRUMENTATION? <i>MERIC ENERCAN, SINAN KAHRAMAN, CAGATAY OZTURK, ALAUDDIN KOCHAI, AHMET ALANAY, AZMI HAMZAOGLU</i>
17:15-17:20	S-14 HEMIVERTEBRA RESECTION VIA POSTERIOR APPROACH IN CHILDREN UNDER AGE OF FIVE YEARS WITH MORE THAN FIVE YEARS FOLLOW-UP <i>SINAN KAHRAMAN, AZMI HAMZAOGLU, MERIC ENERCAN, GURKAN GUMUSSUYU</i>
17:20-17:30	Debate
17:30-19:00	TSS Business Meeting

April 19, SCIENTIFIC PROGRAM	
08:30-10:00	SESSION 4 PEDIATRIC DEFORMITY (Early Onset)
08:30-08:55	Lecture: The Etiology of AIS, an Update - Emre Acaroğlu
	Lecture Chair: Mahir Gülşen
08:55-09:20	Panel: Congenital Deformity
	Panel Chair: Mahir Gülşen - Mehmet Fatih Korkmaz
09:20-10:00	My Worst Case
	EOS Chair: Mehmet Akif Kaygusuz
10:00-10:30	Coffee Break
10:30-12:00	SESSION 5 PEDIATRIC DEFORMITY (AIS)
10:30-11:20	Panel: AIS
	Panel Chair: Necdet Altun - Serdar Akalın
12:00-13:30	Lunch (Workshops)
13:30-15:00	SESSION 6 DEGENERATIVE - LUMBAR
13:30-14:00	Lecture: Algologic Management of LBP - Avni Babacan
	Lecture Chair: Önder Aydıngöz
14:00-14:40	Panel: Low Back Pain
	Panel Chair: Esat Kiter - Serdar Kahraman
15:00-15:30	Coffee Break
15:30-17:00	SESSION 7 DEGENERATIVE - CERVICAL
15:30-16:00	Lecture: Management Algorithms in Cervical Radiculopathy - Yasuhisa TANAKA
	Lecture Chair: Şükrü Çağlar
16:00-16:40	Round Table: Cervical Disc Herniation
	Round Table Chair: Şükrü Çağlar - Ömer Akçalı
16:40-17:00	Debate: Cervical Spondylolitic Myelopathy Ant vs Post
	Debate Chair: Keith Luk - Erdal Çoşkun
17:00-18:00	Oral Presentations Chair Hall A: Spinal Trauma, Tumors and Infections of Spine, Minimally Invasive Interventions and Novel Technologies Co-Chair: Abdullah Milcan - Çağatay Öztürk
17:00-17:05	S-15 MANAGEMENT OF TYPE A3 THORACOLUMBAR BURST FRACTURES WITH A NEW POSTERIOR REDUCTION TECHNIQUE AND SHORT SEGMENT TRANSPEDICULAR INSTRUMENTATION <i>KAMIL CAGRI KOSE¹, MUSTAFA ERKAN INANMAZ¹, HAKAN BASAR¹, CENGİZ ISIK², EMRE BAL¹, ISLAM CALISKAN¹</i>
17:05-17:10	S-16 MODIFIED POSTERIOR VERTEBRAL COLUMN RESECTION FOR THE TREATMENT OF VERTEBRAL INFECTIONS IN ELDERLY PATIENTS <i>CAGATAY OZTURK, SINAN KAHRAMAN, MERIC ENERCAN, BEKİR YAVUZ UCAR, AHMET ALANAY, AZMI HAMZA OGLU</i>
17:10-17:15	S-17 MODIFIED POSTERIOR VERTEBRAL COLUMN RESECTION FOR THE TREATMENT OF OSTEOPOROTIC FRACTURES WITH NEUROLOGICAL DEFICIT IN ELDERLY PATIENTS <i>MERIC ENERCAN, CAGATAY OZTURK, SINAN KAHRAMAN, BEKİR YAVUZ UCAR, GURKAN GUMUSSUYU, AZMI HAMZA OGLU</i>
17:15-17:20	S-18 CORELATION OF 3D COMPUTERIZED TOMOGRAPHY MORPHOMETRIC ANALYSIS OF LOMBER SPINE WITH GENDER, AGE AND HEIGHT IN TURKISH POPULATION <i>ALI GULEC⁻¹, BURKAY KUTLUHAN KACIRA², HARUN KUTAHYA³</i>
17:20-17:30	Debate
17:30-17:35	S-19 CLINICAL AND RADIOLOGICAL OUTCOME OF THORACOLUMBAR FRACTURES TREATED BY OPEN AND MINIMALLY INVASIVE POSTERIOR SPINAL STABILIZATION-A SHORT TERM STUDY <i>VENKATESH KUMAR GANESAN</i>
17:35-17:40	S-20 THE EFFECTS OF DIFUMARATE SALT S-15176 IN SPINAL CORD INJURY <i>HAKAN ERDOGAN¹, OSMAN AKDEMİR², BİLAL KELTEN¹, SEYHO CEM YUCETAS³, MATEM TUNCDEMİR⁴, MELEK OZTURK⁴, ALPER KARAOGLAN¹</i>

17:40-17:45	S-21 SPINAL METASTATIC DISEASE; SURVIVAL ANALYSIS OF 146 PATIENTS AND EVALUATION OF FOUR DIFFERENT PREOPERATIVE SCORING SYSTEMS <i>ALIHAN DERINCEK, MUSTAFA UYSAL, METIN OZALAY, VAHID BATTAL</i>
17:45-17:50	S-22 SURGICAL TREATMENT OF TUBERCULOUS SPONDYLITIS <i>IBRAHIM KAYA¹, NECDET SAGLAM², MURAT YILMAZ¹, SEVDA UGRAS⁴, AKIN UGRAS¹, FATIH DIKICI³</i>
17:50-18:00	Debate
17:00-18:00	Oral Presentations Chair Hall B: Deformity in Growing Spine, Adult Deformity Co.Chair: Erbil Oğuz - Selim Karabekir
17:00-17:05	S-23 THE ROLE OF PELVIC ASYMMETRY IN THE AETIOLOGY OF ADOLESCENT IDIOPATHIC LUMBAR SCOLIOSIS <i>BAYRAM ERGIN, HALUK BERK, OMER AKCALI</i>
17:05-17:10	S-24 DOES ALL SEGMENT IMPLANTATION CAUSE MORE CORRECTION OF LENKE 1 ADOLESCENT IDIOPATHIC SCOLIOSIS <i>OMER ERSEN¹, ERBIL OGUZ², SAFAK EKINCI³, SELEHATTIN OZYUREK⁴, KENAN KOCA², SERKAN BILGIC²</i>
17:10-17:15	S-25 DUAL GROWING ROD TECHNIQUE IN EARLY ONSET SCOLIOSIS: IMPLANT-RELATED COMPLICATIONS <i>METIN OZALAY, MURAT CINAR, MUSTAFA UYSAL, ALIHAN DERINCEK</i>
17:15-17:20	S-26 APICAL SHORT-SEGMENT CORRECTION IN ADOLESCENT IDIOPATHIC SCOLIOSIS: A MULTICENTER STUDY OF A NEW INNOVATIVE POSTERIOR TECHNIQUE <i>BURAK AKESEN¹, UFUK AYDINLI³, MARTIN REPKO⁶, LUBOS REHAK⁴, MICHEAL GREVITT⁵, MARTIN ZABKA⁴, COLIN NNADI⁷, ALLEN CARL⁸</i>
17:20-17:30	Debate
17:30-17:35	S-27 COMPUTER-ASSISTED OSTEOTOMY PLANNING FOR SAGITTAL PLANE DEFORMITIES <i>AKIF ALBAYRAK, SECKIN SARI, YUNUS ATICI, MEHMET AKIF KAYGUSUZ, MEHMET TEMEL TACAL, DENIZ KARGIN</i>
17:35-17:40	S-28 SURGERY FOR ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS): TWO STEPS FORWARD ONE STEP BACK FOR CORONAL PLANE CORRECTION <i>UMIT OZGUR GULER, YASEMIN GENC, EMRE ACAROGLU</i>
17:40-17:45	S-29 CONVEX INSTRUMENTED HEMIEPIPHYSIODESIS WITH CONCAVE DISTRACTION: A NEW TREATMENT MODALITY FOR LONG SWEEPING CONGENITAL CURVES <i>H. GOKHAN DEMIRKIRAN¹, OZGUR DEDE¹, MEHMET AYVAZ¹, AHMET ALANAY², MUHARREM YAZICI¹</i>
17:45-17:50	S-30 DETERMINATION OF THE LOWEST INSTRUMENTED VERTEBRA ON TREATMENT OF SCHEURMAN KYPHOSIS <i>TURGUT AKGUL, CUNEYT SAR, NATIQ VALIYEV</i>
17:50-18:00	Debate

April 20, SCIENTIFIC PROGRAM	
08:30-10:00	SESSION 8 MINIMALLY INVASIVE
08:30-08:50	Lecture: Limits Of The Minimally Invasive Surgery - Richard Fessler
	Lecture Chair: Tarık Yazar
08:50-09:30	Panel: Percutaneous Fixation
	Panel Chair: Tarık Yazar - Özgür Yıldırım
10:00-10:30	Coffee Break
10:30-12:00	SESSION 9 COMPLICATION
10:30-11:00	Lecture: Causes and Management of Failed Low Back and Cervical Surgery - Selçuk Palaçoğlu
	Lecture Chair: Haluk Berk
11.30-12:00	Closing Ceremony
12:00-13:30	Lunch (Workshops)
13:30-15:00	SESSION 10 OSTEOPOROTIC SPINE
13:30-14:20	Round Table: Osteoporotic Spine
	Round Table Chair: Nuri Erel
17:00-17:50	Oral Presentations Chair Hall A: Minimally Invasive Interventions and Novel Technologies, Degenerative Conditions of Spine Osteoporotic Spine Co-Chair: Cihangir İslam - Serkan Bilgiç
17:00-17:05	S-31 FEMORAL STRUT ALLOGRAFTS HELP TO CLOSE LAMINECTOMY DEFECTS AND PREVENT IT'S POTENTIAL COMPLICATIONS <i>MERIC ENERCAN, CAGATAY OZTURK, SINAN KAHRAMAN, BEKIR YAVUZ UCAR, AZMI HAMZAOGLU, AHMET ALANAY</i>
17:05-17:10	S-32 AUGMENTATION OF PEDICLE SCREWS WITH CEMENT HELPS TO PREVENT MECHANICAL FAILURE IN ELDERLY PATIENTS WITH >5 LEVELS INSTRUMENTATION: A CT ANALYSIS OF 688 PEDICLE SCREWS <i>MERIC ENERCAN, CAGATAY OZTURK, SINAN KAHRAMAN, BEKIR YAVUZ UCAR, LEVENT ULUSOY, AZMI HAMZAOGLU</i>
17:10-17:15	S-33 PROPHYLACTIC VERTEBROPLASTY OF ADJACENT NON-FUSED SEGMENT(S). IT'S EFFECT ON ADJACENT DISCS AND THE INFLUENCE OF SAGITTAL MALALIGNMENT ON IT'S EFFICACY? AN MRI STUDY <i>SINAN KAHRAMAN, MERIC ENERCAN, GURKAN GUMUSSUYU, CAGATAY OZTURK, AHMET ALANAY, AZMI HAMZAOGLU</i>
17:15-17:25	Debate
17:25-17:30	S-34 RADIOLOGICAL AND CLINICAL OUTCOME OF THE OPERATED AND ADJACENT SEGMENTS FOLLOWING CERVICAL ARTHROPLASTY AFTER A MINIMUM 24-MONTH FOLLOW-UP: A SINGLE SURGEON-CENTER EXPERIENCE <i>MURAT SIRIKCI, MERIC ENERCAN, SINAN KAHRAMAN, MERCAN SARIER, IBRAHIM ORNEK, CAGATAY OZTURK, AZMI HAMZAOGLU</i>
17:30-17:35	S-35 EFFECTS OF PLIF AND TLIF SURGERY ON RADIOLOGICAL PARAMETERS OF LUMBOSACRAL VERTEBRA IN DEGENERATIVE SPONDYLOLISTHESIS <i>MUSTAFA UYSAL, ALIHAN DERINCEK, METIN OZALAY</i>
17:35-17:40	S-36 BIOMECHANICAL COMPARISON OF DYNESYS AND COFLEX DYNAMIC STABILIZATION SYSTEMS ON RANGE OF MOTION AND LOADING CHARACTERISTICS OF LUMBAR SPINE : A FINITE ELEMENT STUDY <i>AHMET KULDUK¹, ALPASLAN SENKOYLU², NECDET SUKRU ALTUN²</i>
17:40-17:50	Debate

ORAL PRESENTATIONS

S-1 MULTIPLE REGRESSION ANALYSIS OF FACTORS AFFECTING HRQL IN ADULT SPINAL DEFORMITY (ASD)

EMRE ACAROGLU¹, UMIT OZGUR GULER¹, FERRAN PELLISE², MONTSE DOMINGO-SABAT², AHMET ALANAY³, FRANCESCO SANCHEZ PEREZ-GRUESO⁴, YALCIN YAVUZ¹, YASEMIN GENÇ¹

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⁵ THE EUROPEAN SPINE STUDY GROUP

Background & Aims:

Different age and diagnosis groups present with different problems in ASD population. Indicators of sagittal misalignment have also been proposed to be good predictors of HRQL. It is probable that the parameters are intercorrelated and may not be key factors per se. The aim of this study is to understand the ranking of parameters affecting HRQL in ASD using multiple regression analysis.

Methods:

483 patients enrolled in a prospective multicentric database. Multiple regression analysis was performed for SRS22 and ODI separately. The initially proposed primary variables such as age and L Gap could not be used together because of a very high multicollinearity and CCL because it was not found to be significant. A root model with diagnosis and then two separate simple models with age and L Gap were used.

Results:

See Table 1 for details of analysis. For ODI; only BMI and gender in the model with L Gap and only gender in the model with age proved to be highly predictive. For SRS22; BMI, gender, coronal balance, L curve, and SVA in the model with L Gap and only gender in the model with age proved to be highly predictive. CCL was not significantly predictive in any model.

Conclusion:

These findings reiterate the importance of patient diagnosis, age and/or the amount of lordosis as the most important factors affecting HRQL in ASD. Gender, BMI and SVA appear to be consistently important co-variables whereas coronal balance and magnitude of L curves may also be important in SRS22. These findings may prove to be important for a better understanding of the problem in ASD and may prove to be useful in future classifications.

S-2 THE ADHERENCE TO LENKE RULES IN IDIOPATHIC SCOLIOSIS. ARE WE TREATING ADULTS DIFFERENTLY FROM ADOLESCENTS?

FRANCISCO JAVIER SANCHEZ PEREZ-GRUESO³, MAR PEREZ BUITRAGO³, FERRAN PELLISE⁴, MONTSE DOMINGO⁴, AHMET ALANAY¹, EMRE ACAROGLU², JOSE MIGUEL SANCHEZ³, ESSG EUROPEAN SPINE ESTUDY GROUP⁴

¹ ~~ACIBADEM MASLAK HOSPITAL~~ FACULTY OF MEDICINE

³ HOSPITAL UNIVERSITARIO LA PAZ

⁴ HOSPITAL UNIVERSITARIO VALL D'HEBRON

Background & Aims:

Evaluate the adherence to the Lenke classification in the fusion level selection in adult idiopathic scoliosis (AS), to compare these results with adolescent idiopathic scoliosis (AIS).

Methods:

Two groups 1) Adults: Patients accomplishing these inclusion criteria: age 18-40, idiopathic scoliosis, no major radiological degenerative changes. 2) Adolescents: Matched number of AIS patients treated by the same surgeons during the same period. An independent observer classified all curves by Lenke's guidelines and identified "Rule-breakers" using postop x-rays. Statistical analysis was done with Fisher's test.

Results:

Forty AS patients (av age 26yr, 18-36) and 41 AIS patients (av age 14.5yr, 12-17). Lenke1 curves were predominant in both samples (Table1). Guidelines were not adhered to in 38% of AS and in 44% of AIS (p>0,05). Lenke1 curves had the highest proportion of rule breakers in both groups (52% AIS vs 61% AS). Upper thoracic region and selection of upper fusion levels were the most frequent reasons for rule breaking in both groups followed by curves with lumbar modifiers B and C in which the lumbar curves were fused. There were three patients in AS group and two in the AIS where the rules were broken with shorter fusions.

Conclusion:

The adherence to Lenke classification in AS appears to be similar to AIS although the adherence in this group was less than previously reported. Upper thoracic spine turned out to be the most controversial region in the fusion level selection process for which deviations from guidelines resulted in longer fusions.

S-3 THE USE OF SIMULTANEOUS MULTILEVEL PEDICLE SUBTRACTION OSTEOTOMIES TO CORRECT SEVERE KYPHOSES IN ANKYLOSING SPONDILITIS

KAMIL ÇAGRI KOSE ¹, MUSTAFA ERKAN INANMAZ ¹, ISLAM CALISKAN ², HAKAN BASAR ², EMRE BAL ²

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² SAKARYA TRAINING AND RESEARCH ORTHOPEDICS AND TRAUMATOLOGY

Background & Aims:

Various osteotomies have been devised to treat the kyphosis in ankylosingspondilitis patients, most widely used being the pedicle subtraction osteotomy (PSO). One level PSO is frequently used but to our knowledge simultaneous multilevel osteotomies have never been reported.

Methods:

Six patients have undergone multilevel PSO in one stage between 2010-2012. 4 patients had 2 level and 2 had 3 level osteotomies. The mean preoperative global spinal kyphosis angles were 107.4 (range 80-135) The mean sagittal imbalance was 24 cm forward. The thoracic osteotomies were done at T7-T8-T11 levels. The lumbar osteotomies were done at L2.

Results:

The average age was 46.8 years (range 37-53 years). The duration of follow-up was 15,3 months. The mean duration of operation was 270 minutes. The mean amount of blood loss was 1460 cc. Significant correction of deformities could be achieved. The sagittal balance was corrected to 2,8 cm. The mean kyphosis angle decreased to 44,6. No patient had neurologic deficits, pseudoarthrosis, deep infection or implant failure. One had aseptic wound drainage due to allografts.

Conclusion:

Simultaneous multilevel osteotomies can correct the rigid kyphosis in the severely deformed ankylosed spine and can be performed in a safe manner.

S-4 RELIABILITY OF SAGITTAL PELVIC PARAMETERS' MEASUREMENT USING THE NEW SRS COMPUTERIZED TOOL. THE EFFECT OF LUMBOSACRAL INSTRUMENTATION AND MEASUREMENT EXPERIENCE.

FERRAN PELLISE ¹, ALBA VILA-CASADEMUNT ¹, EMRE ACAROGLU ³, FRANCISCO J SANCHEZ PEREZ-GRUESO ², IBRAHIM OBEIDI ⁴, JOAN BAGO ¹, ESSG EUROPEAN SPINE STUDY GROUP ¹

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³ ANKARA SPINE CENTER

Background & Aims:

Measurement of sagittal pelvic parameters (SPP) is critical for proper surgical planning. Instrumented flat-back is a common cause of sagittal imbalance. SPP measurement accuracy has never been assessed in instrumented spines. To assess the reliability of SPP measurement using the new SRS computerized tool (Surgimap). To compare instrumented and non-instrumented spines as well as different levels of expertise.

Methods:

Sixty-three adult full-spine standing lateral radiographs (31 with lumbosacral instrumentation) were measured twice by 13 observers using Surgimap. Observers were stratified into 3 levels of experience: high=research coordinators(4), mid=senior surgeons(5) and low=junior surgeons(4). Research coordinators trained all surgeons for less than 30 minutes. Parameters measured were: Pelvic Incidence (PI), Pelvic Tilt (PT) and Sacral Slope (SS). Estimated coefficient of reliability ICC (95% CI) and Standard Error of Measurement (SEM) were used for analysis.

Results:

Thirteen observers and 63 radiographs generated 817 observations (2 misses). Overall inter- and intra-observer reliability of SPP measurement was excellent (ICC>0.85) (Table). Lumbosacral instrumentation did not modify intra-observer reliability but reduced significantly inter-observer reliability of PT (p=0.006) (ICC 0.92 / SEM 2.2deg) and SS (p=0.007) (ICC 0.77 / SEM 4.4deg). Experience did not affect intra-observer reliability but inter-observer reliability of highly experienced observers was significantly lower (p<0.05) than among less experienced observers.

Conclusion:

Measurement of SPP by Surgimap equals or improves previously reported reliability data. Lumbosacral instrumentation reduces inter-observer reliability. Inexperienced observers can measure SPP reliably with Surgimap, following a short tutorial.

S-5 DOES THE SRS-SCHWAB CLASSIFICATION SUFFICE TO DEFINE ADULT SPINAL DEFORMITY?

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Background & Aims:

SRS-Schwab Adult Spinal Deformity (ASD) classification has been shown to be reliable. The incidence and patient's characteristics for each curve type are still unknown. We hypothesized that the SRS-Schwab ASD classification may not identify homogeneous groups of patients.

Methods:

Baseline data (radiological and health related quality of life – HRQL) of patients with degenerative or idiopathic deformity, consecutively enrolled in a prospective multicenter database, was analyzed. Inclusion criteria: age>18 years and scoliosis>20°, sagittal vertical axis>5cm, pelvic tilt>25° or thoracic kyphosis>60°. Patients' characteristics and incidences were evaluated for each coronal curve type.

Results:

368 patients, mean age 44.1 yrs (18-88), 83.9% female, were evaluated. Incidence of curve types: T 14.3%, L 16.3%, D 40.4% and N 28.9%. In N pattern 56.6% of cases had minor (20-30°) coronal and 43.4% pure sagittal deformity. ASD was idiopathic in 73.1% of cases and degenerative in 26.9%. Idiopathic and degenerative curves had different curve pattern distribution and sagittal modifiers' scores (Table). We found clinically and statistically significant differences in age-gender-adjusted SF36 PCS (p<0.01), ODI (p<0.001) and SRS-subtotal (p<0.01) between T or D and L curves, L curves having worse HRQL scores. These differences were found to disappear when idiopathic and degenerative curves were analyzed separately. Degenerative L and N patients had worse HRQL scores compared to L and N idiopathic patients (Table).

Conclusion:

In the new SRS-Schwab ASD classification D and N patterns are predominant. This classification does not identify homogeneous groups of patients. Adding the etiology parameter to that of coronal curve pattern increases homogeneity of patient subgroups.

S-6 PARASPINAL MUSCLES ACTIVITY DURING TRUNK LATERAL BENDING MOVEMENTS IN STANDING AND PRONE POSITIONS IN PATIENTS SCOLIOSIS

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Background & Aims:

The objectives of this study were to analyze electromyographical (EMG) activity of paraspinal muscles of scoliotic trunk during lateral bending motions in standing and prone positions.

Methods:

Ten healthy adolescent girls (CG) (13.6±0.9yrs) and 10 AIS patients with right thoracic (ages: 14.0±0.4yrs ; Cobb angle 10° to 25°) were studied. EMG activity of paraspinal muscles at T6 (PST6), T10 (PST10) and L3 (PSL3) levels as well as oblique external (OE) muscles in both the right and the left sides were measured during dynamic right and left lateral bending motions in a) standing and b) prone position. The RMS values were normalized with respect to the RMS values of the maximum voluntary isometric contraction.

Results:

In CG, overall, normalized RMS for PST6, PST10, PSL3 and OE muscles were %13.8±2.3; %14.2±1.9, %9.5±0.8 and %5.7±0.9 respectively. PST6, PST10 and OE muscles showed similar activity in both bending positions (p=0.10). Overall, RMS values in AIS were greater than CG. Muscles at convex side had greater activity than the concave side (P<0.05) in AIS.

Conclusion:

AIS is associated with asymmetrical PS muscle's function during lateral bending. Lateral bending motion seems promising to distinguish between progressing scoliosis curvature and non-progressing curvature that is recommended for future studies.

S-7 THE DEVELOPMENT OF SCOLIOSIS AND KYPHOSIS IN PATIENTS WHO TREATED WITH STERNOTOMY OR TORACOTOMY DUE TO CONGENITAL HEARTH DISEASE

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Background & Aims:

To evaluate the prevalence of scoliosis and kyphosis development in patients treated surgically via medial sternotomy or left thoracotomy due to congenital heart anomalies.

Methods:

One hundred and seventy patients included in this study who treated with surgery due to congenital heart diseases (CHD's) between 1987 and 2009. One hundred and two of the patients were female (60%) and 68 were male (40%). The CHD's of the patients are grouped as cyanotic (149 patients, 87.6%) and acyanotic (21 patients, 12.4%). While the number of the patients who were operated before the age of 5 was 131 (77%), the number of the ones over the age of 5 was 39 (23%). Sternotomy was applied to 158 patients and the other 12 were operated via left thoracotomy.

Results:

We detected scoliosis in 25.2% of the patients (43 out of 170). While the Cobb measurement was between 10 to 20 degrees in 86% of the cases, the rest (14%) was over 20 degrees. It is found that there was no statistical significance in regards to scoliosis progression between the sternotomy and thoracotomy patients ($p=0.161$). While the average kyphosis angle was found as 32.92 degrees in sternotomy patients, it was 29.67 degrees in thoracotomy patients. The average T2-T5 kyphosis was found as 14.5 degrees and the average T5-T12 kyphosis was 16.2 degrees. There was no statistically significant difference between thoracotomy and sternotomy patients in regard to scoliosis progression ($p=0.532$ and $p=0.107$).

The T2-T5 kyphosis angle of scoliosis patients was found considerably lower when compared to no scoliosis patients. The scoliosis prevalence rate was found 8.42 fold increased in children operated under the age of 5 in regard to the ones operated over the age of 5. There was no statistically significant difference whether the heart disease was cyanotic or acyanotic in respect to scoliosis or kyphosis progression ($p=0.362$, $p=0.586$, $p=0.184$).

Conclusion:

The scoliosis prevalence rate is found increased in patients treated either with sternotomy or thoracotomy because of CHD, and T2-T5 kyphosis is also found increased according to normal population. The spinal deformities are more commonly observed in children operated under the age of 5.

S-8 IS DISTAL FUSION LEVEL RELATED WITH QUALITY OF LIFE ?

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Background & Aims:

The most common treatment of adolescent idiopathic scoliosis (AIS) is posterior fusion. Curve correction achieved does not always mesh with quality of the patient. There are several questionnaires to evaluate the quality of life for scoliosis patients. This study evaluates the effect of distal fusion level of posterior fusion on quality of life.

Methods:

Between April 2009 and October 2012 on follow up visit 48 patients who had undergone posterior fusion surgery for AIS at least 2 years ago asked to fill SRS-22 questionnaire after radiological evaluation. Residual deformity was assessed on x-rays. According to distal fusion level patients divided into 4 groups.

Results:

Distal fusion level was L1 in 10 patients, L2 in 18 patients, L3 in 14 patients and L4 in 6 patients. Average patient age was $17,3 \pm 2,4$ and average postoperative period was $37,2 \pm 18,2$ months. As expected pain score of L4 group was the lowest and self image score of L4 group was the highest. Function/Activity score of L1 group was the highest and of L4 group was the lowest. The groups were similar according to mental health and satisfaction from treatment.

Conclusion:

Fusion level of AIS patients is related to quality of life according to SRS-22 questionnaire especially in pain, self image and function domains.

S-9 IS INTRAOPERATIVE PRONE RADIOGRAPH HELPFUL TO PREDICT RADIOGRAPHIC RESULT FOR LENKE TYPE 1 AND 3 PATIENTS TREATED BY SELECTIVE FUSION?

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Background & Aims:

It is often difficult to predict postop lumbar curve (L) magnitude and balance parameters while performing intraoperative correction during selective thoracic fusion. Aim of this study was to determine if 36-inch prone intraoperative films reflect the results at postoperative and f/up standing films.

Methods:

This is a retrospective review of 50 (47F, 3M) Lenke type 1 (LT1) and type 3 (LT3) AIS pts who underwent selective thoracic fusion in a single center. 36-inch standing Preoperative (Pre), prone intraoperative (Prone), Postoperative (Post) and Follow-up (Fup) x-rays were analyzed. Proximal thoracic (PT), Main thoracic (MT) and lumbar (L) curve magnitudes, lower instrumented vertebrae tilt (LIV), angulation of the disc below LIV (LIV-disc), coronal balance (C7-CSVL) were measured in each x-ray. The intraclass correlation coefficient (ICC) 2-way mixed model on absolute agreement was used to analyze measurement reliability.

Results:

All patients had PS instrumentation. 16 pts had LT1A, 23 had LT1C, 3 had LT3B and 8 had LT3C curves. Mean age was 14.2 (11-17) and f/up was 35 months. Mean preoperative magnitudes of PT, MT and L curves were 20° (3°-37°), 55° (40°-130°) and 39° (25°-89°) respectively. Mean correction rates were PT 65%(22.2-90), MT 76%(54.7-100) and L 56.6%(30.9-90).

There were no significant differences in terms of all curve correction and balance parameters between x-rays ($p>0.05$) (Table 1). There was a statistically significant correlation in all parameters ($p<0.05$) (Table 1). Compression or distraction maneuvers have been done in 16 pts based on recognition of unsatisfactory correction/alignment in Prone x-rays. None of the patients had re-interventions due to decompensation and/or increase in curve size post op or during f/up.

Conclusion:

Routine use of intraoperative prone x-ray guides intraoperative decision-making and enables appreciation of postop and ultimate correction and balance in LT1 and LT3 pts who had selective thoracic fusion.

S-10 DEFORMITY CORRECTION WITH DEROTATION TECHNIQUE IN THE TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS: MINIMUM ONE YEAR FOLLOW-UP

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Background & Aims:

The aim of the study is to evaluate the results of derotation technique in the treatment of adolescent idiopathic scoliosis

Methods:

Between 1994-2009,246 patients(61 male, 185 female) with adolescent idiopathic scoliosis treated by posterior spinal instrumentation and fusion with derotation technique.All the operative procedures were performed by the same surgeon.Mean age was 15.4 (range 10-33).According to the Lenke classification,104 patients were type 1,13 patients were type 2,44 patients were type 3,29 patients were type 4,39 patients were type 5, and 17 patients were type 6,respectively.Twenty-nine patients had pelvic obliquity and 56 patients had shoulder asymmetry.Forty-two patients had positive coronal balance, and 28 patients had negative coronal balance.Thirty-five patients had positive sagittal balance and 64 patients had negative sagittal balance.Fifty-one patients had trunk shift.Mean major coronal Cobb angle was measured 58.9°(range 37°-112°).Mean thoracal kyphosis angle was measured 35.8° (range 15°-68°),and mean lumbar lordosis angle was measured 46.4° (range 19°-67°).

Results:

The mean follow-up period was 40 months. (range12-82) At the last follow-up the mean coronal Cobb angle was measured 10.1° (range 0°-41°),and coronal Cobb angle correction rate was 82.8 %.At the last follow-up,only five patients had pelvic obliquity, and 21 patients had shoulder asymmetry.Nine patients had positive coronal balance, and 11 patients had negative coronal balance. Eight patients had positive sagittal balance, and 52 patients had negative sagittal balance.We have no neurological complication.

Conclusion:

The derotation technique is safe and effective method in the treatment of adolescent idiopathic scoliosis.It provides good correction rate especially for coronal plane.

S-11 DIRECT REPAIR OF LUMBAR SPONDYLOLYSIS BY SEGMENTAL PEDICLE SCREW-INFRA LAMINAR HOOK CONSTRUCT

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Background & Aims:

Symptoms usually resolve with non-operative treatment in patients with spondylolysis. However, in some selected patients; operative treatment may be needed. Repair of pars defects is one of the surgical treatment alternatives and can be done by using several techniques. The aim of this study is to analyse the safety and efficacy of direct pars repair by using segmental pedicle screw-infralaminar hook construct.

Methods:

Twenty-five patients (21 female and 4 male) who had treated by direct pars repair with segmental pedicular screw-hook fixation and with minimum 2 years follow-up were included in this study. All patients had spondylolysis with isthmic defect at L5 (n=23) or L4 (n=2), and seven (28%) of them had grade 1 spondylolysis. Seven patients (28%) had mild scoliosis while 5 (20%) had Schuermann kyphosis. One patient had both scoliosis and Schuerman kyphosis. All had low back pain unresponsive to conservative measures for at least 6 months. None had radiculopathy signs.

All patients had a preoperative CT scan and magnetic resonance imaging and all had Phirman class I healthy discs at the involved level. All patients had CT scans at the postoperative 1 year follow-up to evaluate healing. Two-year follow-up x-rays were analysed in terms of disc degeneration and collapse at the operated level and progression of existing deformities.

Results:

The mean follow-up period was 38.7 (range; 24 to 84) months. Mean age was 16.4 (range; 14 to 23) years. CT scan revealed succesfull healing in all patients. None of the patients had degenerative findings at the disc level below the pars defect. All patients had succesfull clinical outcome. Three patients with Schuermann's kyphosis underwent surgery while none of the other patients with scoliosis and kyphosis had a progression in their deformities.

Conclusion:

Surgical treatment of adolescent patients with spondylolysis by using pedicle screw-infralaminar hook technique resulted with satisfactory clinical and radiological outcome.

S-12 RELIABILITY AND VALIDITY OF THE ADAPTED TURKISH VERSION OF THE EOSQ QUESTIONNAIRE

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Background & Aims:

Objective measures for the impact of single treatments on the quality of life are essential. Recently, such a tool was defined for the outcome and progress of early-onset scoliosis (EOS) in the form of a questionnaire (EOSQ). For its use in other countries, this measure needs to be adapted to the corresponding language and its validity determined.

Methods:

The EOSQ was translated and backtranslated according to WHO guidelines and its cultural adaptation performed by a committee of specialists. Patients under treatment for EOS were given the questionnaire during follow-up appointments along with CHQ, which is a previously validated measure, for concurrent validity. Data quality analysis of the items was performed, reliability determined by Cronbach alpha and concurrent validity with Pearson's coefficient.

Results:

61 patients (24M, 37F) with a mean age of 107 months (SD 38.9) filled out the adapted questionnaire. Twenty-two items had evenly distributed responses; ceiling effect was observed above 30% for 10 items. Item response was high and no missing answers were present. Cronbach's alpha was 0.911, indicating good reliability (>0.80) and all items were found to contribute to the scale. Results were compared according to gender, duration of follow-up, age at diagnosis and surgery, and age of parents (none significant, p>0.05). Ambulatory status was a significant factor in overall score (significantly low in paraplegics) while no difference was found between patients who did or did not undergo surgery. Scores in patients undergoing surgery increased significantly postoperatively (p<0.05).

Conclusion:

The Turkish version of the EOSQ shows reliability and validity compared to the original, with results of certain variables affecting scores as expected. Surgical status may not have affected scores due to the fact that more severe cases undergo surgery and less severe cases who do not require surgery score higher on the scale. This measure will be an important tool in the objective analysis of treatment outcomes for EOS.

S-13 WHICH FACTORS PREDICT SHOULDER ASYMMETRY IN PATIENTS WITH LENKE TYPE 1 CURVES FOLLOWING PEDICLE SCREW INSTRUMENTATION?

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*İSTANBUL SPINE CENTER, FLORENCE NIGHTINGALE HOSPITAL***Background & Aims:**

Postop frequent shoulder asymmetry (SA) has been reported to occur after surgical treatment of Lenke type 1 (LT1) curves. The aim of this retrospective study was to analyze SA and factors that may influence its occurrence and prevention in pts with LT1 curves.

Methods:

132 consecutive pts (av age 14.2 (11-17)) with LT1 curves and >2 y f/up were included. Radiographic analysis included Pre, post and f/up A-P and lateral standing, supine bending and traction x-ray under general anesthesia (TRUGA). Magnitudes of curves, T1 tilt (TT), clavicle angle (Cla), shoulder height (SH), were the measured asymmetry parameters (SAP). Preop and f/up SRS-22 and shoulder balance questionnaires were also analyzed.

Results:

82 pts had complete (UIV T2), 24 had incomplete (UIV T3) and 26 had non-fusion (UIV ≤ T4) of PT curve. Average correction rates were PT 64%, MT 80% and TL/L 65%. Postop, 58% pts had balanced shoulder while 30% had LSE and 12% RSE. There was a higher incidence of shoulder asymmetry in pts instrumented to T3 (70%) vs T2 (35%) and ≤ T4 (55%) (p=0.016). Higher %MT correction was correlated with LSE (p=0.042). Factors not correlated with SA were pre and post op PT, MT magnitude, %PT correction and lumbar modifier (p>0.05). TT, Cla and SH in TRUGA were correlated with SA and there were no significant differences in SAP between TRUGA and post-op x-rays (p>0.05) (table 1, fig 1). TRUGA had a PPV of 87% and NPV of 80% to predict shoulder imbalance for patients with non-fused PT (UIV ≤ T4). Preoperatively, 81% pts and at final f/up 10% pts thought they had shoulder asymmetry. Av SRS-22 score was 4.2 (3.6-5) and was similar in patients who had shoulder asymmetry (4,41) vs. no asymmetry (4,28) (p>0.05).

Conclusion:

Risk factors for SA include higher % correction of MT, incomplete fusion of PT. Extension of fusion to T2 although resulted with least % of pts with LSE, may not yet prevent its occurrence. TRUGA is helpful in predicting postop SA and most helpful in pts with non-fused PT curve. HRQL is similar in patients with SA vs. no SA

S-14 HEMIVERTEBRA RESECTION VIA POSTERIOR APPROACH IN CHILDREN UNDER AGE OF FIVE YEARS WITH MORE THAN FIVE YEARS FOLLOW-UP

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*İSTANBUL SPINE CENTER, FLORENCE NIGHTINGALE HOSPITAL***Background & Aims:**

In this retrospective study, we evaluated the radiological and clinical outcomes of patients under age of five years having posterior resection of hemivertebra and pedicle screw to correct and stabilize the deformity.

Methods:

Fifteen patients between age 2 and 5 years having posterior hemivertebrectomy and transpedicular fixation for congenital deformities who had more than five years follow-up were reviewed. The surgical technique includes posterior resection of hemivertebra with upper and lower disc spaces followed by short segment instrumentation. Compression is applied on the convex side. After gaining sufficient correction, gap is filled with titanium mesh cage. After surgery, patients were immobilized in a hip spica cast for 6 months and in a brace for 6 months more. Radiological and clinical charts were evaluated in terms of correction in coronal and sagittal plane deformity, balance and complications.

Results:

Mean follow-up was 6.7 years (range; 5 to 11). Average age of patients (5 male and 10 female) was 3.1 years (2-5). Fifteen patients had 18 hemivertebra levels. Two hemivertebrae were ipsilateral consequent (2 patients) and two were distant from each other in one patient.

Ten levels were scoliotic deformities with 33 degrees (range: 23 - 47), 8 levels were kyphoscoliotic deformities [mean scoliosis 29.4 degrees (range: 21 - 41)], [kyphosis 30.3 degrees (7 – 56)]. In 3 patients, two-level hemivertebra were present. Nine hemivertebrae were located in thoracic spine (T3-T11), 3 in thoracolumbar spine (T12-L1) and 6 in lumbar spine (L2-L5). There is no statistical difference between early postoperative and last follow-up coronal and sagittal plane deformities. The coronal plane deformity improved to 3.8 degrees (88%) and was 4.6 degrees at final follow-up in scoliotic levels. The coronal and sagittal plane deformities were found 2.7 degrees (91%) and 2.8 degrees (91%) respectively in kyphoscoliotic levels. They were 3.5 degrees and 3.6 degrees at final follow-up. No adding-on deformity was seen at final follow-up. Pseudoarthrosis or implant failure was not detected.

Conclusion:

Hemivertebra resection via posterior approach and short segment transpedicular instrumentation is safe and effective in children under age of five years with more than five years follow-up.

S-15 MANAGEMENT OF TYPE A3 THORACOLUMBAR BURST FRACTURES WITH A NEW POSTERIOR REDUCTION TECHNIQUE AND SHORT SEGMENT TRANSPEDICULAR INSTRUMENTATION

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Background & Aims:

To analyse the outcomes of a new technique in patients with thoracolumbar burst fractures.

Methods:

Forty-six patients (30m/16f) with traumatic TypeA3 thoracolumbar (T11-L3) fractures treated with a new posterior reduction technique and short- segment fixation between 2009-2011 were included. The radiological measurements included: local kyphosis (LK) ,sagittal index (SI),) and the vertebral height (VH). All were neurologically intact preoperative. The mean age was 42.5 years (range 15-66). The mean follow-up was 16 months (12-36). SURGICAL REDUCTION: Monoaxial bicortical pedicle screws were used at the upper and lower ends. Polyaxial screws were inserted to the fractured vertebrae. Then two rods given 40-50 degrees of lordosis were locked to the upper pedicle screws first then two in-situ benders were used to cantilever the rod into the lower end pedicle screws. After locking of the lower screws, the screws in the middle were locked.

Results:

Significant improvements were seen in LK, SI and VH in the postoperative period and this was maintained in the last follow-up. The mean improvement in VH and LK were 82% and 10.1 degrees respectively. The mean duration of hospital stay was 3.7 days (2-6 days). Preoperative/postoperative/last follow-up LK was 9.04°,5.8°,1.15°, and SI was 11.47°,1°,1.35°and VH was 38%,3%,2.7%.

Conclusion:

The new reduction technique when combined with posterior short segment fixation yielded excellent restoration of the anatomy in typeA3 fractures which was maintained in time.

S-16 MODIFIED POSTERIOR VERTEBRAL COLUMN RESECTION FOR THE TREATMENT OF VERTEBRAL INFECTIONS IN ELDERLY PATIENTS

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Background & Aims:

We aimed to present results of modified posterior vertebral column resection for vertebral osteomyelitis in elderly patients with pulmonary comorbidity as an alternative to combined anterior-posterior surgery.

Methods:

Sixteen elderly patients (10 females and 6 males with an average age of 73.8 [range; 68 to 83] years at the time of operation) with pulmonary comorbidity were included. Etiologic diagnoses were spinal tuberculosis in 8 patients and nonspecific spondylodiscitis in 8 patients. Surgical technique included placement of cement augmented titanium pedicle screws, followed by hemilaminectomy, unilateral pediclectomy from the mostly involved site by the abscess, sacrifice of nerve root between Th2 and Th11, decompression of spinal canal by doing subtotal vertebrectomy and adjacent discs and anterior column support by titanium mesh. One level above and one level below prophylactic vertebroplasty were performed. Contralateral posterior elements were preserved for fusion.

Results:

There were; 3 single level, 12 two level and 1 four level resections. The mean operation time was 8 hours and the average blood loss was 950 ml. The average number of instrumentation level was 7.5. One patient died at postoperative day 3 due to cardiac failure. Average follow-up for the remaining patients was 36 (24 to 68) months. The mean preoperative local kyphosis angle was 29.5 degrees; it was improved to 7.2 degrees at the early postoperative period and it was maintained at 8.1 degrees at the latest follow-up. Ten patients with partial neurologic deficit (9 ASIA D and 1 ASIA C) had significant improvement (ASIA E). The major complications were postoperative deep infection in one and cardiac failure in one patient (12.5%). The minor complications were hematoma in two patients responded well to debridement surgery (12.5%). None of the remaining patients required revision surgery for recurrence of infection or implant failure or pseudoarthrosis.

Conclusion:

As an alternative to anterior or combined anteriorposterior approaches, this study showed that radical debridement and anterior support can be provided by modified posterior vertebral column resection in elderly. Preservation of contralateral posterior elements might have helped to obtain higher fusion rates so that 270 degrees fusion is provided.

S-17 MODIFIED POSTERIOR VERTEBRAL COLUMN RESECTION FOR THE TREATMENT OF OSTEOPOROTIC FRACTURES WITH NEUROLOGICAL DEFICIT IN ELDERLY PATIENTS

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Background & Aims:

Purpose of this retrospective study was to evaluate the results of spinal canal decompression and anterior column support via modified PVCR in elderly patients having osteoporotic vertebral fractures with neurological deficit by eliminating disadvantages of anterior approach.

Methods:

Thirty-three consecutive patients (28 female and 5 male) with more than 2 years follow-up were included. Fractures were at thoracic in 11 and thoracolumbar spine in 22 patients. Nine patients had ASIA C and 24 patients had ASIA D neurological deficit. Radiographic analysis included Local kyphosis angle (LKA). Clinical outcome and complications were also evaluated. Surgical technique included placement of cement augmented pedicle screws, followed by hemilaminectomy, unilateral pediculectomy, sacrifice of nerve root between Th2 and Th11, decompression of spinal canal by doing subtotal vertebrectomy and adjacent discs and anterior column support by titanium mesh. Contralateral posterior elements were preserved for fusion. One level above and one level below prophylactic vertebroplasty were performed in all patients.

Results:

Av. age was 71.5 (56-88) years and follow-up was 55.5 months (24-96). Av. level of instrumentation was 5.6 (4-8), operation time was 400 (180-600) minutes and blood loss was 640 (450-800) ml. Av. preoperative LKA of 16.5 degrees improved to 3.2 degrees postoperatively and was 3.7 degrees at last follow-up. Preoperative VAS of 8 was 2 postoperatively and 3 at final follow-up. Full neurologic recovery was achieved in all patients. There was no pseudoarthrosis. The major complication was adjacent segment fracture requiring revision (3%). The minor complications were superficial wound infection in 2 patients (6%) and dural tear in one patient (3%). The overall complication rate was 12%.

Conclusion:

Decompression of the spinal canal and reconstruction of anterior column via a posterior approach provided satisfactory results in osteoporotic elderly patients. This procedure obviated the need for anterior approach which might have caused significant morbidity in these elderly patients. Preservation of contralateral posterior elements (lamina, pedicle, facet joints) might have helped to obtain higher fusion rates so that 270 degrees fusion is provided.

S-18 CORELATION OF 3D COMPUTERIZED TOMOGRAPHY MORPHOMETRIC ANALYSIS OF LOMBER SPINE WITH GENDER, AGE AND HEIGHT IN TURKISH POPULATION

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Background & Aims:

Objective of this study was to perform morphometric measures (transverse pedicle diameter (TPD), transverse pedicle angle (TPA), sagittal pedicle diameter (SPD), pedicle axis length (PAL), interpedicular widening (IPW) and spinal canal sagittal diameter (SCSD)) of vertebrae between Lumbar1 and Lumbar 5 through 3D Computed Tomography (CT) and to evaluate the correlation of these measurements with gender, age and height. Thus, we aimed to investigate the impacts of human body measurement on spinal morphology as well as to put forward Turkish population-specific values and investigate the degree of compliance of the implants we currently use in our society.

Methods:

A total of 240 cases undergone 3D CT examination due to any reason in Selcuk University Rediology Department, CT unit and had not any spinal pathology between January 2008 and January 2012 and were included in the study. The patients were divided into 4 groups as 20-29, 30-39, 40-49 and 50-59 age ranges with each group included 30 female and 30 male patients, into 4 groups according to the height intervals (150-159, 160-169, 170-179 ve 179<.. cm) and into 2 groups as male and female groups. Morphometric measurements between L1-L5 vertebrae were carried out, and the correlations were evaluated between the groups. Examinations were performed with the patients had not any pathology and history of trauma or surgery among all the patients undergone routine abdominal CT.

Results:

Total 240 cases included in the study were divided into two groups as 120 males and 120 females. Morphometric measurement carried out between L1 and L5 vertebrae were compared between two groups. Statistically significant differences were found in TPD, SPD and PAL at all the levels and in IPW at the levels of L1, L2 and L3, and in SCSD at L5 level ($p < 0.05$), with these values were higher in the males. No statistically significant difference was found in TPA at all the levels. The patients were divided into 4 groups of 60 cases according to the age ranges of 20-29, 30-39, 40-49 and 50-59 with each group included 30 male and 30 female patients. Morphometric measurements performed between L1 and L5 vertebrae were compared between 4 groups. Statistically significant differences were found in SPD, SCSD, IPW and PAL at all the levels, in TPD at the levels of L4 and L5, and in TPA at the levels of L2 and L5 ($p < 0.05$). The patients included in the study were divided into 4 groups according to the height intervals as 150-159 (n:41), 160-169 (n:94), 170-179 (n:73) and 179 < cm. (n:32). Morphometric measurements performed between L1 and L5 vertebrae were compared between 4 groups. Statistically significant differences were found in TPD and PAL values at all the levels, and in SPD and IPW values at all the levels except L5 ($p < 0.05$). Whereas significant different was found in SCSD values only at the L5 level. No statistically significant difference was defined in TPA values.

Conclusion:

Morphometric parameters of the lumbar region are similar in the Turkish and Western populations. In addition, these parameters differ according to gender, age and height. Gender, age and height of the patients should be considered preoperation in order to select the implant with a proper size and to prevent the adverse complications. The patients should be evaluated with the CT images in case of necessity.

S-19 CLINICAL AND RADIOLOGICAL OUTCOME OF THORACOLUMBAR FRACTURES TREATED BY OPEN AND MINIMALLY INVASIVE POSTERIOR SPINAL STABILIZATION-A SHORT TERM STUDY

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Background & Aims:

A retrospective comparative study to assess the clinical and radiological outcome of thoracic and lumbar spine fractures treated by open and minimally invasive percutaneous posterior spinal stabilization.

Methods:

study was conducted on 89 patients from 2002 to 2012 at ramachandra university hospital inwhich 49 were treated by open and 40 patients by minimally invasive method.patients who sustained trauma were included and those with osteoporotic,pathological fractures were excluded.both genders were included.pre and post op visual analogue pain score,intraoperative blood loss,duartion of surgery,mobilization and length of stay in the hospital,post op gain in kyphotic angle and loss of correction at final followup were observed.

Results:

the loss at final followup was abt 0.5 degreeES,average time of surgery was 90 minutes,average blood loss was 85 ml,post op pain score was 0.5,average stay at the hospital was 2.5 days and mobilized on the 1st day with MISS and loss at final followup was 7.1 degrees,average time of surgery was 100 minutes,average blood loss was 275ml,post op pain score of 2.5,usually mobilized on 3rd day ,average stay at the hospital was 6 days with open posterior method.

Conclusion:

minimally invasive group showed much better results with intra op blood loss,early mobilization of the patient,reduced hospital stay and in loss of correction at final followup.

S-20 THE EFFECTS OF DIFUMARATE SALT S-15176 IN SPINAL CORD INJURY

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Background & Aims:

Traumatic spinal cord injury (SCI) represents a serious medical and scientific challenge. In the present study, we analyzed the neuroprotective effect of difumarate salt S-15176, as an anti-ischemic, an antioxidant and a stabilizer of mitochondrial membrane in secondary damage following SCI in a rat model.

Methods:

Three groups were performed with 30 Wistar rats; control(1), trauma(2), and a trauma+difumarate salt S-15176 (10mg/kg i.p., DMSO) treatment(3). SCI was performed at the thoracic level using the weight-drop technique. Spinal cord tissues were collected following intracardiac perfusion in 3rd and 7th days of posttrauma. Hematoxylin+Eosin and Cresyl Echt Violet staining for histopatology, TUNEL assay for apoptotic cells and immunohistochemistry for proapoptotic cytochrome-c and Bax were performed to all groups. Following SCI, functional recovery test were applied to each group in 3rd and 7th days. The functional evaluations were done using the inclined-plane technique and a modified Tarlov motor grading scale.

Results:

In trauma group, the number of apoptotic cells was significantly higher ($p<0.05$) than control group. In the treatment group, apoptotic cell number in 3rd and 7th days (respectively $p<0.05$, $p<0.01$), also cytochrome-c ($p<0.05$) and Bax (respectively $p<0.05$, $p<0.01$) immunoreactive cells were significantly decreased in number compare to 7th days of trauma group. Motor scale results of the locomotor test were significantly increased in treatment group ($p<0.05$) compared to trauma group.

Conclusion:

We suggest that difumarate salt S-15176 prevents mitochondrial pathways of apoptosis and protects spinal cord from severe secondary tissue injury and helps to preserve motor function following SCI in rats.

S-21 SPINAL METASTATIC DISEASE; SURVIVAL ANALYSIS OF 146 PATIENTS AND EVALUATION OF FOUR DIFFERENT PREOPERATIVE SCORING SYSTEMS

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Background & Aims:

The authors aimed to show the predictive value of the scoring system of Bauer modified, Tomita, Tokuhashi revised and van der Linden as well as the parameters included in these systems.

Methods:

Retrospectively 146 patients with spinal metastasis were investigated between 2002-2011. Factors related to survival, including primary tumor, age, pathologic fracture, neurologic deficit, visceral metastasis, diagnosis of primary tumor and its spinal metastasis interval, other skeletal metastasis and undergone spinal surgery were analyzed. Patients were also scored by four different scoring systems. The survival period was calculated from date of diagnosis of the spinal metastasis to date of death or last follow-up (minimum 12 months). For statistical analysis Cox regression and Cronbach alpha tests were performed.

Results:

Median overall survival for all patients was 13 months (1-68). The primary tumor ($p=0,015$), existence of visceral metastasis ($p=0,017$), presence of pathologic fracture ($p=0,009$) and undergone spinal surgery ($p=0,047$) showed significant influence on survival. Each scoring system was reliable and concordant with the other scoring systems (cronbach's $\alpha= \%80$); however, after two years, Modified Bauer score appeared to be the most reliable system for predicting survival (cronbach's $\alpha= \%25$).

Conclusion:

According to this analysis, all four scoring systems were reliable for predicting survival of patients with spinal metastatic disease.

S-22 SURGICAL TREATMENT OF TUBERCULOUS SPONDYLITIS

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Background & Aims:

There is consensus on medical management of tuberculous spondylitis (TBS); however, literature is quite divided on surgical management of TBS. We aimed to illustrate surgical indications and treatment modalities for TBS in the management of selected patients.

Methods:

A total of 19 patients with different vertebral tuberculosis were treated with surgical intervention. There were 10 male and 9 female patients, mean age was 48 ± 18.1 years and mean follow-up time was 59.9 ± 27.7 months. There was average 1.2 ± 0.5 disc and 2.2 ± 0.5 vertebral body involvement.

Results:

15 cases were surgically debrided through anterior approach, 4 were surgically debrided through posterior approach, 1 patient treated with anterior screw fixation and 17 patients treated with posterior pedicle screw fixations. Mean corpectomy level was 1.7 ± 1.2 and mean fusion level was 6.8 ± 3.8 . Postoperatively, 4 patients had suffered from complications which were significantly higher in cases with more intervertebral disc involvement ($p=0.005$), with more vertebral body involvement ($p=0.033$), with more number of corpectomies ($p=0.003$) and with more fusion levels ($p=0.023$).

Conclusion:

Debridement should be performed in cases of neurological impairment, multilevel involvement or severe abscess formation. Posterior instrumentation should be added to prevent anterior implant failure in multilevel involvement.

S-23 THE ROLE OF PELVIC ASYMMETRY IN THE AETIOLOGY OF ADOLESCENT IDIOPATHIC LUMBAR SCOLIOSIS

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Background & Aims:

Sacral tilt and Lumbar curve relationship has been considered as an adaptive change of Sacrum to increased stresses in this region due to the asymmetrical loading. There are sporadic investigations that stress the importance of sacrum in lumbar curves. The aim of this study is to determinate the relationship between pelvic asymmetry and sacral tilt with lumbar scoliosis.

Methods:

Measurements were done on control (3-18 years) (CG) and scoliotic (SG) subjects: Iliac wing (IW) height, acetabular roof to upper most level of iliac wing, Cobb angles, L4 tilt, sacral tilt. In CG 700 child pelvis X-Rays were analysed. 89 pelvis X-Rays without any deformity, congenital disease and reference points clearly visible were included. All pelvic X-rays with suspected rotation (midsacral line to teardrop distance ratio $> 1,05$ or $< 0,95$) were excluded. Age and gender matched groups were set. There were 40 girls in SG group and 40 girls in CG. All variables were recorded as concave/convex iliac. For CG left side was accepted as convex. Concave/convex ratio was used for correlation analysis. Ratios, sacral tilt, L4 tilt; Cobb measurements on SG and CG were used in statistical analysis. Pearson correlation analysis, Chi-Square Student t test were used where appropriate.

Results:

Intraobserver error was 0,999 $P < 0,01$ and 0,855 $P < 0,01$ (Cronbach alfa) on iliac wing height and L4 tilt measurements. Significant correlation in Cobb and L4 tilt in SG (0,579; $P < 0,01$). and moderate correlation between L4 tilt and ratio of height from ischiadic tubercle to tip of iliac wing (0,332; $P < 0,05$), but no correlation in CG (0,020; $P = 0,902$). There was a moderate correlation between L4 tilt and ratio of height from acetabular roof to tip of iliac wing (0,478; $P < 0,05$) but no correlation in CG (0,034; $P = 0,83$). There was a moderate correlation between sacral tilt and ratio of height from acetabular roof to tip of iliac wing (0,459; $P < 0,05$) in SG, but a weak correlation on CG (0,197; $P = 0,222$).

Conclusion:

Our study demonstrated that sacral tilt and iliac wing convex/concave ratios are moderately correlated. Sacral tilt could be an adaptive change due to the scoliotic curve however it is unlikely that whole pelvis is affected by lumbar scoliosis. Could pelvic asymmetry be affecting sacrum and resulting sacral tilt be the cause of lumbar scoliosis?

S-24 DOES ALL SEGMENT IMPLANTATION CAUSE MORE CORRECTION OF LENKE 1 ADOLESCENT IDIOPATHIC SCOLIOSIS

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Background & Aims:

There is limited studies investigating whether bilateral pedicle screw placement improves correction of deformity compared to alternate segmental fixation in AIS. Radiological evaluation of AIS is not limited only with Cobb angle. T1 tilt angle clavicle angle, apical vertebral translation, trunk shift are parameters evaluating coronal balance in AIS. This study evaluates sagittal parameters of posterior only instrumented Lenke Type 1 AIS patients between bilateral segmental fixation group and alternate segmental fixation groups.

Methods:

49 consecutive patients (7 males, 42 females) with Lenke Type 1 adolescent idiopathic scoliosis patients who underwent single stage posterior only instrumentation and spinal fusion at a single center were retrospectively evaluated. Coronal radiographic analyses include Cobb angles, apical vertebral translation (AVT), coronal balance (CB), T1 tilt angles (T1A), clavicle angles (CA), and trunk shift (TS). Standing whole spine anteroposterior radiographs before the surgery and at last follow up were evaluated.

Results:

Surgeries of 23 patients were bilateral segmental fixation, and of 26 patients were alternate fixation. Groups were similar according to all parameters before surgery. No statistical difference was found after surgery between groups.

Conclusion:

Bilateral segmental pedicle screw fixation did not improve curve correction compared with unilateral or alternate segmental fixation.

S-25 DUAL GROWING ROD TECHNIQUE IN EARLY ONSET SCOLIOSIS: IMPLANT-RELATED COMPLICATIONS

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Background & Aims:

This study was performed to evaluate patients treated with dual growing rod technique (Akbarnia's technique).

Methods:

A total of 7 consecutive patients (5 male, 2 female) were analyzed. We analyzed demographic and radiographic data including age, etiology, comorbidity, initial and follow-up Cobb angle, duration of follow-up, lengthening procedures per patient, complications (wound, implant, alignment and general surgical or medical).

Results:

The mean age at the initial surgery was 5 years (3-10). The duration of follow-up was 35 months (12-65 months). Etiologies were idiopathic in 3 patients, congenital kyphoscoliosis in 1 patient, neurofibromatosis (NF) type 1 in 1 patient, neuromuscular in 1 patient and spondyloepiphyseal dysplasia in 1 patient. Comorbidities were heart problem (bicuspid valve), ear anomaly, cross-eye (oculomotor apraxia), psychiatric problem, tethered cord, diastematomyelia, mental-motor retardation, pes carinatum and deafness. Average initial and last follow-up curve magnitudes were 79.6 degrees (60-105) and 55 degrees (30-65) respectively. Instrumented vertebra levels per patients was 13,85 (12-15), surgical procedures per patient was 3,5 (2-6), lengthening procedures per patient was 2,5 (1-5), duration between growing-rod lengthening procedures 6,2 months (6-7,2), unplanned surgical procedures in 3 patients, no patient with final fusion, complications were in 3 patients (42%). Proximal pedicle screw loosening in two patients, implant failure in NF patient changed the treatment to anterior-posterior convex hemiepiphysiodesis. No medical complications reported. Dual growing rod technique was successful in 6 patients (86%).

Conclusion:

Dual growing rod technique is safe and effective treatment technique in selected EOS patients with spinal deformities. Dual rods are stronger than single rods and therefore provide better initial correction and maintenance of correction with less implant-related complications.

S-26 APICAL SHORT-SEGMENT CORRECTION IN ADOLESCENT IDIOPATHIC SCOLIOSIS: A MULTICENTER STUDY OF A NEW INNOVATIVE POSTERIOR TECHNIQUE

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Background & Aims:

Posterior correction that requires less fusion would present an advance compared to current surgical techniques used for adolescent idiopathic scoliosis. We report early results from a multi-center clinical study of a new technology that employs apical short-segment correction and results in less fusion levels.

Methods:

AIS patients with Lenke type 1A or 1B and between 40-80° curves were included. The technology corrects and stabilizes spinal deformity by utilizing proprietary transverse couplers at the apex and pivoting connectors at select vertebrae proximal and distal to the apex. Once satisfactory correction was achieved, the corrected apical region was held in place with locking connectors. A stabilizing rod spanned the entire length of the instrumented region. Only select levels were stabilized to promote fusion.

Results:

Twenty female patients across 4 sites underwent the surgery. Average age was 14Y,1M Sanders score was 5.7, Risser score was 3.3. A mean of 10.5 levels were stabilized. Only 5.0(4 – 6) levels were fused representing 47.8%(40% – 60%) of the stabilized region. Cobb angle improved from 56.0(42 – 78)° pre-op to 17.4(5 – 29)° post-op resulting in a 68%(44% - 90%) improvement.

Conclusion:

This effective and novel posterior technique for the treatment AIS demonstrated deformity correction while requiring less fusion. While longer follow-up is required to determine if these results are sustainable, the early results of this study demonstrate deformity correction similar to traditional methods. However, less fusion presents a potential for spinal growth and enhanced mobility.

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Background & Aims:

Computer-assisted surgical planning for the sagittal plane deformities allows for operative maneuvers to be simulated on a computer before their application in the operating room. Image guided surgical planning of a deformity improves surgical accuracy and can help translating a virtual surgical plan to a real operation.

Methods:

We used Surgimap Spine program to determine the optimal corrective osteotomy for 5 sagittal plane deformity patient. The program guide us planning the osteotomy level, number and the osteotomy type (Smith-Petersen or Pedicul Substraction).

Results:

After virtual osteotomy, the surgical plan was translated into the operating room and the osteotomy and instrumentation was safely performed resulting in improved sagittal alignment

Conclusion:

We advocate that application of virtual surgical planning can improve the safety and accuracy of complex spinal deformity corrections.

S-28 SURGERY FOR ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS): TWO STEPS FORWARD ONE STEP BACK FOR CORONAL PLANE CORRECTION

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Background & Aims:

Surgery remains to be the gold standard in the treatment of AIS with curves over a certain magnitude. This study aimed to analyze the results of controlled trials (CT) on surgical treatment of AIS published over 30 years, and compare the results of these CTs with each other for coronal correction.

Methods:

With literature search initially 8355 articles, 775 abstracts were screened, and 79 articles were retrieved in full; and only 19 studies found to be of adequate standards. For these studies systematic review was performed comparing the results of systems .

Results:

See Table 1 and Figure 1 for details of analysis. It was seen that the average correction in the frontal plane improved gradually from 38.3% in Harrington instrumentation to 59.9% in all screw systems. Likewise, loss of correction from post-op to the end of follow up has improved from 19.4% for Harrington to 3.2% for all screw systems. Although all screw systems' overall correction rates was similar from the beginning of the usage of these systems , interestingly, for CD or similar and hybrid systems, the overall correction rates were much higher when the system was compared to the existing standard (Harrington for CD and like and CD and like for hybrid)

Conclusion:

These findings suggest that there was a gradual improvement in coronal correction and its' maintenance over 30 years. However, except all screw systems, there may be a positive bias for new systems as they are introduced or a negative bias for systems that are compared as standards of the day.

S-29 CONVEX INSTRUMENTED HEMIEPIPHYSIODESIS WITH CONCAVE DISTRACTION: A NEW TREATMENT MODALITY FOR LONG SWEEPING CONGENITAL CURVES

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Background & Aims:

The convex growth arrest (CGA) procedure has been well accepted for treatment of congenital scoliosis as it is a simpler procedure with successful results. However, unpredictability of curve behavior, slow and usually inadequate correction, and necessity of anterior surgery for completeness of the epiphysiodesis are its shortcomings. The purpose of this study was to report the results and complications of an instrumented convex growth arrest procedure modified with concave distraction.

Methods:

We retrospectively reviewed 11 patients with long sweeping congenital curves who underwent the procedure. Convex instrumented hemiepiphiodesis with pedicle screws was applied to the anomalous segments, and a concave distraction rod was added spanning the whole deformity. Mean age at index operation was 58 months (29-101 months). The patients underwent concave distractions every 6 months. The magnitude of coronal and sagittal deformity and T1-T12 height were measured on the pre-operative, immediate post-operative and most recent follow-up radiographs. Average follow-up was 31 months.

Results:

In the coronal plane, the convex hemiepiphiodesis segment was corrected from an average of 60.5 degrees to 40.4 postoperatively and was further improved to 27.6 at the latest follow-up. The distracted segment was corrected from 33.4 degrees to 15.2 postoperatively and to 14.7 at the latest follow-up. Sagittal plane alignment was minimally affected from the procedure. The average T1-T12 height was 158.1mm in the early postoperative period and 171mm at last follow-up. During follow-up we identified partial pull-out of screws on the distraction side in 5 of the eleven patients and rod breakages in 3 patients. These were revised at the time of planned lengthenings. There were no unplanned surgeries, deep wound infections nor neurologic complications.

Conclusion:

Convex instrumented hemiepiphiodesis with concave distraction resulted in good curve correction while maintaining the growth of thorax. The correction of the anomalous segment improved over time, proving the effectiveness of the hemiepiphiodesis. We believe that concave distraction enhances the growth of the anomalous segment, thereby augmenting the hemiepiphiodesis effect.

S-30 DETERMINATION OF THE LOWEST INSTRUMENTED VERTEBRA ON TREATMENT OF SCHEURMAN KYPHOSIS

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Background & Aims:

To determine the appropriate distal fusion level for thoracic scheurman kyphosis and correlation with the sagittal stable vertebra (SSV), and first lordotic vertebra

Methods:

From 1998 to 2010, 21 patients with mean 8 (3-12) years follow-up who underwent posterior instrumentation and fusion for thoracic hyper kyphosis were included study. There were 12 male and 9 female with mean age was 19 (15-29) years. Pedicle screws were used for posterior stabilization and allograft was used for fusion. Anteroposterior and lateral orthoröntgenogram performed for preop and follow up radiological examination. SSV, first lordotic vertebra, LIV were evaluated on Xray retrospectively. SSV was defined as the most proximal vertebra touched by posterior sacral vertical line (PSVL) and first lordotic vertebra was defined as just caudal to the first lordotic disc space. At the latest follow-up, junctional distal kyphosis were evaluated on Xray.

Results:

Distal junctional kyphosis was determined at eight patient. Two patient have symptomatic distal junction kyphosis revised and distal fusion level was lengthened with secondary surgery. At 11 patients LIV and SSV was the same vertebra and at follow up that patients have no distal junctional kyphosis. At 10 patients LIV was above the sagittal stable vertebra that determined with radiologically. There was statistically distal junctional kyphosis rate significantly higher where LIV was above the SSV (p<0.05).

Conclusion:

Patients that LIV was not correlated with SSV have high risk for distal junctional kyphosis. LIV and SSV correlation was important to prevent distal junctional kyphosis.

S-31 FEMORAL STRUT ALLOGRAFTS HELP TO CLOSE LAMINECTOMY DEFECTS AND PREVENT IT'S POTENTIAL COMPLICATIONS

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MERIC ENERCAN, _____

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Background & Aims:

Potential complications due to wide laminectomy defects are risk of hematoma, scar tissue formation causing neurological problems and instability. In our practice we use femoral strut allografts (FSA) to cover wide laminectomy defects to avoid related complications. Aim of current retrospective study was to analyze whether femoral strut allografts closing laminectomy defect fuse to host bone and prevent potential complications.

Methods:

33 pts (19F,14M), av age 35 yrs. (5-70) with min 1 year f/up were included. Surgical technique included preparation and placement of "H-shaped fresh frozen FSA" over the laminectomy side in between adjacent intact spinous processes. Compression was performed via the pedicle screws to increase its stability after placement. Cross-bar(s) were placed over the strut graft to prevent its dislodgement. Local bone and allograft were placed around both ends of FSA to promote fusion (Figure 1). Preop and postop standing AP and lateral x-rays were measured for Cobb angles and 3D CT scan was performed after one year f/up in all pts to evaluate the integration of FSA. Hospital charts were reviewed in terms of complications.

Results:

Av f/up was 38 (12-74) months. Surgeries included PVCR (24), PSO (4) and only wide laminectomies for decompression (5). Av coronal and sagittal plane correction was 62,4% and 71,3% respectively and there was no significant correction loss in both planes at final f/up ($p>0.05$). Complete fusion of both ends of FSA was observed in 28 (84,84%), partial fusion of both ends was observed in 5 (15,15%) pts with 3D CT scan at the final f/up. There was no infection, breakage, migration, dislodgement or resorption of FSA, pseudoarthrosis of osteotomy site and implant failure. None of the pts had secondary surgical intervention due to hematoma formation or increased neurological compromise.

Conclusion:

Results of current study has demonstrated that FSA may help preventing wide laminectomy related complications. FSA may also provide structural support and act as a secondary stabilizator preventing mechanical failures.

S-32 AUGMENTATION OF PEDICLE SCREWS WITH CEMENT HELPS TO PREVENT MECHANICAL FAILURE IN ELDERLY PATIENTS WITH >5 LEVELS INSTRUMENTATION: A CT ANALYSIS OF 688 PEDICLE SCREWS

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Background & Aims:

Cement augmentation of pedicle screws (PS) is one of the several measures to prevent screw failure in elderly patients with osteoporosis. The aim of this study is to analyse the efficacy and complications of cement augmentation in elderly patients with long (>5 levels) instrumentation.

Methods:

A retrospective analysis of 55 patients who had cement augmented PS was performed. All patients had CT scans taken minimum 2 years after index operation. CT's were analysed to determine PS loosening, cement leakage and fusion rates at augmented levels. Standart vertebroplasty technique was used for augmentation. Prior to cement injection, mechanical aspiration of the vertebral bodies was done through working cannula to prevent cement emboli. Cement injected was 4cc/lumbar and 2cc/thoracic vertebrae. Screws were placed immediately after cement injection.

Results:

There were 688 cement augmented PS with a mean f/up of 45 (24-116) months. Average age (40 F, 15M) was 69 (50-85) years. Diagnosis were spinal stenosis in 41, trauma in 1, infection in 5 and revision surgeriy in 8 patients. Av. number cement-augmented screw/patient was 13 (4-32). Interbody fusion was done in 37 patients (100 levels). There were 10 (1.4%) loose screws in 7 (%12.7) patients. None had pulled out. Screw loosening was at fused levels in all except one with pseudoarthrosis. All loosed screws were at the levels without interbody fusion. One patient with pseudoarthrosis had rod breakage and underwent a revision operation. There was no vertebral body fracture at the augmented levels. Extravasation of cement was seen in 7 (%12.7) patients, none in spinal canal. 3 (%5.4) patients had asymptomatic pulmonary cement emboli. 3 (%5.4) patients had deep wound infection, they were treated successfully with debridement and antibiotic therapy with no need to instrument removal.

Conclusion:

Cement augmentation of PS in elderly osteoporotic patients prevents screw pull-out. Screw loosening can be seen with a very low rate and at the levels without interbody fusion.

S-33 PROPHYLACTIC VERTEBROPLASTY OF ADJACENT NON-FUSED SEGMENT(S). IT'S EFFECT ON ADJACENT DISCS AND THE INFLUENCE OF SAGITTAL MALALIGNMENT ON IT'S EFFICACY? AN MRI STUDY

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Background & Aims:

Prophylactic vertebroplasty (PV) has been used to prevent failure of non-fused adjacent segment (ASF) over the long-construct fusions in osteoporotic pts. However, there is a concern that PV may not be protective against ASF if there is sagittal malalignment after surgery. One other concern is the decreased nutrition of the disc below the augmented level due to cement in the vertebral body causing adjacent segment disc degeneration (ASD) and PJK. Aim of this study was to analyze the efficacy of PV, its effects on adjacent discs and the effect of residual sagittal plane (SP) malalignment on the success rate of PV.

Methods:

48 (35F, 13M) osteoporotic pts (av age 68 (52-85)) treated with min. 5 levels instrumentation and one or more levels PV with at least 2 years f/up (mean 42,5 (24-70 months)) were included. Amount injected cement was 2cc in upper thoracic and 3cc in lower thoracic spine. All pts had preop and f/up (>2 years) MRI's. All discs at PV levels were evaluated in terms of disc degeneration by using Phirmandjian classification. SP x-ray measurements were done to classify post-op and f/up SP alignment according to Schwab sagittal modifiers. PJK was determined as the Cobb measurement between the UIV and 2 levels above. All adjacent segments were analyzed to determine ASF.

Results:

Av instrumentation level was 7,35(5-16). Av level of PV was 1,25(1-3). PV was performed at upper thoracic spine (T2-5) in 3 and lower thoracic spine in 45 pts. 60% of pts had perfect SP alignment while 40% had abnormal SP alignment at f/up acc. to Schwab sagittal modifiers. PJK was observed in 10% of pts. ASD below the PV level was observed in 20% of pts. None of the patients had adjacent segment collapse/fracture. There was no correlation between the sagittal malalignment and adjacent segment degeneration, PJK ($P=0.476$) or ASF ($P=0.282$).

Conclusion:

PV is effective to prevent adjacent segment failure. Adjacent segment disc degeneration after PV below the PV level is comparable to adjacent segment disc degeneration incidence after long fusions with no PV. Less than optimal sagittal alignment has no negative effect on efficacy of PV.

S-34 RADIOLOGICAL AND CLINICAL OUTCOME OF THE OPERATED AND ADJACENT SEGMENTS FOLLOWING CERVICAL ARTHROPLASTY AFTER A MINIMUM 24-MONTH FOLLOW-UP: A SINGLE SURGEON-CENTER EXPERIENCE

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Background & Aims:

The purpose of this retrospective study was to determine the radiological outcome at the index and adjacent levels and clinical outcome of cervical total disc arthroplasty (TDA) after a minimum 24 months follow-up at a single center

Methods:

86 levels of 59 (28 F, 31M) cases with minimum 2 years f/up were included in this study. Younger patients with radicular pain, with no facet joint arthrosis and with preserved disc height >50% were selected for TDA. All patients had Prodisc-C as TDA. Radiological parameters including disc level height at the operated and adjacent levels, global cervical lordosis, segmental lordosis, range of motion, subsidence, facet arthrosis, adjacent segment degeneration (ASD) and heterotopic ossification were analysed. All surgeries were done by a single surgeon. All patients had prophylactic indomethacin for 6 weeks after surgery

Results:

Av. age was 39,5 (27-56) and av. f/up was 33,6 (24-81) month. Operated levels were C3-4 (%4,6), C4-5 (%16,3), C5-6 (%48,8), C6-7 (%26,8), C7-T1 (%3,5). All patients had clinical improvement. NDI was improved from 46 to 9. There was a significant improvement in segmental kyphosis, global lordosis and disc height at the operated level with no significant change at the final f/up(table 1). There was no radiographic facet joint arthrosis at the index and adjacent levels 4 (%6,7) patients had radiographic signs of ASD at the cranial adjacent level while 5 (%8,4) patients had ASD at the caudal adjacent level. Heterotopic ossification (HO) was observed in 4 patients (%6,7) with a complete fusion in one patient

Conclusion:

This study demonstrates a satisfactory radiographic and clinical outcome after TDA with a minimum 24-month follow-up

S-35 EFFECTS OF PLIF AND TLIF SURGERY ON RADIOLOGICAL PARAMETERS OF LUMBOSACRAL VERTEBRA IN DEGENERATIVE SPONDYLOLISTHESIS

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Background & Aims:

Posterior lumbar interbody fusion(PLIF) and transforaminal lumbar interbody fusion(TLIF) are both accepted surgical approaches for spinal fusion in degenerative spondylolisthesis. Both methods obtain solid interbody vertebral fusion through a posterior approach. Anterior column was reconstructed with interbody devices. The aim of this study is to observe the effects of TLIF and PLIF methods on radiological parameters of patients with degenerative spondylolisthesis and to identify the changes of lumbosacral anatomy.

Methods:

23 patients who were performed PLIF(11) or TLIF(12) operation for degenerative spondylolisthesis between 2006 and 2011 were included the study. The average of age was 51,9(35-76). Interbody fusion was achieved for double level in 8 and one level in 15 patients. Peek , metal or mesh cages were used as interbody device. Lumbar lateral standing x-rays are taken before and after the operation. Radiological parameters such as sliding grade, lumbar lordosis and sacral slope were recorded and compared the changes.

Results:

Both methods were successful in reduction of sliding grade(from 1,36 to 0,45 for PLIF and from 0,75 to 0,08 for TLIF). Average lumbar lordosis changed from 44,27 to 42,82 in PLIF and from 46,67 to 51,58 in TLIF. Average sacral slope changed from 29,00 to 27,55 in PLIF and from 36,92 to 39,92 in TLIF. TLIF increased lumbar lordosis and sacral slope more than PLIF.

Conclusion:

Anterior column restoration has favorable effect on sagittal balance. TLIF has more positive effects on radiological parameters predicting sagittal balance than PLIF.

S-36 BIOMECHANICAL COMPARISON OF DYNESYS AND COFLEX DYNAMIC STABILIZATION SYSTEMS ON RANGE OF MOTION AND LOADING CHARACTERISTICS OF LUMBAR SPINE : A FINITE ELEMENT STUDY

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Background & Aims:

Primary purpose of dynamic stabilization is to preserve the normal range of motion of the spine, and restrict the abnormal movement. To analyze the effect of two dynamic stabilization systems with the range of motion and disc loading characteristics of lumbar spine with finite element method (FEM) biomechanically.

Methods:

First three lumbar vertebrae (L3-L4-L5) were modeled by FEM. Then one Coflex Interspinous Device and one Dynesys Dynamic Stabilization System are modeled and implanted virtually at L4-L5 segment of lumbar vertebrae by FEM. Flexion, extension, bending and rotation forces are applied to this two models and to the intact vertebrae model that was accepted as control . Range of motion and disc loading forces at L4-L5 level were measured and compared in these three models virtually by FEM.

Results:

Both systems reduced range of motion and disc loading forces at implanted lumbar segment with one exception separately. These exceptions were occurred with Coflex interspinous device. It increased the range of motion by %19 and did not affect the disc loading force in flexion.

Conclusion:

We observed that Coflex device could prevent excessive disc loading while increasing range of motion abnormally in flexion. Both devices don't seem to be sufficient at motion preservation and load sharing in other directions of lumbar motion.

POSTER PRESENTATIONS

EP-1 THE PREVALENCE OF LUMBOSACRAL TRANSITIONAL VERTEBRA IN A WELL-REPRESENTED GENERAL POPULATION

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Introduction:

Lumbosacral transitional vertebra (LSTV) is a congenital vertebral anomaly of the L5–S1 junction. The prevalence studies are lacking. Our study aims to establish the prevalence rates for LSTV in the Turkish general population.

Method:

For this retrospective study, 6200 abdominal radiographs were collected over a one-year period. These were identified from four cities (İstanbul, Diyarbakır, Konya, Samsun) in different geographic regions. Inclusion criteria were subject's age older than 18 years at time of radiographs and abdominal radiographs available with clear visibility. A total of 3607 were identified as being suitable for measurement. Sacralization was classified according to the Castellvi radiographic classification system.

Findings:

A total of 1843 female and 1764 male subjects were identified. The average age was 39.5 years. Of these subjects, 683 were classified for LSTV, with a gender distribution of 314 (46%) women and 369 (54%) men, for a prevalence of 18.9%. A total of 623 subjects were classified for sacralization, with a gender distribution of 276 (44.5%) women and 344 (55.5%) men, for a prevalence of 17.2%. A total of 63 lumbarizations were classified, for a prevalence of 1.7%. Statistically significant differences were found between the two sex groups in subjects with LSTV ($p=0.002$) and sacralization ($p<0.001$). Statistically significantly higher incidences of Type I A and Type I B were found in men ($p=0.016$, $p<0.001$).

Conclusion:

Prevalence of LSTV retains its controversial status. Our prevalence study of the general Turkish population will provide assistance to resolve the controversy.

EP-2 THE EVALUATION OF THE EFFICACY AND SAFETY OF THE SURGICAL TREATMENT OF VERTEBRAL HEMANGIOMA INVADED TO THE SPINAL CHANNEL

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Introduction: We presented our experience in a patient, who underwent surgery, to evaluate the efficacy and safety of surgical treatment of vertebral hemangiomas which were seen in multiple vertebral bodies and caused neurological deficit.

Materials and Methods:

Sixty seven years old female patient, who was underwent the posterior surgery due to T12 vertebral compression fracture 5 years ago, and had urinary and fecal incontinence in last 4 weeks and low back pain, progressive weakness in lower extremities and disability during walking in last 4 months following asymptomatic 5 years, were evaluated.

In MRI screening, multiple vertebral hemangiomas were found at the levels of T7, T9, T10 and L4 and being invaded to the spinal channel at level of T10. Adamkiewicz artery and circulation of the spinal canal were assessed with vertebral angiography. After the selective spinal embolization, T10 corpectomy and the combined posterior-anterior-posterior surgery without rib resection, which was accompanied by neuromodulation, were performed for cord decompression. The radiotherapy was done after 4 weeks following the surgery. Video images were recorded before and after surgery and the modified SRS-30 questionnaire and the specific questions related to patient satisfaction were used for assessment.

Results:

There was significant difference in daily activities, self-image and pain control in SRS questionnaires performed in pre- and postoperative 1st, 4th, 8th and 12th weeks. The patient was neurologically stabilized and able to walk by himself during clinical observation. There were not any complication occurred during the surgery and any problems related to the wound healing and the implants during follow-up. The control MRI showed the complete resolution of the disease. The result was a successful. The clinical and neurological success was achieved.

Conclusion:

Vertebral hemangioma is a common benign tumor and usually asymptomatic. It can rarely cause the serious progressive cord compression. If the principles of multidisciplinary treatment were applied accurately, it can be treated safely with the surgery.

EP-3 COMPLICATIONS OF SURGICAL TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS: ONE SURGEON-ONE INSTITUTE EXPERIENCE OF 346 PATIENTS

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Background&Aims:

The Incidence of complications secondary to surgical treatment of adolescent Idiopathic scoliosis remains imprecise. The purpose of this study was to assess the incidence of intra- and postoperative complications secondary to this type of surgery in the perspective of one surgeon-one institute experience.

Methods:

For this study, we included 346 patients who underwent surgery between the years 2002 and 2012. Four main categories of complications were studied: general, infectious, neurological, and mechanical. Pre-, intra- and postoperative variables were recorded from clinical charts, radiological studies and operating theatre notes. All posterior surgeries were performed by segmental pedicle screw instrumentation (5.5 mm titanium) at every level with posterolateral fusion with freeze-dried spongy allograft with facet joint fusion and without lamina resection. Our analysis of data was a descriptive analysis to detail the overall incidence of complications and the incidence of each of the four main categories.

Results:

Mean age of the cohort was 14.29 (range; 11 to 18) years. An isolated posterior approach was used for 332 patients, an isolated anterior approach for 7 patients, and a combined anteroposterior approach for 7 patients. Nineteen patients had one or more complications (25 total complications) during or shortly after their operation. The general infections were hematoma in 6 (1.78%), paralytic ileus in 2 (0.58%), fever of unknown origin in 1 (0.29%) patients (the overall incidence of 2.6%). The infectious category was superficial infection in 7 (2.02%), deep infection requiring debridement surgery in 2 (0.58%) patients (the overall incidence of 2.6%). Mechanical complications were proximal junctional kyphosis in 3 (0.87%), pseudoarthrosis in 3 (0.87%) patients and adding on deformity requiring revision surgery in one patient (the overall incidence of 2.02%). There were no neurological complications except intraoperative decrease of neuromonitorization voltages in two patients who had positive wake-up test. The total complication rate was 7.22%.

Conclusion:

This clinical series of one surgeon-one institute has demonstrated that surgical treatment of AIS is safe and effective. Fusion rate is high by using allograft together with segmental pedicle screw instrumentation and facet fusion without lamina resection.

EP-4 FLUOROSCOPY FOR TRANSPEDICULAR SCREW PLACEMENT IN SCOLIOSIS: TO WHAT EXTENT CAN RADIATION EXPOSURE BE REDUCED BY THE FREEHAND TECHNIQUE?

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Background&Aims:

In spinal surgery, high doses of radiation are delivered during surgical procedures that require fluoroscopic control. The aim of this study was to determine the amount of radiation delivered from the fluoroscopic unit and also the factors to reduce the amount of radiation during the surgery of adolescent Idiopathic scoliosis patients

Methods:

In this retrospective study 21 patients with adolescent Idiopathic scoliosis treated by transpedicular screws between 2009 and 2012 were enrolled in the study. Dose Area Product (DAP) values, number of views obtained during screw placement and other data were retrieved from the medical records of the patients

Results:

The mean number of transpedicular screws used was 18. An average of 10.1 vertebrae were instrumented. The mean number of images obtained was 7.76. Mean fluoroscopy time was 7.95 seconds. The total mean DAP was 64.6 cGy.cm²

Conclusion:

The amount of ionizing radiation transmitted to the patient and the surgical team can be reduced by freehand insertion, confirmation of screw position by AP and lateral fluoroscopic views including more than one segment, the use of K-wires as a guide in spinal segments with abnormal pedicular anatomy and neuromonitorization of the patient during the surgical correction of adolescent Idiopathic scoliosis.

EP-5 COMPLICATIONS AND RISK FACTORS IN PATIENTS WITH AGE >50 AFTER SURGICAL TREATMENT WITH INSTRUMENTATION >5 LEVELS:A SINGLE SURGEON EXPERIENCE

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Background&Aims:

Aims were to evaluate relevance of patient's and surgical characteristics in development of postoperative complications following surgical treatment of pts over age 50 and with >5 levels of instrumentation and fusion.

Methods:

137 consecutive pts (93F and 44M), av age 67 years (50-85) were included. All procedures performed by single surgeon in a single center. Hospital charts were reviewed to analyze comorbidities, intraoperative blood loss, operative time, ICU stay, hospital stay, minor and major complications. ODI scores were used to assess preoperative and follow up outcomes.

Results:

Av f/up was 45 months (24-120). Etiologies were degenerative spinal stenosis (111), adult scoliosis (14), spondylodiscitis (8), and fracture (4). Sixty-six (48,1%) patients had at least 1 comorbidity. Av intraoperative blood loss was 2369 cc (200-8000). Av. number of instrumented levels/patient was 7,6 (5-16). 44 (32,1%) patients had operations more than 10 hours. Av. ICU stay was 1.82 (1-6) and hospital stay was 19,6 (6-47) days. 46 patients (33,5%) had at least 1 prior spinal surgery. Overall complication rate was 48,2% including 9,49% major (deep infection, pneumonia, pseudoarthrosis, vascular injury) and 38,7% minor complications (arrhythmia, dural tear, DVT, hematoma, wound detachment, gastrointestinal, urinary infection, screw loosening). 22 (16%) pts had re-interventions to treat complications. ODI improved from 51,2 to 26,7 (%52.1) ($p < 0.001$). Hypertension ($P = 0.001$), male gender ($P = 0.025$), obesity ($P = 0.02$) and revision surgery ($P = 0.001$) were risk factors for minor complications. Obesity ($P = 0.002$) was found to be a risk factor for major complications. Complications had no effects on ODI.

Conclusion:

There is a high complication rate after spinal operations with long (> 5 levels) instrumentation in elderly patients (>50 years). Obesity, hypertension, male gender and revision surgery are risk factors. However, the outcome improves significantly despite high complication rates.

EP-6 POSTERIOR VERTEBRAL COLUMN RESECTION FOR ADULT SPINAL DISORDERS: EFFICACY, COMPLICATIONS AND RISK FACTORS

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Background&Aims:

Aim is to analyze the results, complications and related risk factors of PVCR performed on a consecutive series of adult pts with spinal disorders.

Methods:

56 adult patients (27 f, 29 m) managed by PVCR having more than 2 years follow-up were included. Indications were scoliosis (9), acute fracture (15), posttraumatic kyphosis (8), kyphosis (9), PJK (7), spondylodiscitis (6), ankylosing spondylitis (2). Preop, postop and f/up X-Rays were evaluated to measure deformity, to reveal mechanical complications. Hospital charts were evaluated for medical complications. Risk factors and their correlation with complications were analyzed.

Results:

Av age was 45 (19 - 85) years at the time of the operation. Mean f/up was 4,6 (2-10) years. PVCR was performed at T level (23), TL level (29) and L level (4). Av. operation time was 441 (240-900) minutes and blood loss was 2452 (1000-6100) ml. Av instrumentation levels were 9 (4-18). Preop mean coronal plane curve was corrected from 87,6 degree (46-120) to 47,3 degree (5-77) (46%). Preoperative thoracic kyphosis was corrected from 65,1 degree (24-110) to 47,6 degree (29-84) (27%). There was no significant loss of correction at final f/up ($p > 0,05$). Overall complication rate was 55,4%, including 29 patients had 35 minor complications (51,8%) and 4 patients had 4 major complications (7,1%). Major complications were pneumonia (2), pulmonary embolism (1) and superior mesenteric artery syndrome (1). There was no neurological complication. Patient age, PVCR level, etiology and revision surgery were not associated with major complications ($p > 0,05$). Etiology (acute trauma) was associated with major complications ($p = 0,045$). Total and minor complications were found higher in males ($p = 0,014$, $p = 0,025$, respectively). Fusion was observed in all patients.

Conclusion:

PVCR provides satisfactory radiographic outcome for the treatment of complex spinal disorders. However, It is a technically demanding procedure with high complication rates (major: 7,1%, minor: 51,8%) and should be selected only when other alternatives are not appropriate.

EP-7 ANALYSIS OF THE EFFECT OF POSTERIOR PEDICLE SCREW-ONLY INSTRUMENTATION ON SAGITTAL BALANCE AND SPINOPELVIC PARAMETERS IN SCHEUERMANN'S KYPHOSIS

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Background&Aims:

The aim of this retrospective clinical study was to evaluate the effect of surgical treatment in Scheuermann's Kyphosis (SK) via posterior pedicle screw-only instrumentation on sagittal balance in relationship with spinopelvic parameters.

Methods:

Twenty-nine patients (25 male, 4 female, mean age at the operation: 20.5 years (range 14-36 years)) treated with posterior pedicle screw-only instrumentation for SK between 2006 and 2011 in our institute were retrospectively evaluated via the parameters on the radiographic charts including the cervical lordosis, thoracic kyphosis, lumbar lordosis, sagittal balance, pelvic tilt, sacral slope and pelvic incidence that were measured for the preoperative-postoperative and follow-up period. The data obtained from those periods underwent statistical analysis. Complications were also noted.

Results:

The mean follow-up was 41.8 months (range 24-90 months). There was statistically significant improvement in parameters including the global thoracic kyphosis, lumbar lordosis and pelvic tilt ($p < 0,05$). A statistically significant relation was detected between sacral slope and lumbar lordosis for both preoperative and follow-up periods ($p < 0,05$). Two patients with proximal junctional kyphosis and a patient with hemothorax were the complicated cases noted. No neurological deficits occurred in any of the patients.

Conclusion:

Current study supports the relationship between lumbar lordosis and sacral slope accordingly with the literature. The decrease in lumbar lordosis may be a contributing factor for the change in pelvic tilt due to the extension momentum in Scheuermann's Kyphosis.

EP-8 DUAL GROWING ROD TECHNIQUE IN THE MANAGEMENT OF EARLY ONSET SCOLIOSIS

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Background&Aims:

To investigate the safety and efficacy of dual growing rods for early onset scoliosis and its effects on spinal and lung growth

Methods:

Starting in July 2009, 27 patients (11 male, 16 female) were instrumented with the dual growing rod technique. Patients' diagnoses were 10 juvenile, 2 infantile idiopathic, 14 congenital and 1 neuromuscular scoliosis. Pedicle screws were used for fixation and routine lengthening procedures were performed every six months. Number of lengthenings, length of follow-up and complications were recorded. Cobb angle, kyphosis angle, T1-S1 length, space available for lung (SAL) ratio, coronal-sagittal balance and height were measured preinitially, postinitially, before and after every lengthenings.

Results:

The mean age was 5,9 years (1,3-10,9). Average follow-up time was 22,6 months (11-40). Average time between two lengthening were 6,6 months (5,6-10,8). The major Cobb angle improved from 50,60 (160-860) preinitially, 21,70 (00-460) postinitially, 16,90 (00-360) at the last follow-up ($p < 0,005$). Kyphosis angle was measured 46,10 (60-980) preinitially, 25,60 (60-660) postinitially ($p < 0,005$) and 26,20 (80-600) at the last follow-up. The mean T1-S1 length was 258,7mm (173-341) preinitially, 283,9mm (198-362) postinitially and 303,9mm (212-386) at the last follow-up ($p < 0,005$). The mean T1-S1 length increase was 2,39 cm/y. The SAL ratio increased from 0,893 preinitially, to 0,953 postinitially and to 0,979 at the last follow up ($p < 0,005$). No patient has undergone final fusion.

There were 6 (5,7 %) complications in 105 procedures: 2 superficial wound infection, 4 implant related. There were no neurological complications.

Conclusion:

The dual growing rod technique is safe and effective treatment for EOS. Using pedicle screws and routine lengthening performed every six months may decrease previously reported problems related to the implants.

EP-9 MODIFIED GROWING ROD TECHNIQUE FOR THE TREATMENT OF EARLY-ONSET IDIOPATHIC SCOLIOSIS

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Background&Aims:

This study introduces a new surgical strategy allowing spinal growth and lung development and controlling the apical rotation without fusion for the surgical treatment of early-onset idiopathic scoliosis.

Methods:

Between the years of 2007 and 2011, 16 children (7 males, 9 females; with a mean age of 5.5 years, ranging from 2-8 years) with progressive scoliosis (average 68 degrees) were included in the study. In the initial surgery; polyaxial pedicle screws were placed to the strategic vertebra (apical, end, intermediate and transitional zone vertebrae) after skin and subcutaneous tissue dissection without subperiosteal muscle dissection on midline. Then, rods were placed in situ after achieving correction with the help of manual traction (J-tongue from head and manual traction from lower extremities). The most proximal and most distal screws were fixed and the rest of the screws were left with nonlocked tap-screws. The lengthening re-operations were performed every 6 months. The patients were braced (TLSO) after surgeries. The coronal plane correction ratio, trunical height increase and complications were documented.

Results:

Initial curve correction went from 68 degrees (38-92) to an average of 20 degrees (4-36) and maintained at 22 degrees (4-36) at minimum two-year follow-up. Two of 16 patients underwent final permanent surgery after fifth lengthening surgery. In two of 16 patients, hybrid procedure was performed (apical vertebra resection + growing rod). The average number of lengthening operations was 5.5. The average coronal plane correction was 65% and average trunical height increase was 13%. The trunical height increase significantly reduced after fifth lengthening surgery. In the sagittal plane; decrease of thoracic kyphosis was not seen (preoperative and last follow up mean thoracic kyphosis were 23.4 and 22.6 degrees). No patient had significant changes in the spinal cord monitoring. There was no infection. In one patient, instrumentation was elongated distally due to adding on deformity. The dislodgement of set screw in apical foundation was seen in 9 patients but, none needed any intervention before planned lengthening surgeries.

Conclusion:

Our new treatment strategy provides that the screws in apical and intermediate vertebra controlled the curve, prevents progression, maintains rotational stability and allows continuation of trunk growth. This strategy can also provide that there is no need to develop special instrument designs and products in this technique.

EP-10 POSTOPERATIVE CEREBROSPINAL FLUID LEAK OF THE SPINE SURGERY: TREATED WITH EPIDURAL BLOOD PATCH

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Background&Aims:

A persistent cerebrospinal fluid leak after spinal surgery can be associated problematic postoperative events. Early active intervention is recommended with surgical exploration, lumbar subarachnoid drain, and less commonly epidural blood patch. We present 26 cases of successful treatment of dural leaks after spinal surgery using percutaneous blood patch.

Methods:

Twenty-six patients, after thoracic and lumbar spine surgery with instrumentation and primary closure was complicated by dural tears, developed severe symptomatic headaches and persistently drainage that failed conservative therapy. All patients underwent epidural blood patch. Patients have been evaluated clinically.

Results:

The average age was 43.9 years (range 5-72 years). Four patients had kyphoscoliosis and performed vertebral osteotomy and 22 patients had primary or revision lumbar spinal degenerative surgery. Average intervention time was 10,2 day (9-14). Forty-two blood patches were placed in 26 patients. Twenty-one (80,7 %) patients had symptomatic relief of their headaches and successful treatment of dural leaks. There were no neurological deficits. There were no early superficial or late deep infections.

Conclusion:

Percutaneous placement of blood patch may provide nonsurgical treatment for postoperative CSF leaks, potentially avoiding a major and technically difficult surgical procedure.

EP-11 HOW DOES SAGITTAL ALIGNMENT OF THE SPINE AND PELVIS AFFECT PATIENT OUTCOMES IN GROWING ROD SURGERY?

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Background&Aims:

The aim of the present study was to evaluate the effects of growing rod technique on sagittal balance and spinopelvic parameters for early onset scoliosis (EOS).

Methods:

Twenty-three patients with various etiologies (18 male, 5 female, mean age at the operation: 8.3 years) who underwent growing rod (8 single, 15 dual) for EOS between 2007 and 2011 in two different institutes were evaluated retrospectively. The parameters including the cervical lordosis, thoracic kyphosis, lumbar lordosis, sagittal balance, pelvic tilt, sacral slope and pelvic incidence on the radiographic charts were measured on the preoperative, initial postoperative and follow-up period. The data obtained from those periods were analyzed statistically. Complications were also noted.

Results:

The mean follow-up period was 34.2 months. The main global kyphosis angle (T1-T12) was 53.6° preoperatively, 39.6° initial postoperatively and 39.9° during the last follow-up postoperatively. The average pelvic incidence was established as preoperative 46.4°, initial postoperative 45.2°, last follow-up postoperative 45.7°. Complications affected 14 of the patients and consisted of eight rod fracture, seven screw pull-out, four hook dislodgement, three proximal junctional kyphosis, two screw nut loosening, one lamina fracture, one skin slough, one superficial wound infection and one deep wound infection, respectively.

Conclusion:

We found statistically significant improvement in global thoracic kyphosis angle between preoperative and initial postoperative values and also preoperative and last follow-up postoperative values ($p < 0.05$). There were no statistically significant improvement in sacropelvic parameters ($p > 0.05$). The treatment of EOS patient with growing rod technique doesn't provide statistically significant improvement for sagittal and sacropelvic parameters, except of kyphosis, during this follow-up period.

EP-12 EARLY RESULTS OF PATIENTS WHO HAD BEEN PERFORMED DIRECT LATERAL INTER-BODY FUSION

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Background&Aims:

With this study we aimed to discuss the early results of DLIF technique which is a new lumbar spinal fusion technique.

Methods:

Between November 2011 and December 2012 15 patients who had been performed DLIF due to degenerative scoliosis were assessed according to clinical and radiological datum. Clinically ODI and VAS scores and radiologically sagittal and vertical alignment of lumbar vertebrae were investigated.

Results:

With the mean follow up of 9 months retrospectively there was statistically meaningful results for back and leg VAS scores ($p < 0,001$). Again according to Cobb angle measurements at sagittal ($p < 0,01$) and frontal plane ($p < 0,001$) there were statistically meaningful results postoperatively.

Conclusion:

At patients with neurologic symptoms due to degenerative processes and who could not achieve a satisfactory response to conservative treatment, DLIF serves good results at deformity correction and symptom regression. At patients who have severe lumbar alignment pathologies, DLIF is a safe and preferable method for regaining the disk space and the physiological alignment.

EP-13 MINIMALLY INVASIVE TRANSMUSCULAR PEDICLE SCREW FIXATION OF THE THORACOLUMBAR SPINE FRACTURES

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Background&Aims:

Traumatic thoracolumbar fractures are among the most common spine injuries. Despite their commonality, management of unstable thoracolumbar fractures remains controversial. Conservative approaches namely bracing and/or bedrest are associated with continued pain, residual and possibly progressive kyphosis, and late neurological impairment. Operative approaches involve placement of short- or long-segment fusion as well as pedicle fixation to restore alignment and preserve neurological function. These interventions are not usually tolerated by older individuals with significant medical co-morbidities and patients who have suffered polytrauma. This limitation has led to the development of minimally invasive techniques, namely percutaneous pedicle screw fixation. Minimally invasive techniques have become increasingly popular in spinal surgery, especially the endoscopic or endoscopy-assisted anterior instrumentation, fusion, and reconstruction of thoracic and lumbar pathological features. For obvious reasons, posterior instrumentation of the thoracic and lumbar spine also is a target for minimal invasiveness. The standard open posterior approach to this region has distinct hypothetical disadvantages, that is, the necessary extensive dissection of the paraspinous muscles may be associated with a greater blood loss and may lead to persisting sequelae, such as muscular denervation, atrophy, and pain. In 1977, the technique of percutaneous pedicle screw placement was described by Magerl. It was used subsequently only for temporary external fixation, and the idea recently has been taken further to percutaneous internal fixation.

Methods:

From April 2011 through May 2012, 12 adult patients were enrolled in this study. There were 7 male and 5 female patients. The average age on admission was 54.1 years (ranged 37 to 81). The fracture levels were in Thoracic 12(T) 5 cases and were in Lumbar 1(L) 7 cases. Instable compression and burst fractures of thoracolumbar region which were operated by minimal invasive technique were enrolled in the study. The mechanism of injuries include, a fall from a height in 10 patients and motor vehicle accident in 2 patients (Table 1). Preoperative plain x-ray films including supine lateral and AP views were carried out to measure the sagittal spinal curve (Cobb angle) and the height of vertebral body (VBH); computerized tomography (CT) scans and reconstruction images to quantify the amount of comminuted fractured vertebral body and the apposition of the fracture fragments. We had CT image after the operation in order to evaluate screw position and fragments protruding in to the spinal canal in burst fractures. We classified screw position as good, acceptable and unacceptable. All patients were evaluated by MRI at the last controls. Paraspinal muscle atrophy, adjacent facet degeneration and spontaneous fusion were detected. A self-assessment questionnaire proposed by Prolo et al¹⁶ is used for assessment of functional outcome and pain in which a score of 5 is corresponding to normal daily activity and no pain; a score of 1 corresponding to being bedridden and in severe pain. Functional outcome was judged to be excellent when the function and pain score was 9 or 10; good, score of 7 or 8; fair, score of 5 or 6; poor, the score less than or equal to 4. Excellent and good scores were considered as a satisfactory clinical result, however, the fair and poor score accounted as an unsatisfactory results.

Results:

All patients were successfully managed with percutaneous minimal invasive procedures. The average operative time was 70 minutes (range 55 to 110min). The average intraoperative blood loss was 70mL (range 50 to 100mL). The hospital stay for the patients averaged 5,25 days (range 1 to 9 d). All patients were followed up and the period averaged 11.4months (range 5 to 20 mo). Based on self-assessment function and pain scores, all patients had a satisfactory result (10 excellent and 2 good). A total of 63 pedicle screws were placed in 32 vertebral bodies. According to the above-mentioned categories, position of the pedicle screws was judged to be good in 95,2% (n:60), acceptable in 3,2% (n :2), and unacceptable in 1,6% (n:1) (figure 1). We detected minimal paravertebral muscle atrophy and minimal fatty degeneration in two (16,2) patients. Adjacent facet degeneration and spontaneous fusion were not detected in any of the patients. All patients remained neurologically intact. No infection was developed. Screw head loosened in one patient and screw was replaced by another screw, no implant breakage occurred. In one patient, a pedicle fracture was occurred during rod fixation and were needed a longer segment implantation.

Conclusion:

Minimal invasive surgery avoids many of the problems encountered with classic posterior midline approaches, for instance, extensive soft tissue dissection, particularly with exposure lateral to the facet joints. Furthermore, increased intramuscular pressure and ischaemia caused by the retractors, resulting in iatrogenic muscle denervation and atrophy. Indeed, MRI investigations have well documented postoperative fibro-fatty degeneration of the paraspinal muscles with consequently unsatisfactory clinical results. Irreversible electrophysiological and histological changes in the paraspinal muscles are reported after invasive spine surgery in human and animal studies. Other factors are prolonged hospitalization, infection and blood loss. Against this background, percutaneous minimally invasive spine surgery might be the right concept, but there exists no standard surgical approaches or general recommendations for spine fracture management.

This study shows that percutaneous internal pedicle screw fixation using standard instruments is feasible and safe for posterior stabilization of the thoracolumbar spine fractures. We think that this technique may replace the standard open posterior approach in thoracolumbar vertebral fractures in the future because of less blood loss, less hospital duration and less operative time so we can expect less complications.

EP-14 PHYSICAL AND PSYCHOLOGICAL PERCEPTIONAL CHANGES IN PATIENTS WITH SCOLIOSIS WHO ARE TREATED BY SURGERY

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Background&Aims:

In this study we examined the physical and psychological changes in perception of their bodies after the surgical treatment of scoliosis.

Methods:

We evaluate the patients with age, sex, duration of follow-up, levels of instruments, preoperative and postoperative scoliosis angles, height and weight, body-cathexis scale, postoperative SF-36 scale and SRS-22 (scoliosis research society) scale (0:worst,5:best). Body-cathexis scale (40:best,100:worst) shows the satisfaction of the patient about the body. SF-36 (quality of life scale) (110:best,0:worst) is an one's own health assessment scale with prospectively. Statistical analysis was performed on dependent groups with student's t-test.

Results:

In this study we evaluate 29 patients who had surgery because of scoliosis between 2011-2012 years. Mean age 18 (11-34) and mean follow up 6,3 (2-5) months. Posterior instrumentation levels; eleven patients T3-L3, two L2-L4, one T2-T12, five T2-L2, five T4-L3, three T2-L3, one T11-L4, one T3-L2, mean preoperative scoliosis angle 51,37 degrees, mean postop kyphosis angle 4,84 (p:0,001). Preoperative mean body-cathexis scale is 87,06, postoperative mean body cathexis scale 69,31 (p:0,001). Preoperative mean body weight 54,17 kg, height 160,55cm and postoperative mean weight 56,06kg height 165,68cm. SF-36 score; postoperative average physical component is 48,27 and mental component score is 49,07. Postoperatively average SRS-22 score is: 4,36 point. When we look at the complications; back pain in 1 patients, 1 patient has pain in shoulder region and 1 patient has pain in lateral abdominal side.

Conclusion:

Scoliosis in patients who had surgery, serious cosmetic improvement is obtained and there is significant improvement in the perception of bodies of patients in physical and psychological ways.

EP-15 RETROSPECTIVE COHORT STUDY OF THE PREVALENCE OF LUMBOSACRAL TRANSITIONAL VERTEBRA IN A WIDE AND WELL-REPRESENTED POPULATION

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Background&Aims:

Lumbosacral transitional vertebra (LSTV) is a congenital vertebral anomaly of the L5-S1 junction in the spine. The prevalence studies with a wide participation of members are lacking. Our study aims to establish the prevalence rates for LSTV in the Turkish general population.

Methods:

This retrospective cohort study, 6200 abdominal radiographs were collected. These were identified from four cities in different geographic regions. Exclusion criteria consisted of any radiologic evidence of previous surgery that would block our view. A total of 3607 were identified as being suitable for measurement of the desired parameters. Sacralization was classified according to the Castellvi Radiographic Classification system. The prevalence of LSTV, sacralization, and lumbarization was reported.

Results:

A total of 1843 female and 1764 male subjects were identified; the average age was 39.5 years. 683 were classified as positive for LSTV, with 314 (46%) women and 369 (54%) men, for a prevalence of 18.9%. A total of 623 subjects were classified as positive for sacralization, for a prevalence of 17.2%. A total of 63 lumbarizations were classified, for a prevalence of 1.7%. Statistically significant differences were found between the two sex groups in subjects with LSTV ($p=0.002$) and sacralization ($p<0.001$). Higher incidences of Type A and Type B were found in men and these differences were statistically significant when compared with the women.

Conclusion:

Comparative studies can be carried out more easily once unanimous consensus for the prevalence of LSTV in the general population has been provided. Our prevalence study of the general Turkish population will provide assistance to resolve the controversy.

EP-16 CAN RIGHT-HANDED SURGEONS INSERT UPPER THORACIC PEDICLE SCREWS IN MUCH COMFORTABLE POSITION ?

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Background&Aims:

Upper thoracic pedicles are positioned in cranio-caudal plane. Manipulation of thoracic pedicle screws on the left side is difficult for right-handed surgeons. We recommend a new position to insert thoracic pedicle screw that will be much comfortable for spine surgeons.

Methods:

We retrospectively reviewed 15 patients who underwent upper thoracic pedicle screw instrumentation. A total of 110 thoracic pedicle screws were inserted to the upper thoracic spine (T1-6) by the same senior spine surgeons with the help of C-arm. Indications for thoracic spine surgery were metastatic or primary tumors ($n=3$), spinal infections ($n=3$) and spinal trauma ($n=9$). Screw containment was assessed by computed tomography scans.

Results:

Eighty-seven percent of the screws were completely within the pedicle (96 screws). Incorrect screw placement was found in 14 screws demonstrated by computed tomography scans (12,7%). The most frequent site of faulty screw placement was on the left side 10 screws (71%) and 4 (29%) screws on the right side (Table 1).

Conclusion:

The false upper thoracic pedicle screw placements are mostly on the left side for right-handed surgeons. Right-handed surgeons have difficulty to place upper thoracic pedicle screw on the left side. Changing the surgeon's position standing near to patient's head will provide much comfortable position to orient the cranio-caudal plane of the thoracic pedicles (Figure 1).

EP-17 THE EVOLUTION OF SAGITTAL ALIGNMENT OF THE SPINE ON SITTING POSITION DURING CHILDHOOD

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Background&Aims:

In order to successfully plan sagittal reconstruction one needs to know the physiological values. Using measurements taken in the standing position as reference for the pre-operative planning of non-ambulatory patients can cause serious problems. Knowing the relationship between age and sagittal alignment in sitting child will allow precise patient-based preoperative planning. The purpose of this study is to describe the normative values of spinal sagittal alignment in the pediatric population, and document the evolution of sagittal alignment with growth in a sitting position.

Methods:

114 children (54F,60M) without musculoskeletal abnormality between the ages of 3 to 16 years were studied using 36-Inch sitting lateral radiographs. Children were grouped into four: Group I (3–6 years of age), II (7–9 years of age), III (10–12 years of age), and IV (13–16 years of age). A minimum of 7 (at least 3 from each sex) children were in each age group. Variables measured on the radiographs are: segmental angulations from T1–T2 to L5–S1, angles of global kyphosis (T1–T12) and lordosis (L1–S1), segmental angulations of T2–T5, T10–T12, T10–L2, and L4–S1 levels, sagittal vertebral axis and sacral slope.

Results:

Segmental measurements are shown in figure 1. One-way analysis of variance showed significant differences between the following parameters among groups: segmental angulations of T2–T5 ($P=0.017$), T5–T6 ($P=0.002$), L1–L2 ($P=0.011$), L4–S1 ($P<0.001$), L5–S1 ($P<0.001$), global lordosis angle ($P<0.001$), sacral slope ($P<0.001$). Global lordosis and global kyphosis angles were found to be lower in the sitting position compared to the standing position (1). Global lordosis, sacral slope and L5–S1 segmental angulations showed an increase whereas thoracic kyphosis showed a decrease in older age groups.

Conclusion:

Sagittal spinal alignment in the sitting position is different than that in the standing position and it changes as the child grows. There is a statistically significant difference between different age groups, especially at the cervicothoracic, thoracolumbar, and lumbosacral junctions. These findings should be taken into consideration for young non-ambulatory patients who require spinal instrumentation and/or fusion.

EP-18 SURGICAL MANAGEMENT OF THORACIC DISC HERNIATION. SINGLE SURGEON-SINGLE INSTITUTE EXPERIENCE

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Background&Aims:

Of all surgically treated disc herniations, thoracic disc herniation (TDH) represents only between 0.15% and 1.8% and there is lack of sufficient information on surgical treatment in the literature. The aim of this retrospective study was to analyze the results of 2 different surgical approaches for TDH

Methods:

20 pts. (8 male, 12 female, average age 56 (27-67) with a total of 27 levels TDH and treated surgically were included. All had myelopathy and/or radicular pain. 9 with 15 levels TDH underwent anterior transthoracic decompression and fusion (ATDF) and 11 with 12 levels TDH underwent posterior decompression and fusion (PDF) with transfacet approach

Results:

20 pts. had single, 5 had 2 and 2 patients had 3 levels TDH. 16 TDH were at T8 and below. 16 were paracentrally and 11 were centrally located. 8 were calcified. Average follow-up was 40 (12-113) months. All pts had successful resection of TDH. There were no significant differences between the 2 surgical groups in terms of preoperative VAS (8.3 vs. 8.43), Oswestry 41.6 vs. 43.36, JOA (7.5 vs. 7.45) myelopathy scores, amount of bleeding, hospitalization. The only significant difference at post-op period was in percentage improvement in JOA score (%51.77 vs. %69, $p=0.036$). One patient in ATDF group had no improvement in JOA score. 5 patients (55%) in ATDF (pulmonary (3), dural tear (1) and superficial infection (1)) and 2 (18%) patients in PDF (hematoma (1), deep wound infection (1)) groups had complications. None of the patients in each group had neurological compromise

Conclusion:

Patients with TDH and treated by PDF had better improvement percentages in myelopathy scores and had less complications when compared to patients treated by ATDF. Oswestry, VAS and global outcome scores on the other hand were similar

EP-19 DECOMPRESSION AND CORRECTION OF LUMBAR DEGENERATIVE SCOLIOSIS WITH ALL PEDICLE SCREW PLACEMENT: EARLY RESULTS

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Background&Aims:

Introduction: Degenerative scoliosis is a slow progressing type of scoliosis resulting from the disc and facet joint degeneration and is usually seen among adults aged ≥ 40 years. The surgical treatment of the degenerative scoliosis is an issue of debate. When patients are considered for surgical treatment, evaluation of existing comorbidities and the use of proper surgical technique are of crucial importance.

Methods:

18 patients who have undergone surgery for lumbar degenerative scoliosis between 2010 and 2012 have been evaluated retrospectively. Low back pain was the most common clinical complaint. All patients underwent bone densitometry measurement. For the patients with a T-score lower than -2.5, cement augmented pedicle screws were used. The patients were evaluated with Visual Analog Scale (VAS) and Oswestry Disability Index (ODI). For each patient, the Cobb angle was measured with a mean of 42 (22-65) degrees.

Results:

The mean follow-up time was 14.3(3-22) months, postoperative mean Cobb angle was 6 (0-15) degrees. Cement augmentation was used in seven patients. In 11 patients, distal screws were placed in pelvis. The mean VAS score was 7.8 (7-9) preoperatively, which decreased to 2.4 (0-4) postoperatively. The mean ODI score was 46% (35-64) preoperatively, which was reduced to 22% (18-34) postoperatively. Postoperative complications were seen in two patients; both of them were osteoporotic and didn't undergo cement augmentation.

Conclusion:

Instrumentation, decompression and correction are effective methods in adequately selected patients with lumbar degenerative scoliosis. For elderly patients with osteoporosis and for patients requiring advanced correction maneuvers, cement augmentation should be considered.

EP-20 DOES SACROILIAC SCREWING ELIMINATES NEED OF ANTERIOR L5-S1 FUSION IN LUMBAR DEGENERATIVE CONDITIONS?

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Background&Aims:

Sacropelvic fixations are usually recommended with supplementation of L5-S1 anterior fusion. Aim of this study was evaluation the results of patients who were operated with stand alone sacropelvic fixation using sacroiliac screws for lumbar degenerative diseases.

Methods:

We evaluated 30 patients (28 women, 2 men) who were operated in 2009 to 2012. Patients' ages, fusion levels, decompressive laminectomy requirement, blood replacement amount and co-morbidities are noted. Oswestry (ODI) scores and VAS were evaluated.

Results:

Average age was 63,3 (39-78 years). Average follow up was 17,5 months (12-37 months). All of the patients were underwent posterior fusion including sacroiliac screws. Average number of fused levels was 9,3 (4-17 levels). 23 of the patients (73,33%) needed at least one level decompressive laminectomy. Complications: Superficial wound infections (3 cases), rod breakage (1 case), junctional kyphosis (1 case), pedicle screw revision for malposition (1 case), sacroiliac screw removal due to malposition (1 case). There were no sacroiliac screw breakage, loosening and lumbosacral pseudoarthrosis findings. Average lumbar VAS was advanced 8,2 to 3,1 and extremity VAS was advanced 6,6 to 2,3. Average ODI was advanced 82,2 to 44,6. Both score differences were statistically significant.

Conclusion:

Sacroiliac screws eliminated need of L5-S1 anterior fusion in this series of patients.

EP-21 ANTERIOR CERVICAL FUSION WITH INTERBODY CAGE CONTAINING B-TRICALCIUM PHOSPHATE

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Background&Aims:

The criteria required for an ideal cage for cervical interbody fusion are the following: providing immediate stability, maintaining spinal alignment and foraminal height, achieving higher or at least equal fusion success rate, and obviating complications by using autograft. Beta tricalcium phosphate (beta TCP) is an osteoconductive, resorbable material, which is used as bone substitute since many years. It has proved its clinical effectiveness in many indications. This study was the first clinical and radiographic report obtained in patients undergoing ACDF in which PEEK cages were filled with beta TCP.

Methods:

Between January 2010 and June 2011, 16 consecutive patients underwent 20 ACDF using PEEK cages with beta TCP at our department. We prospectively followed these 16 patients. The neurological outcomes, preoperatively and at discharge, 3, 6, 12, and 24 months after surgery. We assessed the status of interbody height, and final fusion results.

Results:

All patients were followed up at least 1 year. Postop ODOM's criteria main rate was 3.4. Preoperative average VAS score was 7.9 for neck pain and 8 for arm pain. At the final follow-up, these scores became 1.5 and 1.4 for neck and arm pain, respectively. 19 (95%) disc spaces achieved successful union at 1-year follow-up. The use of a PEEK cage with beta TCP was found to increase the height of the disc immediately after surgery.

Conclusion:

Using PEEK cages were filled with beta TCP are very efficient in achieving cervical fusion, maintaining intervertebral disc height.

EP-22 EVALUATION OF PATIENTS WITH EARLY ONSET SCOLIOSIS: AN MRI ANALYSIS OF 62 CONSECUTIVE PATIENTS

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Background&Aims:

Early Onset Scoliosis (EOS) patients exhibit a high occurrence of associated spinal and organ abnormalities. The evaluation of Congenital scoliosis (CS) is different from the evaluation of more common Idiopathic (IS) or neuromuscular (NS) and syndromic scoliosis (SS) because maternal influences may play a significant role in related deformities and pathologies. Careful MRI analysis allows us to better understand spinal and concomitant anomalies.

Methods:

62 EOS patients (26 CS, 21 NS, 10 SS and 5 IS) were examined with a full spine MRI. The average age was 4.3 years. Intrasplinal, extrasplinal and additional organ anomalies were evaluated by a radiological specialist. Deformities in the coronal and sagittal were measured by plain radiography with Cobb method. Orthopedic pathologies were evaluated clinically and radiologically. Other organ anomalies were examined with abdominal ultrasound and echocardiography. In comparing data a Fischer test was used for statistical analysis.

Results:

MRI analysis revealed 77.4% patients with intraspinal anomalies, 74.1% with extrasplinal anomalies and 14.5% with other organ anomalies. The most common intraspinal anomaly was Syringomyelia (54.8%), extrasplinal anomaly was Hemivertebra (38.7%). The most common intraspinal anomaly was seen in NS (55.1%) and extrasplinal anomaly was seen in CS (62.3%). The average coronal Cobb angles was 46°. The most common orthopedic pathologies were diagnosed with NS (32.1%). 11.2% patients were diagnosed with cardiovascular anomalies, 17.7% with urogenital anomalies. A significant statistical difference was not found between the frequency of intraspinal pathologies in CS and NS ($p=0.059$). A significant difference was found in the rate of Chiari malformation (NS 38.1%, CS 0%, $p=0.001$) and extrasplinal pathologies (NS 61.9%, CS 100%, $p=0.001$). There was a clear difference in hemivertebra and butterfly vertebra ($p=0.000$, $p=0.017$). Other organ anomalies revealed with MRI showed a significant difference (NS 28.6%, CS 3.8%) ($p=0.035$).

Conclusion:

It is difficult to determine the optimum treatment for patients with growing spines. Pathologies vary according to the etiology of scoliosis. In addition to clinical and radiological evaluations, MRI analysis is highly recommended. This study revealed a high occurrence of intraspinal anomalies in both congenital and neuromuscular patients. However, a broader study will offer a more accurate and comprehensive evaluation of these intraspinal pathologies.

EP-23 LUMBOSACRAL TRANSITIONAL VERTEBRA: FREQUENCY IN PLAIN RADIOGRAPHY SERIES

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Background&Aims:

A narrow disc space below a transitional vertebra is more likely a part of the anomaly than a degenerative phenomenon and found to be increased risk of degeneration. For this reason while investigating lumbosacral region presence of transitional vertebra should be noticed. The purpose of this study was to assess the percentage of patients with a transitional vertebra in our general population.

Methods:

In this study 500 consecutive lumbar plain films performed between June 2010 and September 2011 on adult (older than 18 years) patients retrospectively reviewed. The visual assessment was done by two orthopaedic surgeons and one radiologist and documented the presence or absence of a lumbar transitional vertebra according to Castellvi's classification system.

Results:

Of the 500 lumbar plain films studies assessed, 412 (82.4 %) patients had normal lumbosacral segmentation and 88 (17.6 %) had transitional lumbosacral junctions. Among the 88 cases in the LSTV group, we observed lumbarization and sacralization in 34 (6.8 %) and 54 (10.8 %) of the cases, respectively. Among the 34 cases showing S1 lumbarization, we observed the 15 complete (44.1 %), 9 incomplete (26.4 %) and 10 mixed (29.5%) types in cases. Among the 54 cases that had L5 sacralization, we observed the complete, incomplete, and mixed types in 22 (40.7 %), 28 (51.8 %), and 4 (7.5 %) of the cases, respectively.

Conclusion:

Prevalence of transitional vertebra was 17.6 % in this study. Knowing types of transitional vertebra will help both orthopaedic surgeons and radiologist to determine and prevent low back pain early.

EP-24 THE EFFECTS OF MONOAXIAL AND POLYAXIAL SCREW COMBINATIONS ON SPINAL BALANCE IN THE SURGICAL TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS

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Background&Aims:

Polyaxial transpedicular screws are preferred for deformity correction because rod can be inserted into the screw head. However, polyaxial head design may decrease the corrective forces. The aim of this study is evaluation of the corrective effects of screw designs such as polyaxial and monoaxial head on frontal and sagittal balance.

Methods:

56 patients with adolescent idiopathic scoliosis who had lumbar-thoracolumbar curves were included in the study. Two groups were formed: Group1 consisted of 40 patients who were treated with posterior instrumentation with only polyaxial screws at all levels in fusion area. Group2 consisted of 16 patients that were treated with monoaxial screws in distal two segments and the other segments were implanted with polyaxial screws consecutively. Thoracic and lumbar Cobb angles, C7-midsacral line distance, thoracic kyphosis and lumbar lordosis, and pelvic 2parameters were measured on preoperative and postoperative sixth week standing postero-anterior (PA) and lateral radiographs. Statistical analysis was done by using "SPSS v15.0".

Results:

Postoperative lumbar Cobb measurements revealed statistically significant smaller angles in Group1. There was no statistically significant difference between groups postoperatively at kyphosis, lordosis, pelvic tilt and pelvic incidence ($P>0.05$). C7-midsacral line distance was not statistically different between groups postoperatively however in Group2 patients were more centralized than in Group1. Sacral slope angle was significantly decreased in Group2 PO.

Conclusion:

Polyaxial screws can achieve better correction at lumbar curves than monoaxial screws. However, coronal balance and sacral slope may be better controlled with monoaxial screws.

EP-25 SPINOUS PROCESS GRAFTS, IS IT USEFUL AND ENOUGH FOR FUSION SURGERY OF ADOLESCENT IDIOPATHIC SCOLIOSIS

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Background&Aims:

Posterlor Instrumentation and fusion is gold standard for the treatment of AIS (Adolescent Idiopathic scoliosis). All fusion surgery involves preparation of bony surface, remove of soft tissue, decortication, and bone grafting. Autologous bone graft, allograft bone or synthetic materials can be used for grafting. Autologous bone graft from ilium is gold standard technique for fusion. Differently you can use spinous process of the instrumented vertebra as autologous bone graft. In this study we compare, autologous bone graft (spinous process) and allograft bone used two AIS patient groups.

Methods:

34 Lenke type 1 AIS patients divided into two similar groups. Group A 17 Lenke type 1 AIS patients, used allograft and group B 17 Lenke type 1 AIS patients used autograft for fusion. Fusion and correction rate documented with standing AP and LAT orthorontgenograms. Patient outcome scored with SRS-30

Results:

According to x-rays all instrumented levels are fused for both groups. Average follow up period for group A 25,2 months (12-52) for group B 27 months(14-44) average Cobb angle and correction rate 52.2°(44-64) ,%76 for group A and 51°(44-60), %75 for group B. Average SRS-30 scores for group A 3,66 and 3,97 for group B. No statistical difference between two groups for total and sub scores of SRS-30.

Conclusion:

Spinous process can be used as autologous graft for AIS surgery. This technique prevents patient from additional graft area morbidity and decreases the surgery time according to ilium grafting technique and prevents from allograft infection hazards and costs.

EP-26 ASYMMETRIC THORACIC PEDICLE SUBTRACTION OSTEOTOMY IN THE TREATMENT OF SEVERE PEDIATRIC KYPHOTIC DEFORMITIES

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Background&Aims:

The aim of this study is to determine the safety and efficacy of posterior thoracic pedicle subtraction osteotomy (PSO) in the treatment of severe kyphotic/kyphoscoliotic pediatric deformities

Methods:

A retrospective review was performed on 6 consecutive pediatric patients (5 F, 1 M) treated by asymmetric posterior thoracic PSO and instrumentation between 2009 and 2011 in a single institution.

Results:

The average age was 11.8 years (range 7–14 years). Five patients had kyphoscoliosis and one had kyphosis alone. The average follow-up was 15.5 months (12-20). The average preoperative kyphosis and scoliosis angles were 82.1 (range 40–105) , 68.3 (range 8–132) respectively. The average last follow-up kyphosis and scoliosis angles were 38.3 (20-60) and 18.8 (0–40) respectively. There was 54% correction of kyphosis and 72.5% correction of scoliosis. There was one case with a temporary paraplegia which recovered in 6 months. There were no other neurological deficits. There were no early superficial or late deep infections, instrument-related complications or pseudoarthrosis. All patients were found to be well compensated regarding the overall sagittal contour and global coronal alignment at the last follow-up.

Conclusion:

Posterior-based asymmetric thoracic PSO results in significant correction of both kyphotic and scoliotic deformities in the severely deformed spines of children. However, because of the risk of neurological complications, they require technical expertise and should be done with neuromonitorization.

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Background&Aims:

Primary tumors of the spinal cord, spinal meninges and cauda equina are rare lesions and epidemiological studies about these tumors are seldomly reported. Reported incidence rates were 0.22 per 100,000 for malignant, 0.76 per 100,000 for non-malignant primary tumors. Both malignant and non-malignant spinal pathologies cause serious burden such as paralysis, urinary and defecation problems.

Methods:

Clinical, radiological and pathological information of patients operated in our clinic between January 2009 and August 2012 was retrospectively evaluated.

Results:

Total 74 patients were operated in our clinic. Male to female ratio was 1:1. Range of age was 10-71 years (mean: 44,44 years). Prevalence of lesion origin in descending order of frequency was thoracic (33 cases), lumbar (29 cases) and cervical (12 cases) spine. The most common presenting symptom was pain. Twenty two of the cases were containing intramedullary located lesions. The most common pathology in our series was schwannoma distributed equally in males and females which was contrary to the literature. Some neurological deficits developed in 5 patients after operation.

Conclusion:

Epidemiology studies are rare for primary spinal intradural tumors. These studies will give us useful information about nature of pathology and treatment approaches. Distribution of percentages in our study was different from other similar studies conducted in abroad, which will direct the surgical treatment modality differently.

EP-28 BENDING VS. FULCRUM VS. TRACTION X-RAY UNDER GENERAL ANESTHESIA (TRUGA) FOR EVALUATION OF FLEXIBILITY OF CURVES AND PREDICTION OF CORRECTION IN PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS: WHICH IS BETTER ?

, CAGATAY OZTURK, LEVENT ULUSOY, SINAN

MERIC ENERCAN

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Background&Aims:

Bending x-rays (BXR) are traditionally used for evaluation of flexibility in patients with adolescent idiopathic scoliosis. Fulcrum x-ray (F) and traction x-ray under general anesthesia (TRUGA) have been promoted as alternatives to BXR by several studies. The aim of this study is to compare all 3 methods in patients with AIS.

Methods:

80 patients with AIS who were operated by pedicle screw posterior instrumentation and have had BXR, F and TRUGA were included in this study. Curves in A-P and flexibility x-rays were measured and flexibility rates obtained by each method at proximal thoracic (PT), Main thoracic (MT) and Thoracolumbar/lumbar (TL/L) curves was compared using student's t test. A subgroup of patients with more than 60 degrees of MT curve was also evaluated. To evaluate the best method to predict the postsurgical result, the agreement between the methods and postoperative results were examined by using Bland-Altman method.

Results:

The average age of patients (70F, 10M) was 14 (11-17) years and average f/up was 32.7 (24-104) months. There was no significant difference for PT curves between BXR and TRUGA ($p>0.05$). Highest flexibility was demonstrated by TRUGA for MT curves and the difference was significant when compared to BXR ($p<0.001$) but not significant compared to F ($p=0.56$). However, TRUGA demonstrated significantly higher flexibility than BXR and F for curves over 60 degrees ($p<0.05$). In TL/L curves, BXR demonstrated more flexibility rates than TRUGA ($p>0.05$) and F ($p=0.003$). Each of the methods showed significantly less flexibility than postop correction for PT and MT curves ($p<0.001$). Regarding TL/L curve, the difference between F and postop correction was significant ($p<0.01$) while it was not significant for BXR and TRUGA ($p>0.05$). TRUGA demonstrated better 95% limits of agreement with postoperative results for MT and TL/L curves when compared to BXR and F.

Conclusion:

TRUGA offers better flexibility for severe MT curves compared to F and BXR. BXR offers better flexibility rates for PT and TL/L curves however, overestimates postop correction in TL/L curves. TRUGA demonstrates higher agreement with post op correction for MT and TL/L curves.

EP-29 THE ONE STEP FORWARD LATERAL SPINAL X-RAY (OSF): MEASUREMENT OF SAGITTAL AND SPINOPELVIC PARAMETERS IN A FUNCTIONAL POSITION

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Background&Aims:

Previous studies demonstrated an association between HRQL and sagittal balance for the Adult SD population, rendering an accurate evaluation of sagittal balance very important. Patients develop compensatory extension of hips, retroversion of pelvis and flexion of knees, identification and elimination of which may be useful. OSF is a lateral X-ray taken with the patient in the "starting to walk" position, taking the first step forward. To compare the sagittal balance and spinopelvic parameters between regular lateral and OSF x-rays in an ASD population and in those with increased pelvic retroversion (Pelvic Tilt>25).

Methods:

47 patients with ASD enrolled had their standing lateral x-rays in regular and OSF positions. OSF was defined as that with the patient taking one full step forward with the self-preferred side. Sagittal spinal and spinopelvic parameters were measured. Comparisons were made for the entire population and for patients with PT>25 degrees.

Results:

Of 47 patients, 17 had PT>25 degrees. As can be seen on Table, OSF did not create any effect in the general population but did so in PT>25 patients for SPA, SSA and GT and for SS, PT and PI.

Conclusion:

As evidenced by a decrease in the PT values, OSF eliminates the compensatory pelvic retroversion. It would be reasonable to accept the measurements in OSF as the more "functional" measurements. It is also probable that using OSF in surgical planning may decrease the possibility of imbalance.

EP-30 SURGICAL MANAGEMENT OF POST-DISCECTOMY PAIN SYNDROME (PPS) WITH TRANSFORAMINAL LUMBAR INTERBODY FUSION (TLIF)

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Background&Aims:

PPS is seriously challenging problem. TLIF has been used to treat degenerative spinal disorders for many years. We set up an algorithm for this situation and treated our patients according to the algorithm by using TLIF.

Methods:

47 patients with PPS that have no response to 6 weeks conservative treatment referred to our institution between 2010 and 2012, were included in the study. The MRI, 3DCT scan and lumbar dynamic X-rays for all patients were obtained. All patients were evaluated according to the treatment algorithm (Figure1), as a result 32 patients who were indicated to undergo TLIF surgery were included in the study. Furthermore, all patients were evaluated by using visual analog scale (VAS), Oswestry Disability Index (ODI). All patients were asked to fill a satisfactory questionnaire which is prepared for our study results. Mean age was 44,3 years (28-55), the female/male ratio was 13/19. Four patients had only back pain and the others had combination of leg and back pain. Four patients had spondylodiscitis, 1 had recurrent disc herniation, 1 had facet joint arthritis, 8 had epidural fibrosis, and 2 patients had segmental spinal instability. The mean interval between index surgery and TLIF surgery was 9 months (3, 5-34). The patients were followed at postop 6th week, 3th month, 6th month, first and second year after operation radiologically and clinically with VAS and ODI.

Results:

The mean follow-up was 14,2 month (3-22). Preoperative mean VAS was 8.1 (7-9), while mean postoperative VAS was 2.4 (1-4), and at the final follow-up VAS score was 1.8 (range 0-4). The mean ODI was 48 % (32-64%) preoperatively and 26.4% (5-40%) postoperatively and 24.2% (0-36%) at the final follow-up. Postoperative infection, neurological deficit, pseudoarthrosis and implant related complication were not detected. All patients stated their satisfaction at the final follow-up.

Conclusion:

The treatment and management of the PPS is still challenging, however TLIF was found to be an effective treatment option when indicated after evaluation with detailed patient evaluation algorithms including minimal invasive diagnostic and therapeutic modalities such as facet denervation, epidural injection..etc.

EP-31 BENDING X-RAYS VS. TRACTION X-RAY UNDER GENERAL ANESTHESIA (TRUGA) FOR EVALUATION OF FLEXIBILITY OF CURVES AND PREDICTION OF CORRECTION IN PATIENTS WITH ADULT IDIOPATHIC SCOLIOSIS: WHICH IS BETTER ?

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Background&Aims:

Bending x-rays (BXR) are traditionally used for evaluation of flexibility in patients with adolescent idiopathic scoliosis. There are few studies reporting traction x-ray under general anesthesia (TRUGA) may be a better alternative to BXR in AIS patients. There are no studies so far comparing both techniques in adult idiopathic scoliosis (Adults), which may reflect different intrinsic curve characteristics. The aim of this study was to compare BXR with TRUGA in patients with Adults.

Methods:

40 patients with Adults who were operated by pedicle screw posterior instrumentation and have had both preoperative BXR and TRUGA were included in this study. Traction x-ray was taken under general anesthesia after induction and before positioning the patient. The flexibility rate obtained by each method at proximal thoracic (PT), Main thoracic (MT) and Thoracolumbar/lumbar (TL/L) curves was compared using student's t test. A subgroup of patients with more than 60 degrees of MT curve was also evaluated. To evaluate the best method to predict the postsurgical result, the agreement between the methods and postoperative results were examined using Bland-Altman method.

Results:

The average age of patients (32F, 8M) was 25 (20-50) years and average f/up was 38.6 (24-96) months. The difference between flexibility rates by each method was similar for PT curves ($p>0.05$). TRUGA demonstrated significantly more flexibility rates for MT curve ($p=0.000$) and more flexibility for TL/L curves which did not reach to significance ($p=0.053$). TRUGA also demonstrated significantly more flexibility rates for MT curves over 60° ($p=0.000$). TRUGA demonstrated better 95% limits of agreement with postoperative results for all PT, MT and TL/L curves when compared to BXR (table 1).

Conclusion:

TRUGA demonstrates more flexibility rates for both mild and severe MT curves and provides a better agreement with the postoperative correction rates in patients with Adults.

EP-32 SACROPELVIC FIXATION IN ADULT SPINAL DEFORMITY (ASD); A VERY HIGH RATE OF MECHANICAL FAILURE

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Background&Aims:

Sacropevic fixation (SPF) is an integral part of ASD surgery. Literature suggests that combination of S1 and Iliac screws may be associated with lowest rate of complications. To analyze the mechanical failure rate of SPF and residual sagittal imbalance as a potential cause.

Methods:

Of 483 patients enrolled in a prospective multicentric database, 47 (9.7%) were identified as having had SPF. 36 of those with > 6 months (or to failure) f/up constitute the population. Type of Iliac fixation was S2 alar/Iliac (S2AI) screws in 21 (58.3%) and Iliac screws with lateral connectors (IwL) in 15 (41.7%). Diagnoses were degenerative in 18, failed back in 7 and other in 11. Average instrumentation length was 11.6+/-4.0 levels.

Results:

A total of 13 Implant related complications were identified (36%); 8 were mechanical failures of SPF (22.2%), 4 were rod breakages and 1 was prominence. Failures were identified on an average of 214 days (64 to 408). Failure rate of S2AI screws was 29% vs 13% for IWL screws ($p>0.05$). Of note, all broken screws were associated with S2AI technique with polyaxial screws. Comparison of failed cases to others revealed that failed cases had inadequate restoration of LL. (Table)

Conclusion:

Pelvic fixation is still associated with a very high rate of mechanical failure. A major risk factor appears to be inadequate restoration of lordosis and SVA. In cases with suboptimal sagittal plane correction, S2AI with polyaxial screws seem to have higher risk of short term acute failure compared to IWL.

EP-33 BIOMECHANICAL COMPARISON OF COFLEX AND COFLEX RIVET INTERSPINOUS DEVICES ON RANGE OF MOTION AND LOADING CHARACTERISTICS OF LUMBAR SPINE : A FINITE ELEMENT STUDY

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Background&Aims:

The aim of this study is to analyse the effect of Interspinous devices, Coflex® Interspinous Device and Coflex Rivet™ Device which are widely used clinically, to the range of motion and disc load characteristics of low lumbar spine in the surgical and adjacent segment biomechanically with finite element method (FEM)

Methods:

First 3 lumbar vertebrae are modelled by FEM. Then one Coflex® Interspinous Device (Paradigm Spine, LLC, New York, NY) and one Coflex Rivet™ (Paradigm Spine, Wurmlingen, Germany) are modelled and implanted virtually at L4-L5 segment of lumbar vertebrae by FEM. Flexion, extension, bending and rotation forces are applied to these two models and one intact vertebrae model. Range of motion and disc loading forces at L3-4 and L4-L5 level are measured and compared.

Results:

In this study there are four main findings. (1) The CoflexRivet™ device provides stability in all over the range of motion especially in flexion, (2) Coflex Rivet™ decrease the disc loading and ROM in all movements in the surgical segment (3) In all movement directions the Coflex Rivet™ cause lower ROM and annulus stress in the upper adjacent segment (4) both devices decrease the ROM and stress in extension, bending and rotation in both the surgical and upper adjacent segments.

Conclusion:

We observed that, in flexion, Coflex Rivet™ device decrease the disc load and range of motion at both surgical and upper adjacent segment at the lower lumbar vertebrae. In extension, bending and rotation, both devices have nearly equal effect on the range of motion and disc loading in both surgical and upper adjacent segments.

EP-34 DOES INTERBODY FUSION AT THE ADJACENT DISC LEVELS REDUCE THE PSEUDOARTHROSIS RATE OF THORACOLUMBAR AND LUMBAR PSO?

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Background&Aims:

Rate of pseudoarthrosis has been reported up to 25% after pedicle subtraction osteotomy (PSO). Instability created by wide laminectomy at PSO site with mobile adjacent discs has been blamed as a cause of pseudoarthrosis. Interbody fusion (IF) at adjacent discs have been suggested to prevent pseudoarthrosis. Aim of this study was to assess the radiographic outcomes and pseudoarthrosis and rate and complications of patients who underwent PSO combined with interbody fusions at the upper and lower adjacent levels.

Methods:

16 (8F/8M) patients treated with thoracolumbar and lumbar PSO combined with interbody fusion technique by single surgeon and >2 year f/up were included in this study. Sagittal plane parameters including thoracic kyphosis (TK), lumbar lordosis (LL), local kyphosis angle (LKA), sagittal C7 plumbline (C7-CSVL) were measured in 36 inch standing preop, postop and f-up x-rays. Hospital charts were evaluated in terms of complications.

Results:

The average f/up period was 44 (24-123)months. Average age was 53.2(34-74).PSO levels were;T12 (n=1), L1(n=1), L2(n=5), L3(n=7), L4 (n=2). IF was performed through anterior approach as a staged procedure in all pts. TK increased from 42.370 (21-74) to 36.680(17-57), LKA improved from 330(18-60) to -2.310 (10--12), LL improved from +50 (-18--50) to -35.870(-20--57) and C7-CSVL from 117mm (63-200) to 37(3-62)mm. from preop to postop.. At f-up TK, LKA and LL were 39.260(20-61), -1.380 (10--13) and -30.780 (-16--52)respectively. There was no significant differences in all parameters between post-op and f/up x-rays (p>0.05). Complications included dural tear in 6 pts, massive intraoperative hemorrhage in 1 pt, superficial infection in 3 pts. There were no pseudoarthroses or implant failure at the final f/up.

Conclusion:

Interbody fusion at adjacent disc levels prevents pseudoarthrosis in the treatment of sagittal imbalance with thoracolumbar and lumbar PSO.

EP-35 THE EFFECT OF SURGICAL TREATMENT VIA POSTERIOR CLOSING WEDGE OSTEOTOMY ON SAGITTAL BALANCE AND SPINOPELVIC PARAMETERS IN CONGENITAL KYPHOSIS

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Background&Aims:

The aim of this study was to evaluate the radiographical results of closing wedge osteotomy with posterior instrumented fusion with an emphasis on sagittal spinal and spinopelvic parameters in patients with congenital kyphotic deformity.

Methods:

We retrospectively evaluated the radiographical results of 12 patients (5 male, 7 female) who were subject to closing wedge vertebral osteotomy and posterior instrumented fusion due to congenital kyphosis. Nine patients were diagnosed with deformity type 1, one patient with type 2 and 2 patients with type 3. The mean age of the patients at surgery was 13.3 years (range 8-22 years). Radiographical measurements including local kyphosis angle, correction loss and sagittal balance values were noted for the preoperative, postoperative and final follow up periods respectively. The sagittal spinal and spinopelvic parameters consisted of cervical lordosis (C2-C7), thoracic kyphosis (T1-T12, T2-T5, T5-T12, T10-L2), lumbar lordosis (L1-S1), sagittal balance, pelvic tilt, pelvic incidence vs sacral slope. The data obtained from those periods underwent statistical analysis.

Results:

Average follow up was 47.3 months (range 18-96 months). The mean local kyphosis angle was 75.3° (range 42°-112°) prior to the surgery, 30.8° (range 14°-62°) following the surgery and 32.7° (range 16°-65°) during the follow up period respectively (p<0.05). A correction rate of 59.1% was reported at the final follow up. The loss of correction at the final evaluation was 2.5%. Average sagittal balance was measured as 36.6 mm (range -77- 77 mm) prior to the surgery, 20.8 mm (range -52- 46 mm) following the surgery (p<0.05) and 20.2 mm (range -42- 15 mm) during follow up period (p>0.05). No significant change was observed in spinopelvic parameters for preoperative-postoperative and follow up periods. Complications consisted of a rod fracture due to pseudoarthrosis, an implant failure with loosening of screws, a proximal junctional kyphosis and a neurological deficit respectively.

Conclusion:

Closing wedge osteotomy with posterior instrumented fusion is an efficient method of surgical treatment in terms of sagittal balance restoration and deformity correction in patients with congenital kyphosis, but spinopelvic parameters seem to be not affected by the so-called intervention.

EP-36 THE IMPORTANCE OF EARLY DIAGNOSIS AND TREATMENT IN CONGENITAL SCOLIOSIS

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Background&Aims:

This study evaluates how early diagnosis of congenital scoliosis affects results and complication rates of surgical treatment.

Methods:

We have evaluated the efficiency and effectiveness of modern posterior spinal instrumentation methods in congenital scoliosis cases who were diagnosed and treated in our department. We have evaluated 53 patients (13 male, 29 female) who were operated for congenital scoliosis between 1995 and 2009. Patients were divided into two groups according to the time of diagnosis to evaluate fusion levels, numbers of surgery, surgery methods, reduction rate, intraspinal and other system abnormalities and complications.

Results:

9 of 24 patients with diagnosis age before 5 and 11 of 29 patients with diagnosis age after 5 treated with single operation. Correction of main curve was %35.4 and compensatory curve was %13. Main curve correction of patients under 5 age was %36.3 and main curve correction of older group was %34.8 ($p>0.05$). Average number of fused levels in first group was 2.3 ± 2.1 and in the older group 7.5 ± 3.1 .

Conclusion:

In patients before 5 age less invasive surgeries were needed to accomplish successful treatment and early diagnosis of congenital scoliosis is the most important part of the treatment.

EP-37 TREATMENT OF LENKE TYPE 5C ADOLESCENT IDIOPATHIC SCOLIOSIS WITH SELECTIVE POSTERIOR FUSION (COBB TO COBB)

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Background&Aims:

Aim of this retrospective study was to evaluate the results of selective posterior fusion (Cobb to Cobb) in Lenke 5C (TL/L) curves.

Methods:

Selectively fused 22 consecutive pts (21F and 1M) with Lenke type 5C AIS with mIn 2 yrs f/up were included. Radiographic analysis included measurement of coronal and sagittal parameters on preop and postop standing AP and lateral x-rays, and measurement of "sacral oblique take-off angle" (SOTA) on Ferguson x-rays. Segmental pedicle screw instrumentation with 5.5mm titanium rods between UEV and LEV (Cobb to Cobb) was performed and allografts were used for posterior fusion after facet decortication only. Clinical outcome was evaluated with SRS-22r.

Results:

Av age was 15.1 (13-17) and av f/up was 38 (24-84) months. Preop av TL/L Cobb angle of $41.6\pm 9.6^\circ$ was corrected to $4.6\pm 5.1^\circ$ (89% correction rate). Spontaneous correction of compensatory curve was 58% (18.8° to 7.7°). 12 pts with preop local kyphosis (T10-L2) of av 12.09° (5° - 22°) was corrected to 3.58° (-3° - 11°) postoperatively. In 16 (72,72%) patients there was $6.3\pm 3.1^\circ$ sacral oblique take-off. Av instrumentation level was 5.2 ± 0.6 with L3 to be the lowest instrumented vertebra (LIV) in all patients. LIV tilt improved from $24.5\pm 5.9^\circ$ to $2.5\pm 1.6^\circ$ (90,61%). There was a significant correlation between SOTA and postop disc wedging under LIV ($P=0.019$). Av f/up SRS-22r total score was 4.31 (3,78-4,72). One patient had revision surgery for pseudoarthrosis (4.54%) with one screw loosening at LIV without extending fusion distally.

Conclusion:

This study has demonstrated that selective posterior fusion (Cobb to Cobb) can provide significant correction of TL/L curve and spontaneous correction of thoracic compensatory curve in Lenke 5C AIS. Postop residual disc wedging below LIV is associated with preop sacral oblique take-off angle (SOTA).

EP-38 XLIF COMPARING TLIF FOR INTERBODY FUSION AT UPPER AND MID-LUMBAR LEVELS IN PATIENTS WITH DEGENERATIVE SPINAL DISORDERS

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Background&Aims:

To analyse and compare retrospectively fusion rates and complications of lateral lumbar Interbody fusion procedures (XLIF) vs transforaminal Interbody fusion (TLIF) at upper lumbar levels (L1-L2) and mid (L2-L3,L3-L4) lumbar levels. To our knowledge there is not yet any study comparing the 2 techniques.

Methods:

65 patients; mean age 64 (50-78) surgically treated by posterior decompression and fusion + Interbody fusion and with min 2 year f/up, were included. Radiographs were evaluated to determine the fusion rates and mechanical complications. Hospital charts were evaluated for demographics, major (deep infection,pseudoarthrosis,vascular injury,pneumonia,nerve root injury) and minor (arrhythmia,dural tear, DVT, hematoma,wound detachment, gastrointestinal,urinary infection) complications.Clinical outcome was assessed by using preoperative and f/up ODI.

Results:

The etiology was spinal stenosis with deformity in all patients. Interbody fusion was done at 127 levels.TLIF was performed for L1-L2 level 18 pts (14.1%), L2-L3 level 30 pts (%23,6), L3-L4 level 22 pts (%17,3) and XLIF was performed for L1-L2 level 18 pts (14.1%), L2-L3 level 23 pts (%18,1), L3-L4 level 16 pts (%12,5). All levels were fused in both TLIF and XLIF groups and the ODI scores were improved from 53,3 to 29,7 for TLIF and from 51,8 to 31,1 for XLIF with no significant differences ($p>0.05$). 6 major (%4.7) and 28 (%22) minor complications were detected. All of major complications were at TLIF group. 17 minor complications were found at TLIF group and 9 at XLIF group. TLIF group had more major complications compared to XLIF group but it wasn't found statistically significant ($p=0.064$). The 2 groups were similar according to minor complication rates ($p=0.479$). TLIF group was found statistically significant for total blood loss ($P=0.038$) and for ICU stay ($P=0.002$).

Conclusion:

Major complications are seen more common after TLIF procedure compared to XLIF for the treatment of adult degenerative disorders. The minor complication rates, the fusion rates and the clinical outcomes are similar for XLIF and TLIF.

EP-39 THE EFFECT OF BONE MINERAL DENSITY ON FUNCTIONAL OUTCOMES AND FUSION STATUS IN PATIENTS UNDERWENT INSTRUMENTED ANTERIOR CERVICAL DISCECTOMY AND FUSION

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Background&Aims:

The objective of this study was to investigate the influence of bone mineral density (BMD) on functional outcomes and on fusion status in patients who underwent instrumented anterior cervical discectomy and fusion (ACDF).

Methods:

32 patients (20 females, 12 males; mean age 52±8) who underwent instrumented single or two-level instrumented ACDF were enrolled. The mean follow-up period was 25±6 months. BMD was measured by the dual energy x-ray absorptiometry (DEXA) method. Computerized tomography with 1 mm thick were obtained to assess fusion status. Functional outcomes were analyzed by using Neck Disability Index (NDI), Short-Form 36 (SF-36) and Visual Analogue Scale (VAS). The relationship between BMD, functional outcome and fusion status was analyzed statistically.

Results:

The mean BMD of all patients was 0.926±0.257 g/cm². Fusion was observed in 25 (78.1%) of the patients whereas 7 patients (21.9%) were found to have nonunion. The mean BMD of the patients with fusion and with nonunion was 0.973±0.168 g/cm² and 0.665±0.134 g/cm², respectively. The mean BMD of patients with "fusion" was significantly greater than those with "nonunion" ($P=0.038$). The mean preoperative NDI, SF-36, and VAS score of the patients was 44.1±2.8, 46.3±10.8, and 8.4±2.5, respectively. The mean postoperative NDI, SF-36, and VAS score of the patients was 12.7±4.1, 74.5±12.5, and 1.2±0.6, respectively in the fusion group and 17.9±2.1, 63.6±3.7, and 2.3±1.1, respectively in the nonunion group. All patients significantly improved functionally ($p<0.05$), however, the mean functional improvement was significantly higher in the fusion group ($p=0.027$). No significant relation was found between the BMD and functional improvement in both groups ($p=0.182$ and $p=0.217$).

Conclusion:

BMD affects fusion status in patients undergoing instrumented anterior cervical discectomy and fusion. In the presence of low BMD values, surgeons should make preoperative planning meticulously when performing instrumented ACDF.

EP-40 ADJACENT DISC DEGENERATION AFTER LUMBAR SPINE SURGERY FOR DEGENERATIVE LUMBAR SPINE

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Background&Aims:

To determine adjacent disc degeneration and related factors that influenced after lumbar spine surgery.

Methods:

From 1995 to 2010, 56 patients were operated with fusion for degenerative lumbar spine studied. Patients were 16 male and 40 female with mean 55 (21-77) years old. Posterior lumbar interbody fusion (PLIF) (28 patients) and transforaminal lumbar interbody fusion (TLIF) (28 patients) were performed with posterior stabilization used pedicle screw construct. Fusion were determined computerized tomography (CT) and standard X-ray. Postoperative progression of disc above fusion segment degeneration was defined as a radiologic condition in which narrowing of disc height was greater than 3 mm, posterior opening was greater than 5°, and progress of slippage was greater than 3mm in comparison with preoperative lateral radiographs. Patients satisfaction was determined with Visual analogue scale (VAS) for pain and Oswestry Disability Index (ODI) for functional disability. Student t test and chi square test were used for statistical analysis.

Results:

Adjacent segment degeneration (ADS) was determined at 19 patients (7 male and 12 female) with mean age 58 (34-77) years old. VAS was improved from 7,4 (6-9) to 3 (1-6), ODI was improved from 74% (63%-90%) to 33% (9%-66%). Disc space that fused height increased from 5,8 mm (3-10) to 11mm (8-13). No statistically significant correlations were revealed by the comparison of radiological angular characteristics before surgery, after it and at the onset of ADS.

Conclusion:

Radiologic degeneration of the cranial adjacent segment after lumbar spine surgery did not significantly correlate with clinical outcomes, surgical techniques and preoperative radiologic factors

EP-41 THE PRIMARY GOAL OF THE PROSPECTIVE STUDY WAS TO EVALUATE THE EFFICIENCY AND SAFETY OF INTRAOPERATIVE HALOFEMORAL TRACTION WHO HAS CURVE GREATER THAN 70 DEGREES.

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¹ ~~MBBARKONRVERSITESINIR EAH~~

Background&Aims:

The primary goal of the prospective study was to evaluate the efficiency and safety of intraoperative halofemoral traction who has curve greater than 70 degrees.

Methods:

A total of 13 consecutive patients with severe scoliosis treated with intraoperative halofemoral traction were identified from database. The mean age of the patients was 17,6 (15-25). There were 2 males and 11 females. The average follow up period was 15,3(3-28 months). The average preoperative Cobb angle was 80,1 (72-85). The highest screw was placed at the level of T2 vertebra. The lowest screw was placed to the L3 vertebra in 11 patients and L4 in one patient.

Results:

The postoperative mean Cobb angle was 10,9 (0-25). Coronal and sagittal balances were achieved; shoulder levels were equalized in all patients. During intraoperative correction a decrease in medulla spinalis potentials was detected therefore traction was ceased. Postoperative infection, neurological deficit, psOdoarthrosis and implant related complications were not detected. All of the patients experienced pain relief and improved mobility after surgery and during the follow-up period.

Conclusion:

Intraoperative halofemoral traction attempts to achieve safe and effective method for the treatment of severe scoliotic curves over 70 degrees. It can also decrease the risk of neurologic compromise associated with combined spine procedures.

EP-42 PERCUTANEOUS STENT KYPHOPLASTY AND PERCUTANEOUS PEDICLE SCREW FIXATION FOR THE MANAGEMENT OF OSTEOPOROTIC BURST FRACTURES OF THORACO-LUMBAR SPINE

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Background&Aims:

The study design includes prospective evaluation of percutaneous osteosyntheses associated with stent kyphoplasty on 48 patients. The objective of the study is to assess the efficacy of a percutaneous method of treating osteoporotic burst fractures in patients without neurological deficits.

Methods:

48 patients were included in this study. The patients' mean age was 68 years (range 56-78 years) and the neurological examination was normal. A percutaneous approach was systematically used and a stent kyphoplasty was performed via the transpedicular pathway associated with percutaneous short-segment pedicle screw osteosyntheses. The patients' follow-up included CT scan analysis, measurement of vertebral height recovery and local kyphosis, and clinical pain assessments.

Results:

With this surgical approach, the mean vertebral height was improved by 28% and a mean improvement of 13.4 degrees in the local kyphotic angle was obtained. 3 months after the operation, none of the patients were taking analgesics. The mean duration of their hospital stay was 3.5 days (range 3-7 days) and the mean follow-up period was 42 months (range 24-60 months). No significant changes in the results obtained were observed at the end of the follow-up period.

Conclusion:

Minimally invasive methods of treating unstable vertebral fractures without any neurological deficits can be performed via the percutaneous pathway. This approach gives similar vertebral height recovery and kyphosis correction rates to those obtained with open surgery. It provides a short hospital stay, however, and might therefore constitute a useful alternative to open surgical methods. The use of vertebral stent provides structural support, prevents vertebral collapse and cement-related complications as it needs less cement injection compared with balloon kyphoplasty.

EP-43 INTRAOPERATIVE ASSESSMENT OF THE TRUNK AND SHOULDER BALANCE AT SCOLIOSIS SURGERY WITH A TEMPLATE

, CAN SOLAKOGLU, OMER POLAT, FERIT MANGAL, ENDER UGUTMEN

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Background&Aims:

By using an Ermi's template we can lessen the usage of fluoroscopy during surgery, minimize the patient's coronal imbalance and make a decision about the balance of the shoulder.

Methods:

The main purpose of scoliosis surgery is to achieve a balanced solid spine fusion. This correction technique may cause deterioration in the balance of the trunk and shoulder. To avoid these, there are some parameters often used to assess the balance; coronal height, angulation and T1 tilt. In addition, sacrum and 7th cervical vertebra must be in the same straight line. Ermi's template is a transparent radiolucent polyethylene template that contains 1.5 and 3 mm thick parallel steel wires. Before positioning the patient we put this template on the operation table. Then the patient is positioned prone on this template.

Results:

Before starting the operation we get an anteroposterior sacrum radiograph to make sure that the patient is in the middle of the template. End of the correction maneuver we get a fluoroscopic anteroposterior radiograph of the sacrum and iliac wings again and 1st thoracic vertebrae. Vertical line of the template must be across the 7th vertebral body and middle of the sacrum. This finding means that patient has a good trunk balance. And also if the C7-T1 disc is parallel to the horizontal lines that means we gained shoulder balance.

Conclusion:

Just within 3 radiographs; anteroposterior sacrum before surgery, anteroposterior sacrum after surgery and anteroposterior 1st thoracic vertebrae, we can learn the patient's standing position the day after surgery.

EP-44 RIGHT HANDEDNESS AS A PROBLEM? DOES SURGEON'S HAND DOMINANCE PLAY A ROLE IN THE ORIENTATION OF TRANSPEDICULAR SCREW INSERTION?

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Background&Aims:

In spine practice usually right handed surgeons are much comfortable on the right side of the patient during the pedicular screw insertion. Hand dominance of the surgeon plays a role during the insertion of pedicle screw.

Methods:

A total of 269 pedicle screws inserted by two right-handed surgeons standing on different sides of patients using free-hand technique were investigated. A parallel line was drawn to the endplate of the vertebrae on lateral radiograph. Angle between the screw and line parallel to endplate was measured. Angles were categorized as cranial '+' when the tip of the screw stands above the endplate line and as caudal '-' when the tip of the screw stands below the endplate line. Angles were measured for all patients using a specific digital x-ray analysis software.

Results:

A total of 137 pedicle screws were inserted from the left side and 132 screws from the right. From the left side, 80 screws (58.3%) were inserted cranially (+), 44 screws caudally (-) (32.1%), and 13 screws were inserted parallel to the end plates. From the right side though, 39 screws were inserted cranially while 82 (62.2% caudally and 11 screws parallel. This difference in orientation was statistically significant. (Chi square, p= 0,0000).

Conclusion:

It appears that the handedness of surgeons do affect the orientation of pedicle screws. This may create problems in the insertion of the upper level screws from the left side and lower level screws from the right side for right handed surgeons. Based on this finding, ambigüty in handedness may need to be a necessary part of pedicle screw insertion training for spinal surgeons.

EP-45 EFFECTIVITY OF INTERBODY FUSION PROCEDURE IN DEGENERATIVE SPINE DISEASES

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Background&Aims:

The effectivity of interbody fusion as a surgical treatment option on the degenerative spine disease and assessment of results.

Methods:

We made a retrospective study on 56 patients who were diagnosed with degenerative spine disease and treated using interbody fusion in our institute between 1995 - 2010. The mean age of the patients was 54,46 years (min. 21 - max.77). 25 of patients had spinal stenosis, 14 of patients had degenerative spondylolisthesis, 2 of patients had de novo scoliosis and 15 of patients had degenerative disc disease. Anterior-posterior projection and lateral lumbosacral and CT projections were used for radiologic evaluation of patients. Preoperative and postoperative intervertebral disc height, lumbar and segmental lordosis angle and fusion were measured for radiological assessment. Preoperative and postoperative VAS and ODI scores were measured for functional assessment.

Results:

Our mean follow-up was 66 month (min 8-max 230). Decreases in VAS (preop. mean 7,37-postop.mean 2,93) and ODI scores (preop.mean 74,48-postop.mean 31,23) before and after operation were significant. (p < 0,05). Increases in intervertebral disc height (preop.mean 5,46-postop mean 11,18) and lumbar lordosis angle (preop.mean 20,34-postop.mean 32,41) before and after operation were significant. (p < 0,05). In all patients we have seen circumferential fusion. In all patients one of them had dural ligament tear, one of them had superficial infection and one of them had facet joint degeneration. Adjacent segment degeneration reported in 19 patients (%37,3). But ODI scores and lumbar lordosis angles between patients who had ASD and no ASD were not significant.

Conclusion:

Discectomy for pain relief, increasing intervertebral disc height, restoration of sagittal imbalance and high fusion rate are advantages of interbody fusion for the treatment of degenerative spine diseases. We found effectiveness interbody fusion procedure in our study for the treatment of degenerative spine disease.

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Background&Aims:

A retrospective review of clinical and radiographic data from a single-center, prospectively collected scoliosis database. We aimed to assess frontal and sagittal parameters after posterior spinal fusion and instrumentation for adolescent idiopathic scoliosis (AIS).

Methods:

Twenty-two patients with AIS (mean age, 14.2±2.4 years) treated by segmentally pedicle screw instrumentation were analyzed after a minimum follow-up of 2 years. Radiographic parameters and clinical assessments by using the Scoliosis Research Society-30 (SRS-30) Questionnaire were recorded preoperatively, third and sixth months postoperatively, and every year after.

Results:

The average thoracic or thoracolumbar curve correction rate was 74.6±11.8 and total SRS scores improved from 3.4±0.6 to 4±0.3. The average postoperative lumbar lordosis decreased from a mean 51.3±13.1° to a mean 42.8±12.6° at the final follow-up (p=0.014). Sacral obliquity angle was negatively correlated with thoracolumbar lordosis (r=-0.524, p=0.012).

Conclusion:

At the final follow-up, fusion of the thoracic or thoracolumbar spine leads to lumbar hypolordosis. Increased the sacral obliquity improved thoracolumbar lordosis but any effects to lumbar lordosis.

EP-47 TO DETERMINE ADOLESCENT IDIOPATHIC SCOLIOSIS VERTEBRAL ROTATION, SUPINATION AND PRONATION CT IMAGING OF THE COMPARISON.

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Background&Aims:

AIS da posterior girisimden önce gercek zamanlı gOrUntU elde etmek amacıyla , pronasyonda yapılan BT OICUmlerinin standart suplnasyon gOrUntUleriyle kıyaslamak.

Methods:

AIS nedeniyle posterior cerrahi planlanan 12 hasta çalışmaya katıldı. 9 'u bayan olup, yaşları ortalama 14.4 idi. Lenke sınıflamasına göre 6 hasta T1p1A, 2 hasta T1p3C, 2 hasta T1p5C, 1 er hastada T1p 3A ve T1p3B olarak saptandı. 7 hastada 1 apeks OICUmU yapılırken, 3 hastada 2 , 2 hastada da 3 apikal rotasyone vertebradan OICUm yapıldı. Çalışmamızda Aaro Dahlborn yöntemi kullanılarak aCılar apikal rotasyone vertebralarda saptandı ve karşılaştırıldı.

Results:

Tüm olgularda pronasyon ve suplnasyon BT lerl arasında rotasyon aCılarında farklar bulundu ancak bunlar istatistiksel olarak anlamlı değildir. (p>0,05). Lomber seviyelerinde pronasyon ve suplnasyon aCıları arasında istatistiksel olarak anlamlı farklılık bulunmamakta olup (p>0,05); Suplnasyon aCısı Pronasyon aCısından dikkat çekici şekilde yüksek saptanmıştır. Torakal seviyelerinde pronasyon ve suplnasyon aCıları arasında istatistiksel olarak anlamlı farklılık bulunmamaktadır (p>0,05).

Conclusion:

Lenke değerlendirilmesine göre aynı tip eğrilik dahil olsa hastalardaki apikal rotasyon derecesi ve rib-hump varlığı suplnasyon ve pronasyonda yapılan OICUmler üzerinde minimalde olsa farklılıklara yol açmaktadır. AIS da posterior girisim öncesinde grafi nasıl posterlordan OICUIUp değerlendiriliyorsa BT nin de pronasyonda çekilmesinin gerçek zamanlı gOrUntU vermesinden dolayı uygun olacağını düşünmekteyiz.

EP-48 IS LUMBAR DECOMPRESSION AND FUSION SAFE FOR ELDERLY PATIENTS: OUTCOMES OF PATIENTS OVER AGED 75

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Background&Aims:

The treatment of degenerative lumbar spinal stenosis in elderly patients is usually avoided for fear of co-morbidities, mortality and high complication rates. In this study we have evaluated results of 26 patients aged over 75 treated for spinal stenosis.

Methods:

Between May 2009 and November 2012 twenty six patients over 75 years of age who have operated with spinal stenosis reviewed. All patients have posterior fusion and implantation. All patients evaluated by age, sex, fusion levels, ASA scores, complications, transfused blood units, preoperative and postoperative. Between May 2009 and November 2012 twenty six patients over 75 years of age who have operated with spinal stenosis reviewed. All patients have posterior fusion decompression and implantation. The patients evaluated with age, sex, fusion levels, ASA scores, complications, transfused blood units, preoperative and postoperative Oswestry scores and visual analogue pain scores (VAS). Oswestry scores and visual analogue pain scores (VAS).

Results:

There were 4 men and 22 women. Mean age were 78,2 (75-84). Mean number of instrumented levels were 5,6 (2-10) and mean operation time was 112 (92-184) minutes. Mean follow up was 15 months (6-44). There were no mortality and serious complications except one infection. Mean VAS scores for lumbar area and for leg statically significantly decreased (8 to 2 and 7 to 4 respectively) Oswestry scores decreased postoperatively (85,6 to 28,8). Differences were statically significant.

Conclusion:

Surgery for lumbar spinal stenosis with decompression and instrumentation was found to be safe in elderly patients and should be considered as a treatment option for the patients over aged 75.

EP-49 DEFORMITY CORRECTION WITH TRANSLATION TECHNIQUE IN THE TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS:MINIMUM TWO YEARS FOLLOW UP

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Background&Aims:

The aim of the study is to evaluate the results of translation technique in the treatment of adolescent idiopathic scoliosis

Methods:

Between 1999-2009, 181 patients (33 male, 148 female) with adolescent idiopathic scoliosis treated by posterior spinal instrumentation and fusion with translation technique. All the operative procedures were performed by the same surgeon.

Results:

Mean age was 16.1 (range 10-43). According to the Lenke classification, 75 patients were type 1, 4 patients type 2, 38 patients were type 3, 21 patients were type 4, 31 patients were type 5 and 12 patients were type 6, respectively. Twenty-two patients had pelvic obliquity and 40 patients had shoulder asymmetry. Twenty-five patients had positive coronal balance and 18 patients had negative coronal balance. Twenty-one patients had positive sagittal balance and 59 patients had negative sagittal balance. Forty-four patients had trunk shift. Mean major coronal Cobb angle was measured 55.3 (range 32-109). Mean thoracic kyphosis angle was measured 32.9 (range 4-74), and mean lumbar lordosis angle was measured 43.6 (range 19-65). The mean follow-up period was 32 months. At the last follow-up the mean coronal Cobb angle was measured 11.1 (range 0-57), and coronal Cobb angle correction rate was % 79.9. At the last follow-up, only two patients had pelvic obliquity, and 16 patients had shoulder asymmetry. Eight patients had positive coronal balance and 7 patients had negative coronal balance. Eight patients had positive sagittal balance, and 52 patients had negative sagittal balance. Two patients had late infection and all of the implants were removed after the solid fusion. We have no neurological complication.

Conclusion:

The translation technique is safe and effective method in the treatment of adolescent idiopathic scoliosis. It provides good correction rate especially for coronal plane.

EP-50 POSTERIOR VERTEBRAL COLUMN RESECTION (PVCR) IN CONGENITAL THORACIC LORDOSCOLIOSIS

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Background&Aims:

Congenital thoracic lordosis (CTL) or lordoscoliosis (LS) are rare deformities which causes severe cardiopulmonary problems in early ages. In our practice we perform PVCR for treatment of this rare deformities. The aim of this retrospective study was to evaluate the results of PVCR in treatment of CTL or LS.

Methods:

9 patients (8M,1F), mean age of 11 years (4-20) with min 2 yrs f/up were included. The surgical technique included segmental pedicle screw fixation with long-arms for the apical and adjacent segments on concave side. Osteotomy was performed at the apex level starting from the concave side. After completion of resection, an over-kyphotic rod was placed for the first attempt of correction while a short temporary rod on convex side secured and avoided any translation. As tap screws were driven sequentially it pulled vertebral bodies backwards to the precontoured rod to create thoracic kyphosis. Over-kyphotic rod changed gradually to gain more kyphosis and in-situ benders were used for additional kyphotic effect in the final attempt. Titanium cage was used for reconstruction of residual anterior gap and H shaped femoral strut allograft placed over laminectomy site to prevent compression dura by hematoma. Preop and postop standing AP and lateral X-rays were measured for Cobb angles, sagittal parameters and diameter of thoracic cage.

Results:

Av f/up was 46.3 (24-88) months. Av preop thoracic lordosis of -14.3° (-24° - 11°) was restored to thoracic kyphosis of 17.6° (8° - 29°). Av preop Cobb angle of 38.4° (28° - 67°) was corrected to 9.8° (5° - 22°) with 77% correction rate. Av. resection was 2.11 (1-4) levels. The improvement of AP diameter of thoracic cage was 33% (25-47). The mean postop intensive care unit period was 1.3 (1-3) days and none of patients required prolonged respiratory device support. There was no infection, implant failure or pseudoarthrosis at the final f/up.

Conclusion:

Although it is technically challenging, current study demonstrated that it is PVCR is effective in restoring thoracic kyphosis in treatment of CTL or LS and avoids morbidity of combined surgeries.

EP-51 OUTCOME OF DEGENERATIVE LUMBAR SPINE TREATED WITH TRANSFORAMINAL LUMBAR INTERBODY FUSION

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Background&Aims:

To evaluate the outcomes, adjacent disc degeneration, operated disc space height, patient satisfaction with transforaminal lumbar interbody fusion for disc disease of lumbar spine.

Methods:

From 1995 to 2010, 28 patients with mean 51 (21-230) months follow-up who underwent TLIF were included in the study. There were 12 male and 16 female with mean age was 50 (31-70) years. Patients' diagnosis were degenerative disc disease (11), lumbar spinal stenosis (10) and spondylolisthesis (7). Banana interbody cage-allograft were used for TLIF. Pedicle screws were used for posterior stabilization and allograft was used for posterolateral fusion. Fusion was determined with computerized tomography (CT) at follow-up. On standard anteroposterior and lateral X-ray, disc space height, adjacent disc degeneration were determined. Patients' satisfaction was determined with Visual analogue scale (VAS) for pain and Oswestry Disability Index (ODI) for functional disability.

Results:

37 levels were fused with TLIF. Fusion was single level at 18 patients and two levels at 10 patients. Fusion level was between L3 and S1 segment. CT showed full union at all patients. Disc space height improved from 4.6 mm (2-7) to 11 mm (9-13) with TLIF. VAS improved from 7.3 (6-9) to 2.6 (1-4). ODI was improved from 75% (63%-90%) to 31% (11%-50%). Adjacent disc degeneration was determined at 10 patients. We have two complications such as dural tear (one patient) and superficial infection (one patient). Contralateral side foraminal stenosis was determined after operation at one patient. Four patients suffering from persistent low back pain that reduced with analgesics after operation.

Conclusion:

TLIF is a safe and effective treatment for degenerative lumbar disease

EP-52 DO AUTOGENIC BONE GRAFT FILLED CERVICAL PEEK CAGES ENHANCE FUSION RATES IN SHEEP MODEL ?

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Background&Aims:

We have compared the radiologic and biomechanical results of cervical discectomy versus discectomy and Interbody fusion with polyetheretherketon PEEK cage Implantation In sheep.

Methods:

7 sheep underwent only C3/C4 anterior discectomy and 7 sheep underwent anterior discectomy with PEEK cervical Interbody fusion cage filled with autologous Iliac cancellous bone graft. Direct X-ray analyses were performed routinely postoperatively 1 day, 4 and 8 week after surgery. After 12 weeks animals were killed and radiologic analyses and functional radiographic analyses were performed by computerized tomography than biomechanical tests were applied.

Results:

Although there were no statically significant differences between two groups regarding to fusion rates, functional radiographic and CT analyses, biomechanical parameters of young modulus, peak stress, yield strain, yield stress, yield force; disk space heights were found statistically lower In only discectomy group

Conclusion:

We have concluded that PEEK cages acted only as a spacer to maintain disc height In sheep discectomy model.

EP-53 THE ANALYSIS OF FUNCTIONAL AND RADIOGRAPHIC OUTCOMES OF CONSERVATIVE TREATMENT IN PATIENTS WITH LOW LUMBAR BURST FRACTURES

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Background&Aims:

The objective of this study was to evaluate the functional and radiographic outcomes of conservative treatment In patients with low lumbar burst fracture.

Methods:

15 patients (11 males, 4 females; mean age 32±8) who had low lumbar burst fracture treated with a custom-molded thoracolumbosacral orthosis (TLSO) with a thigh extension were enrolled. The mean follow-up period was 22±6 months. 14 patients were neurologically intact and one had isolated nerve root injury. There were 24% type A fractures and 76% type B fractures according to the system developed by Denis. Functional outcomes were evaluated by using Oswestry Disability Index (ODI), Short-Form 36 (SF-36) and Visual Analogue Scale (VAS). Radiographic outcome was analyzed by measuring anterior vertebral height loss, kyphosis angle, amount of canal retropulsion. Functional and radiographic outcomes were reviewed preoperatively and at 1., 3., 6., 12 month, and at the latest follow-up. Functional and radiographic improvements were analyzed statistically.

Results:

The mean bracing period was 11.9±1.7 weeks. The mean initial ODI, SF-36, and VAS score of patients was 78.3±9.6, 23.7±8.9, and 8.7±0.7, respectively. The mean ODI, SF-36, and VAS score of the patients at the final follow-up was 26.4±6.5, 68.1±11.2, and 2.8±1.7, respectively. The improvement in functional outcomes was measured to be significant. (P<0.05 for ODI, SF-36 and VAS). The mean initial anterior vertebral height loss, kyphosis angle, amount of canal retropulsion was found to be 27.2%±9.6%, -6.8°±3.2°, 37.4%±10.2%, respectively. The mean anterior vertebral height loss, kyphosis angle, and amount of canal retropulsion at the final follow-up was 23.1%±6.7%, -4.2°±2.4°, 19.6%±7.7%, respectively. Among the radiographic outcomes, the amount of canal retropulsion improved statistically (p=0.042).

Conclusion:

Conservative treatment with a custom-molded thoracolumbosacral orthosis with a thigh extension is a safe and effective method in patients with low lumbar burst fractures and can improve functional and radiographic outcomes.

EP-54 EFFICACY OF IN SITU LOCAL AUTOGRAFT IN ADOLESCENT IDIOPATHIC SCOLIOSIS SURGERY, COMPARISON OF THREE DIFFERENT GRAFTING METHODS

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Background&Aims:

Many types of grafting methods were reported for adolescent idiopathic scoliosis surgery in the literature. To the authors' knowledge, there have been no previous articles that compare in situ local autograft, local autograft with allograft and local autograft with posterior iliac crest autograft usage. This prospective randomized study is performed to compare the results of abovementioned grafting methods and to show the efficacy of in situ local autograft in adolescent idiopathic scoliosis patients who were operated between 2009 and 2011.

Methods:

Three groups were formed consisting of 65 (47 female, 18 male) adolescent idiopathic scoliosis patients whose mean age was 14 years 7 months (11 years 1 month- 17 years 11 months). Local autograft and allograft were used in Group A, only local autograft was used in Group B, and local autograft and posterior iliac crest autograft were used in Group C, and also posterior segmental instrumentation was applied to all patients. Mean follow-up was 28.5 (15-40) months. Patients were evaluated clinically and radiologically at follow-ups. In the first year control, pseudoarthrosis was investigated by computed tomography and bone scintigraphy.

Results:

No finding was observed indicating pseudoarthrosis in any patient in our study after clinical examination, plain radiographs, computed tomography and scintigraphy. Fusion was obtained in all patients at the end of follow-ups.

Conclusion:

Without the use of additional grafts, enough fusion can be achieved just with the use of local autograft for posterior spinal fusion in patients with adolescent idiopathic scoliosis.

EP-55 THE EFFECT OF VEPTR INSTRUMENTATION FOR PROGRESSIVE SPINE DEFORMITIES AND TIS IN INFANTILE CHILDREN

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Background&Aims:

This study evaluated the experience with the vertical expandable prosthetic titanium rib (VEPTR) device for two pediatric patients regarding thoracic insufficiency syndrome (TIS). In this study, postoperative measurements of Cobb angles showed significant improvement comparing the preoperative values, significant correction in chest wall vertical angle indicating an overall improvement in quality of life.

Methods:

Complex spine and chest wall abnormalities in two pediatric patients causing TIS was treated by using VEPTR. Patients with substantially reduced single or bilateral lung capacity, extreme scoliosis deformities, chest wall vertical angle and coronal imbalance were chosen for the operation. In both cases, hybrid and rib-to-rib VEPTR expansion thoracoplasty was performed. Postoperatively Cobb angle, coronal balance and space available for lung were evaluated.

Results:

We evaluated two patients who underwent VEPTR expansion thoracoplasty. Mean age at the time of operation was 29 months (27-52). Preoperative AP thoracic Cobb angle was 93° (90-97), early postop angle was 69° (63-75). Average follow-up was 34 months (30-38). In this period we lengthened the VEPTR of each patient about 6 times. Of the 2 patients who continued with lengthening, 3 experienced various complications. The following complications were observed: hook surfacing, broken rib and lamina and insufficient skin covering. Patients compliance was good.

Conclusion:

The main idea of the VEPTR treatment is to correct the volume depletion deformity of the thorax, and to maintain the correction until skeletal maturity for fusion can be considered. The purpose of VEPTR surgery is to follow the surgical strategy that provides the largest, most symmetrical, most functional thorax that can grow as normally as possible. As described by Campbell in VEPTR and its principles of use have become an important first step toward improving the quality of life and longevity of children with TIS. For infantile patients with severe chest wall deformity it is important to correct the deformity at an early age when lung capacity is rapidly developing. In this study, postoperative measurements of Cobb angles showed significant improvement comparing the preoperative values, significant correction in chest wall vertical angle indicating an overall improvement in quality of life. This method is useful for the initial treatment of pediatric patients to treat complex spine and chest wall abnormalities.

EP-56 CERVICAL SPINOLAMINOPLASTY (TURKISH OPEN-DOOR LAMINOPLASTY) WITH NEWLY DESIGNED TITANIUM MINI-PLATES

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Background&Aims:

One of the complications of cervical laminoplasty is the restenosis of the opened laminae. Weakness of the screws applied to laminae may cause restenosis. Here, we describe a new technique 'spinolaminoplasty' with newly designed titanium mini plate to keep the laminae opened.

Methods:

In the first group, mini plates were fixed to laminae as in the conventional method described by Hirabayashi (Fig. 1). In the second group, mini plates were fixed to spinous process to perform spinolaminoplasty (Fig. 2). Synthetic testing blocks made from UHMWPE 1000 were used (Fig. 3). Axial compression force was applied with a constant velocity; 5mm/min. Load and displacement plots were recorded by the aid of Instron 3300 testing machine.

Results:

Spinolaminoplasty method's stiffness was 10,4% greater than the conventional method

Conclusion:

One of the complications of cervical laminoplasty is the reclosure of the opened laminae. As in the spinolaminoplasty technique fixing the mini plates to spinous process with longer screws instead of laminae, strengthens the system compared to the conventional method. As shown on table 1, spinolaminoplasty method's stiffness was 10,4% greater than the conventional method. This proves that rigidity of novel construction model is more stable than the conventional method. Biomechanical study of the newly designed titanium mini-plate tested on synthetic model showed that using longer screws inserted to spinous process strengthens the system. Tight fixed laminae may prevent restenosis. Also applying the screw through spinous process instead of laminae may prevent the possible cord injuries.

EP-57 IS SACRALIZATION REALLY A CAUSE OF LOW BACK PAIN?

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Background&Aims:

The aim of this study was to determine, by plain radiography, if there is a relationship between sacralization and low back pain.

Methods:

Five hundred lumbosacral radiographs of low back pain patients and 500 control groups were examined. Data collection consisted of the subject's age at the time of imaging, gender, number of lumbar vertebral bodies, and bilateral height measurement of the lowest lumbar transverse process. Dysplastic transverse process were classified according to the Castellvi radiographic classification system. The incidence of sacralization in patients and the control groups was reported, and the anomaly was compared according to the groups.

Results:

Of these patients group, 106 were classified as positive for sacralization, resulted in an incidence of 21.2%. The most common anatomical variant was Castellvi Type IA (6.8%). In the control group, 84 were classified as positive for sacralization, resulted in an incidence of 16.8%. No statistically significant difference was found between the groups for having sacralization ($p=0,09$).

Conclusion:

The relationship between sacralization and low back pain is not clear. We found no relationship between sacralization and low back pain. This is a controversial situation in the literatures. Because of controversial future studies need to focus on identifying other parameters that are relevant to distinguishing lumbosacral variation, as well as corroborating the results obtained here with data from other samples.

EP-58 THREE-LEVEL ANTERIOR FUSION WITH TITANIUM CAGES -ALLOGRAFT AND PLATE GIVES SATISFACTORY CLINICAL AND RADIOLOGICAL RESULTS IN MULTILEVEL CERVICAL DEGENERATIVE DISC DISEASE

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Background&Aims:

To evaluate the clinical and radiological results after treatment with three-level anterior cervical discectomy and fusion (ACDF) with titanium cages-allograft and plate.

Methods:

We retrospectively analyzed the efficacy and outcomes of 19 consecutive patients treated with a 3-level anterior cervical fusion using titanium cages packed with allograft and anterior plate fixation. Patients were evaluated preoperatively and postoperatively using the visual analog pain scale (VAS), neck disability index (NDI) and radiographs.

Results:

There were 8 men and 11 women with a mean age of 58.6(47-70) with a mean follow-up of 13.9 months (12-21). The mean VAS score improved significantly from 7.3 points to 2.8 points ($p < 0.05$) at the final follow-up and the mean preoperative/postoperative NDI was 32.6 (7-42)/6,2 (0-24) ($p < 0.05$) at the final follow-up. Eighteen patients achieved a radiographic fusion, after an average time of 6.7 months.

The fusion rate of this procedure was 94.7%. Of 57 cages inserted, only three (5.2%) cages, in three patients were found to have subsided. There were radiolucent lines around 31 PEEK cages. 3 patients had dysphagia lasting for more than 3 days. The cervical lordosis in Cobb angles were 8.7/16.9 in the preoperative and postoperative periods respectively ($p < 0.05$).

Conclusion:

This procedure can effectively restore cervical lordosis, achieve high fusion rates and lead to clinically satisfactory outcomes with a low complication rate.

EP-59 THE EVOLUTION OF THORACIC VERTEBRAL SAGITTAL MORPHOLOGY DURING CHILDHOOD

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Background&Aims:

Studies regarding evolution of the spinal sagittal alignment reported decrease in thoracic kyphosis between 10 to 12 years of age in AIS. We have not come across a study investigating alterations in vertebral morphology or spatial orientation of vertebra which may cause this sagittal plane change in growing child. Lordotic alterations in apical vertebrae of scoliotic segments are observed in AIS. However, it has not been enlightened if these alterations are cause or result of the deformity. In this study, change of sagittal morphologies of T1-T12 vertebrae in children is investigated.

Methods:

105 children with normal vertebral alignment were included. Sagittal CT scans of the thoracic spine were obtained for each patient for indications unrelated to the spine. Anterior (A) and posterior (P) heights of T1-12 vertebra were measured. The children were separated into five groups: Group I (0-2 years of age), Group II (3-6 years of age), Group III (7-9 years of age), Group IV (10-12 years of age) and Group V (13-16 years of age). Differences in anterior and posterior heights according to age groups were documented.

Results:

Sagittal measurement of the A and P height changes of the T1-T12 vertebrae and rate of A/P for the vertebrae are shown separated according to age in Figure 1. The A and P height of the vertebral body of all segments show similar linear increases as the children grow ($p < 0.001$). The rate of A/P of all segments also shows similar changes with age increase. Rate of A/P of all segments increases in group III and shows lordotic angulation at T9-12.

Conclusion:

Significant changes are observed in sagittal morphology in all age groups. Anterior vertebral overgrowth is seen in group III (7-9 years). This change occurring in the ages where idiopathic scoliosis is thought to begin may cause a re-evaluation of the anterior overgrowth mechanism implicated in idiopathic scoliosis etiology.

EP-60 OUTCOME OF DEGENERATIVE LUMBAR SPINE TREATED WITH POSTERIOR LUMBAR INTERBODY FUSION

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Background&Aims:

To evaluate the outcomes, adjacent disc degeneration, operated disc space height, patient satisfaction with posterior lumbar interbody fusion for disc disease of lumbar spine.

Methods:

From 1995 to 2010, 28 patients with mean 82 (23-149) months follow-up who underwent PLIF were included in the study. There were 7 male and 22 female with mean age was 58 (21-77) years. Patients' diagnoses were degenerative disc disease (4), lumbar spinal stenosis (17) and spondylolisthesis (7). Banana interbody cage-allograft were used for TLIF. Pedicle screws were used for posterior stabilization and allograft was used for posterolateral fusion. Fusion was determined with computerized tomography (CT) at follow-up. On standard anteroposterior and lateral X-ray, disc space height, adjacent disc degeneration were determined. Patients' satisfaction was determined with Visual analogue scale (VAS) for pain and Oswestry Disability Index (ODI) for functional disability.

Results:

38 levels were fused with PLIF. Fusion was single level at 20 patients, two levels at 7 patients and four levels at one patient. Fusion level was between T12 and S1 segment. CT showed full union at all patients. Disc space height improved from 6,3 mm (4-11) to 11,3 mm (8-15) with PLIF. VAS improved from 7,4 (6-9) to 3,3 (1-6). ODI was improved from 74% (60%-91%) to 31% (11%-66%). Adjacent disc degeneration were determined at 9 patients. There was no complication during surgery or follow-up. One patient suffering from persistent radiculopathy that reduced with analgesics after operation.

Conclusion:

PLIF is a safe and effective treatment for degenerative lumbar disease.

EP-61 THE POSTERIOR VERTEBRAL COLUMN RESECTION OF THE VERTEBRAL OSTEOPOROTIC FRACTURES WHICH NEEDED ANTERIOR DECOMPRESSION

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Background&Aims:

The aim of this study is to present the results of PVCR for treating the osteoporotic fractures of the vertebra which needed anterior decompression due to spinal instability.

Methods:

Six patients (5 women, 1 man) with VOFs were treated by PVCRs with anterior expandable cage augmentation between 2009 and 2011. The mean age of the patients was 72,5 (range 62-82) years. All the patients were unable to walk when they had admitted to emergency room. The pain was assessed with a visual analog scale (VAS), and the mobility was graded as walking without difficulty (grade 1), walking with assistance (grade 2), and bedridden (grade 3).

Results:

A revision surgery was needed for one patient because of the subsidence of the cage. All of the patients experienced pain relief and improved mobility after surgery and during the follow-up period.

Conclusion:

PVCR is an alternative treatment method for the VOF's which needed anterior decompression.

EP-62 KRANIOSERVIKAL BİLESKE PATOLOJİLERİNDE OKSİPTOSERVIKAL FUZYON

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Background&Aims:

Kranioservikal bileşkeyle ilişkili patolojiler gelişimsel anomaller, Romatolojik hastalıklar, neoplazmlar, travmatik ve dejeneratif durumlar gibi oldukça geniş bir hastalık grubundan oluşmaktadır. Bu patolojilerde cerrahi tedavide çoğunlukla oksiptoservikal füzyon uygulanmaktadır. Kraniovertebral bileşkenin kendine has biyomekanik ve anatomik olarak kompleks bir yapı oluşturması cerrahi zorlayan faktörler olarak karşımıza çıkmaktadır. Bu çalışmada kliniğimizde oksiptoservikal füzyon uygulanan 17 olgu sunulmaktadır.

Methods:

Marmara Üniversitesi Norosirurji Anabilim Dalında Ocak 2009 ve Subat 2013 tarihleri arasında farklı patolojileri olan 17 olguya oksiptoservikal füzyon operasyonu gerçekleştirilmiştir. Onyedili olgunun 10'u erkek 7'si kadın olup yaş dağılımı 12 – 67 arasındadır. Tüm olgulara ameliyat öncesi ve sonrası dönemde kranioservikal bileşkeye yönelik MR, 3D BT ve Direk grafiler uygulanmıştır.

Results:

Özellikle preoperatif beyin sapı basısı olan olgularda postoperatif kontrol MR incelemeleri sonucunda beyin sapı üzerindeki basının ortadan kalktığı saptandı. Olguların boyun ağrısı VAS skorları ortalama 8'den 2'ye geriledi. Hiperreflekside gerilme ve parestezilerinde azalma takip eden ilk 6 hafta içinde izlendi. İki olgunun yara yeri problemi nedeniyle tekrar operasyonu gerekti ancak enstrüman disfonksiyonu görülmüdü.

Conclusion:

Kranioservikal bileşke patolojilerinde cerrahi düzeltmeyi sağlamak için oksiptoservikal füzyon zorlayıcı ancak etkin bir tedavi seçeneğidir. Tedavi edilmediği takdirde fatal seyir gösterebilecek bir patolojinin progresyonu durdurulabilmekte ve hızlı bir nörolojik iyileşme sağlanabilmektedir.

EP-63 ENDOSCOPIC ENDONASAL TRANSCLİVAL RESECTION OF THE ODONTOİD PROCESS

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Background&Aims:

Endoscopic endonasal transclival resection of the odontoid process is less invasive and safe than the transoral odontoidectomy.

Methods:

Case 1: A 23-year-old girl admitted with progressive walking difficulty and dysphagia. NE revealed 4/5 tetraparesis. CT scans revealed basilar invagination (Figure 1). Patient underwent a posterior procedure to obtain internal fixation using bilateral C1-2 transarticular screw placement and after this procedure endoscopic endonasal odontoidectomy, and resection of C1 anterior arcus were performed (Figure 2). Case 2: A 36-year-old girl admitted with progressive walking difficulty. NE revealed 3/5 tetraparesis. CT scans revealed clival spike (Figure 3). MR scans revealed compressing the clival spike and pathological signal on cervicomedullary junction (Figure 4). Patient underwent occipitocervical fusion between C0-4, suboccipital craniectomy and C1 laminectomy and after this procedure endoscopic endonasal odontoidectomy, and resection of C1 anterior arcus were performed (Figure 5). Spinal cord was monitored by neurophysiological study of motor and somatosensory evoked potentials.

Results:

The postoperative course was uneventful and tetraparesis improved for both cases, and, after 5 days, the patients were discharged.

Conclusion:

Endonasal transclival endoscopic approach is a feasible and effective method for treating CCJ congenital anomalies. Main advantages are; less CSF leak and prolonged intubation and no need for excessive tongue retraction and palatal incision.

EP-64 THE EFFICACY OF INTRAOPERATIVE SPINAL CORD MONITORING DURING SURGERY FOR SPINAL STENOSIS

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Background&Aims:

The comparison of the findings of spinal cord monitoring during posterolateral decompression and instrumentation for lumbar spinal stenosis with the clinical results obtained at postoperative 6th month.

Methods:

Twenty patients included in this study that were operated in our clinic because of lumbar spinal stenosis and monitored by intraoperative spinal cord monitor. The mean age of the patients was 69. The preoperative clinical evaluation however, was performed with SF36, Oswestry score and Visual Analog Scale (VAS). The decompression was applied to all patients after completion of posterolateral instrumentation during surgery. Interbody fusion was applied to one patient only. We used TcMEP's during the spinal neural monitoring and changes in amplitudes and latencies have been recorded. We evaluated the correlation of amplitude changes with the clinical results.

Results:

While the average preoperative VAS score of the patients was 8, it regressed to 1.8 postoperatively ($p=0.0001$). The average preoperative SF 36 score was 29.5 and it became 76.6 postoperatively ($p=0.0001$). The average Oswestry score was 65.5 and it regressed to 9.95 postoperatively ($p=0.0001$). A general rise in amplitudes of the TcMEP's was observed during surgery in all of the patients. TcMEP amplitudes raised more than 50% in fourteen out of 20 patients. They raised less than 50% in 6 of the patients. The amount of stenosis present and preoperative VAS scores of the patients were found irrelevant to group of patients whom amplitudes were raised less than 50%. ($p=0.156$, $p=0.079$).

Conclusion:

We observed that the motor evoked potentials of all patients were found raised during surgery and this raise was found conclusive with the affirmative clinical results achieved postoperatively.

EP-65 THE RELATION BETWEEN SAGITTAL MORPHOLOGY OF THE LUMBOSACRAL SPINE AND THE DEGREE OF LUMBAR INTERVERTEBRAL DISC DEGENERATION

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Background&Aims:

We investigated the relationship between the lumbosacral morphology and degree of intervertebral disc degeneration in a large sample of young patients.

Methods:

The magnetic resonance imaging (MRI) of low back pain patients referred to our department in 2008-2009 were retrospectively evaluated. A sample of 131 females between 20-30 years of age was studied. Patients were evaluated for the presence of intervertebral disc herniation or degeneration, and the degree of degeneration was assessed. Angles of lumbar lordosis, sacral table, and sacral kyphosis were also measured for each patient.

Results:

The degree of intervertebral disc degeneration increased in parallel to the decrease in the sacral kyphosis and lumbar lordosis angles, and to the increase in sacral table angle. A statistically significant difference with regard to the angles of lumbar lordosis, sacral kyphosis, and sacral table was determined between individuals with and without intervertebral disc degeneration. In addition, a statistically significant difference with regard to the angles of lumbar lordosis, sacral kyphosis, and sacral table was determined between individuals with and without intervertebral disc herniation.

Conclusion:

The degree and risk of intervertebral disc degeneration and herniation increases in parallel to the decrease in sacral kyphosis and lumbar lordosis, and to the increase in sacral surface angle.

EP-66 RADIOGRAPHIC ANALYSIS OF THE SAGITTAL PARAMETERS OF THE SPINES OF TURKISH PATIENTS: A PRELIMINARY STUDY

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Background&Aims:

Sagittal alignment of the spine is important in spinal balance and surgery. A retrospective study of several radiographic parameters of the sagittal profile of the spine was conducted to determine the values in Turkish population.

Methods:

Sagittal radiographs of the lumbosacral region of the patients made between July –December 2012 were evaluated. The sacral slope, pelvic incidence, pelvic tilt were measured. 258 patients older than 18 years, with no history of spinal or hip deformity or surgical intervention were included. For the statistical analysis Shapiro Wilks, parametric independent t-test Pearson correlation was used. $P < 0.05$ was considered significant.

Results:

Female and male ages were similar. ($p = 0.098$). Mean pelvic incidence, sacral slope and pelvic tilt in females were 48.800 ± 6.580 , 36.120 ± 6.210 , and 12.750 ± 4.540 respectively. In males they were 47.470 ± 6.100 , 34.090 ± 5.850 and 34.090 ± 5.850 . Pelvic incidence and pelvic tilt was not different between the females and males ($p = 0.093$) and ($p = 0.324$). Sacral slope was significantly different between the two sexes ($p = 0.007$). For all groups there was a non-linear positive relation between the age and pelvic incidence, sacral slope and pelvic tilt; ($p = 0.03$ $r = 0.135$), ($p = 0.30$ $r = 0.064$), ($p = 0.129$ $r = 0.095$).

Conclusion:

The sagittal plane alignment of the spine has become essential in spinal surgery. These values may serve as the basis for the sagittal plane parameters for the evaluation of pathological spinal conditions. They also designate the normal values to be reached and amount of correction required during spinal surgery.

EP-67 MIDDLE TERM THERAPEUTIC EFFECT OF THE SACROILIAC JOINT BLOCKAGE IN PATIENTS WITH LUMBOSACRAL FUSION RELATED SI PAIN. A COMPARATIVE STUDY WITH NON-OPERATED PATIENTS

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Background&Aims:

Sacroiliac (SI) pain after lumbosacral fusion is mostly result of a clinical entity termed 'distal adjacent segment degeneration'. Although this kind of pain is well described, treatment algorithms not discussed in literature. Purpose of the current study is comparison of the therapeutic effect of SI blockage in the patients with lumbosacral fusion and without fusion.

Methods:

Seventy-two patients diagnosed SI pain with blockage (Methylprednisolone and Lidocaine) enrolled to study. Twenty-two of them have history of lumbosacral fusion. Average follow-up time was 17.5 month (6-30). All patients were evaluated before and after the intervention with Visual Analog Scale (VAS), Oswestry Disability Index, Rivermead Mobility Index and SF-36. Results were statistically analyzed.

Results:

Except activity pain (a component of VAS) no statistical difference were observed between fusion and non-fusion groups ($p < 0.05$). Activity pain was better in non-fusion group ($p = 0.042$).

Conclusion:

In the aspect of functional status and life quality there is no difference between the groups. Therefore we can conclude that SI blockage has similar therapeutic effect on the patients with lumbosacral fusion when compared non-operated subjects. At least for middle term, considering the alternative treatment options is not necessary for patients with fusion related SI pain.

EP-68 SUPERIOR MESENTERIC ARTERY SYNDROME (SMAS) AFTER POSTERIOR INSTRUMENTATION AND FUSION FOR ADELOSAN IDIOPATHIC SCOLIOSIS

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Background&Aims:

Superior mesenteric artery syndrome (SMAS) is rare and serious pathology after spinal fusion surgery for scoliosis. This syndrome is acquired disorder in which acute angulation of SMA causes compression of the third part of the duodenum between the SMA and the aorta, leading to obstruction. Patients may present symptoms of gastrointestinal obstruction, such as upper abdominal distension, epigastric tenderness, nausea, postprandial vomiting and weight loss. Diagnosis must be complemented with an upper gastrointestinal barium-contrast radiography and computerized tomography that showed third part of duodenum compression by SMA.

Methods:

We report a case of 14-year-old girl who presented with postprandial abdominal pain at the epigastric region, nausea, postprandial vomiting and weight loss after posterior instrumentation and fusion for adenosan idiopathic scoliosis. She was operated with segmental pedicle screw and rod combination include thoracic 3 to lumbar 3 vertebra.

Results:

Patient was discharged with epigastric pain and nausea that resolved with medical therapy. Patient was referred same complaint and diagnosed SMAS after CT, upper gastrointestinal barium-contrast radiography. Endoscopically gastrojejunal tube placement was planned for passage but tubing could not be performed because of obstruction of third part of duodenum. Total parenteral nutrition was started for patient for hyperalimentation. Duodenojejunostomy was performed via laparotomy due to not resolving complaint.

Conclusion:

Gastrointestinal imaging is indicated when nausea and vomiting occur 6-12 days after surgery, associated with early satiety and normal bowel sounds. Initial treatment is conservative such as hyperalimentation and decompression. In severe case laparotomy is indicated.

EP-69 ANTERIOR CERVICAL DISCECTOMY AND FUSION WITH STAND ALONE CAGES IS SAFE AND EFFECTIVE FOR THE TREATMENT OF ONE OR TWO LEVEL CERVICAL DEGENERATIVE DISC DISEASE

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Background&Aims:

To evaluate the clinical and radiological results after treatment with anterior cervical discectomy and fusion (ACDF) by the stand-alone cage for one or two level cervical degenerative disc disease (CDDD).

Methods:

Data were retrospectively collected from a pool of 56 patients who underwent ACDF between 2009-2011. The patients who underwent single and double level ACDF with stand-alone cages were included in the study. Radiographic assessment was done by the lateral neutral, and lateral flexion-extension (F/E) radiographs. Cervical alignment and fusion were evaluated in the radiographs and patient based outcomes were assessed by visual analog pain scale (VAS) and neck disability index (NDI).

Results:

There were 5 men and 8 women with a mean age of 54.6(44-71) with a mean follow-up of 14.8 months (12-21). There was bony fusion in all patients at 6th month control. The mean preoperative/postoperative Cobb angles were 9,3/15.3 respectively. The cervical Cobb angle improved significantly. The mean preoperative/postoperative VAS scores were 7.1 (6-10)/3.1 (0-8) respectively. (p<.01) The mean preoperative/postoperative NDI was 28.6 (7-42)/8,2 (0-34). (p<.01)

Conclusion:

Stand-alone cages provide good stability and clinical improvement in patients with one or two level CDDD.

EP-70 LENKE TYPE 1 ADOLESCENT IDIOPATHIC SCOLIOSIS: EFFICACY OF CONSERVATIVE TREATMENT

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Background&Aims:

The definition of the scoliosis is precession of spinal column to lateral plane on coronal axis in conjunction with vertebral rotation. The treatment algorithm includes observation, brace treatment and surgery according to the curvature severity. This study was planned to investigate the efficacy of brace treatment and factors effected on treatment in Lenke type 1 adolescent idiopathic scoliosis.

Methods:

Thirty two patients with Lenke type 1 adolescent idiopathic scoliosis were included in our study. The three of them were operated after the progression of the curvature severity. The degree of curvatures of the other patients was calculated before beginning the treatment and during the treatment. The degree of curvature was improved after the beginning of treatment like the bending graphs.

Results:

The statistically significant differences were found among the all continuation measurements. ($p < 0.005$) When the beginning, at control and the last measurements of the curvature was evaluated, we determined that gender did not any efficacy to the treatment success. ($p > 0.05$) Also, we found that the type of scoliosis did not affect the efficacy of the treatment. ($p > 0.05$). We observed the degrees of the curvature was acceptable at the controls after the maturity.

Conclusion:

We think that brace treatment is a preventive conservative treatment of adolescent idiopathic scoliosis. In spite of the difficulties of usage, the brace treatment has superiority on the other conservative treatment methods.

EP-71 MULTIPLE VERTEBRAL COMPRESSION FRACTURES IN A 67 YEARS OLD WOMAN DUE TO OSTEOGENESIS IMPERFECTA TARDA TREATED BY MULTIPLE SEGMENT VERTEBROPLASTIES: A CASE REPORT.

, HAKAN CIFT, ERDEN ERTURER, MEHMET AYDOGAN, MEHMET TEZER

CEM SEVER

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Background&Aims:

To our knowledge, vertebroplasty with polymethylmethacrylate in a patient with osteogenesis imperfecta tarda who had multiple vertebral compression fractures has not been reported so far. We report a case of a 67 year-old patient with osteogenesis imperfecta tarda and multiple vertebral compression fractures at L1-L2 levels with undislocated posterior vertebral wall and additional older T4-L2 and L3-5 fractures.

Methods:

A 67 year-old patient with osteogenesis imperfecta tarda and multiple vertebral compression fractures at L1-L2 levels with undislocated posterior vertebral wall and additional older T4-L2 and L3-5 fractures. Using visual analog scale (VAS) the patient described severe lumbago without neurological deficits. Percutaneous vertebroplasty between T4-L5 was performed for the treatment of these fractures.

Results:

The visual analogue scale showed decrease of low back pain from 10 to 2 allowing mobilization with a walking frame. There was no neurologic complication. Radiologically there was no new fracture and no loss of height of the related vertebral segments was seen at 1 year follow-up.

Conclusion:

Vertebroplasty constitutes a minimal invasive therapeutic alternative in the treatment of vertebral fractures in osteogenesis imperfecta tarda and related pain, resistant to conservative treatment and pay dividends for prophylactic treatment of potential new fractures of the other vertebral segments.

EP-73 PYOGENIC SACROILIITIS

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Background&Aims:

Treatment and follow up results of bacterial sacroiliitis cases which is rare and hard to diagnose are evaluated.

Methods:

Five sacroiliitis cases consisting of three female and two male patients with the mean age of 56 are evaluated. One patient had sarcoidosis and one had diabetes mellitus. Preoperative and postoperative X rays, magnetic resonance imaging blood test results were examined.

Results:

Mean follow up time was 22 months. Preoperative biopsy was performed for two patients. Preoperative mean leukocyte count was 9120 per μL , mean C-reactive protein level was 35.71 mg/dL and mean sedimentation rate was 83.2 mm/sc. One patient received two stage debridement protocol in which antibiotic cement was utilized in the initial stage. One stage debridement was performed for the other cases. The organism responsible for sacroiliitis was defined as Mycobacterium tuberculosis in one case and Staphylococcus aureus in two cases whereas in two other cases organism could not be defined. At the last follow-up control mean Maceed score was established as 83.4.

Conclusion:

Hip pain, antalgic gait and fever are important symptoms in diagnosis of sacroiliac joint infections which is difficult to identify. Most frequent organism responsible for sacroiliitis was detected as Staphylococcus aureus. Tuberculosis must be kept in mind when sacroiliitis is suspected.

EP-74 HALO VEST TREATMENT FOR UPPER CERVICAL TRAUMA

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Background&Aims:

In this study we aimed to investigate the efficacy, long term result and associated complications of Halo Vest treatment for patients with upper cervical spine fractures.

Methods:

This study included 13 patients (11 men and 2 women) who applied Halo Vest treatment for traumatic upper cervical vertebral fracture between 2006 and 2011. We reviewed the radiological and clinical findings of patients before and after the treatment. Also we investigated the patient satisfaction survey.

Results:

Six of 13 patients had odontoid type 3 fracture, 2 patients had odontoid type 2 fracture with C1 type 1 fracture, 2 patients had odontoid type 2 fracture with Jefferson fracture, one patient had type 2 hangman fracture and two patients had unclassified C2 corpus fractures. Only three patients had neurologic disorder. Also three of the patients had pin site infection and one patient's pin was loosened. The mean follow-up time with Halo Vest was 14 weeks (10-21 weeks). Ten patients had bone fusion and the mean time of bone fusion was 12 weeks. Three patients with non-fusion were followed up by rigid cervical collar. Only six patients' response for satisfaction survey were 'yes'.

Conclusion:

Halo Vest treatment for upper cervical spine fracture is a safe and effective method but the patients' comfort and satisfaction are low.

EP-75 C1 VERTEBRAL FRACTURE IN A CHILD PRESENTING WITH TORTICOLLIS

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Background&Aims:

Fractures and dislocations in children are rare after minor traumas, because of structural difference in spinal column. Spinal trauma is detected in children less frequently than adults. The most common cause of spinal trauma in children is motor vehicle accidents while the second common cause is falling down from height. Detection of spinal traumas in children is extremely difficult, and SCIWORA is important to evaluate the children with spinal trauma. Proximal cervical vertebrae injuries are more frequent in younger children, while distal vertebrae injuries are more frequent in older children. We presented a case with a story of falling down from approximately 2 meters altitude 5 days ago, who had been carried by his family to the orthopaedic outpatient clinic because of pain and posture deformity.

Methods:

Eight-year-old male admitted to the orthopaedic outpatient clinic with a neck and back pain and posture deformity in his neck. His family explained that about 5 days ago he had fallen down from the roof of the cowshed which was approximately 2 meters high. They had immediately taken the child to the emergency service. Following the physical examination, the radiographs of his neck, head and abdomen had been taken. A probable IV contrast enhanced abdominal tomography had been performed. He had been discharged after 8 hours of observation in the emergency service without detection of any pathology in the X-ray graphs. The day after his discharge, his neck pain and posture deformity had started. His physical examination revealed cervical torticollis to the right side, increased proximal thoracic kyphosis and limited motion range of the neck to the right side. No neurological issues were found. Other system examinations were normal. Head, neck and thorax CT imaging were performed. Full spine was examined by MRI.

Results:

Cranial CT was normal. A suspicious fracture line left parasagittal on C1 vertebrae posterior arcus and wedge shaped in thoracic 4-9 vertebrae corpus were detected in CTs. MRI was taken due to pins and needles sensations in the left arm and compression fracture suspect in T4-9 vertebrae corpus. Cervical lordosis was increased, and wedge shape in T4-9 vertebrae was detected in MRI. Wedge shape was not considered as trauma due to the lack of edema. Soft tissue pathology was not detected on MRI. Neck brace was administered for two months. Torticollis improved after a follow-up period of 8 months. There was no limited range of motion in the neck.

Conclusion:

Falling from height is one of the most common causes of trauma in childhood. This may rarely cause spinal trauma in children. The features of their body structures must be taken into account when evaluating childhood trauma in emergency department. Spinal injuries may be without radiological evidence in children. It must be taken into consideration that every kind of injuries may be seen in traumas even if it's a rare situation. Existence of torticollis particularly in children with the history of falling from height requires more attention, and should be considered as upper cervical vertebrae injuries even though without any neurological findings.

, ALIHAN DERINCEK, VAHIT ERDA

EP-76 PYOGENIC SPONDYLODISCITIS AND AORTIC ANEURYSM

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Background&Aims:

Spondylodiscitis is a rare but serious bacterial infection and can result with deformity, instability, neurologic complications and sometimes death. In this case report, spondylodiscitis of the lower thoracic spine and concomitant aortic aneurysm is presented.

Methods:

A 62-year-old male patient was admitted to the emergency department with acute exacerbation of walking disability and numbness in the lower extremity, existing for one month. He had a history of pancreas tumor, stroke, coronary artery bypass and a stenting for aortic aneurysm 4 years ago. Neurologic examination of the patient revealed bilateral lower extremity paraparesis (Frankel Type D). MRI of the thoracic vertebrae yielded thrombosed aortic aneurysm (84mm) between T8 and T12 localisation which eroded anterior portion of T9-T10-T11 vertebral body, T9-T10 spondylodiscitis and epidural abscess. Laboratory blood tests at admission were white blood cell count 10300, CRP 131 mg/L and sedimentation 48mm/h. CT-guided percutaneous aspiration of the T9-10 intervertebral spaces was performed and 3 ml of pus was sampled for culture and pathology. Drainage catheters were placed in the disc spaces for 7 days. Methicillin resistant Staphylococcus aureus was isolated. Telcoplanin was started.

Results:

After 6 weeks of telcoplanin treatment, Infection markers were in normal limits, his neurology was normal and he was ambulatory. At 1-Year follow-up, patient recovered and he had no complaints.

Conclusion:

In patients with systemic illness, spondylodiscitis can accompany the primary disease. Here we presented a patient with spondylodiscitis and concomitant aortic aneurysm. We preferred minimal invasive treatment in this multimorbid patient with aortic aneurysm, pancreas cancer and serious cardiac problem

EP-77 A COMBINED SURGICAL APPROACH IN NEGLECTED POTT DISEASE: A CASE STUDY

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Background&Aims:

The first scientific definitions related to tuberculosis were made by Percival Pott in 1779 (1). Pott defined the disease as paraplegia together with a kyphotic deformity of the spine. Through its history, two important stages of treatment changed the course of the disease. The first was the anterior surgical approach to the spine defined by Ito et al in 1934 and the other was antitubercular chemotherapy agents found in 1954 (2). Radical anterior excision and fusion was popularised in 1956 by Hodgson and Stock (3). Tuberculosis today remains a significant cause of morbidity and mortality in under-developed countries. Of affected patients, 50% have spinal involvement. The most common micro-organism is *M. tuberculosis*. Hematogenous spread occurs generally from spinal focus or from another focus such as the pulmonary or genitourinary system. In spinal tuberculosis, the pathological findings are different from bacterial osteomyelitis. To protect the disc and eradicate the pathological findings in tuberculosis, a longer period is required. The formation of massive paraspinal abscess is more widespread in spinal tuberculosis. The presence of paraspinal abscess indicates active disease. The disease generally involves the thoracic spine. Neurological involvement may reach rates of 40%. The aim of treatment in spinal tuberculosis is to eradicate the disease and prevent spinal deformities and neurological deficits which may occur. Severe impairment in the neurological table and the development of paraparesis or paraplegia are certain indications for surgery. Medical treatment should start at least one week prior to surgery. However, in emergency situations surgery can be applied without starting medical treatment.

Methods:

A 31-year old male presented with severe back pain, weakness of the feet, loss of strength and swelling on the back. The patient was progressive, having had back pain for approximately 1.5 years and having been conservatively monitored on previous presentations to clinics. In the neurological evaluation, Frankel D was determined. A diagnosis of T11-12 Pott abscess was made from the results of clinical and radiological evaluations (Figures 1, 2).

Results:

Firstly, anterior T11-12 corpectomy+instrumentation was applied and at the second session, posterior instrumentation and fusion was performed (Figures 3,4). At the postoperative neurological evaluation, Frankel E was determined.

Conclusion:

In our clinic, generally anterior radical debridement and resection together with posterior instrumentation is applied, which is the most preferred surgical treatment method. Of the treatment choices, in terms of reducing morbidity, anterior vertebral column resection made from the posterior and posterior instrumentation is a surgical approach which may be applied. With increases in tuberculosis infections seen in every country of the world in recent years, attention has again turned to this disease (4). In patients with unrelieved complaints of back pain, it should be borne in mind in differential diagnosis.

EP-78 SPINAL CORD INJURY WITHOUT RADIOLOGICAL ABNORMALITY (SCIWORA) : A CASE REPORT

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Background&Aims:

The aims of this study were to report a 16 years old adolescent having the diagnosis of thoraco-lumbar SCIWORA with pelvic fracture by utilizing MRI and roentgenographic signs and to make a clarifying review on the articles in which the diagnostic criteria of this clinical entity were reported. Introduction Spinal cord injury without radiologic abnormality (SCIWORA) was firstly well documented by Pang and Wilberger in 1982. Different incidence rates between 4 % -66 % were reported in pediatric spinal cord injuries. But, much lower incidence rates (lower than 1 %) has been reported with the increasing development of MRI techniques. Recently, this lower incidence was reported surprisingly as low as 0.5 % in a series of pediatric spinal trauma: 3 out of 578 patients were diagnosed as SCIWORA. SCIWORA is observed most frequently in the cervical region of the vertebral column and children aged less than 8 years old. It is less frequent in thoracic and lumbar regions and older children. The diagnosis of SCIWORA is made by MRI.

Methods:

A 16 years old male patient was admitted to the emergency department, one and a half hour after a tractor had fallen down on him. He was evaluated promptly. The physical examination revealed hematoma in the pelvic region especially around the right iliac wing and paraplegia. After the stabilization of vital parameters, the radiological examination of both vertebral column and pelvis was performed. The X-Ray and MRI revealed the right ischium - superior pubic ramus and iliac wing fractures (Fig. 1) and edema of the spinal cord at T12, L1 and L2 levels (Fig. 2a and 2b), subsequently. Any radiological sign involving vertebral column such as extraneural compression or ligamentous injury was not detected. According to the classification of neurological loss, both extremities were graded as Frankel type A.

Results:

A high dose of methyl-prednisolone was administered (a bolus of 30 mg/kg IV, followed by infusion at 5.4 mg/kg/hr IV for the next 23 hours). Pelvic fracture was promptly fixed with an external fixator in the operating theater. A hyperextension brace with a three point support was put on the patient emergently. After a period of one year of follow-up, the neurological status of the patient showed progression to Frankel B. The urinary loss persisted. The patient continues to his life with wheelchair.

Conclusion:

The MRI sign has been a sine qua non for the diagnosis of SCIWORA. As a generally accepted view, the pathology should be limited to the spinal cord and besides should not include the signs as vertebral fractures, ligamentous complex injuries or extraneural compression. The pathology in the spinal cord should include one of the signs below: edema, hemorrhage and infarction. Transection and concussion were added to these signs and were associated with poor prognosis in those cases.

EP-79 ADMINISTRATION OF GROWING RODS IN A CHILD WITH NEUROMUSCULAR SCOLIOSIS: HAMZAOGLU TECHNIQUE

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Background&Aims:

Development of early-onset scoliosis (EOS) in neuromuscular cases results in impaired quality of life due to serious respiratory and cardiovascular problems before adolescence period and limited physical functions. Therefore, the techniques allowing for spinal growth are preferred in early periods. We presented the outcomes of a new technique allowing for growth in a male child with congenital paraparesis and progressive EOS.

Methods:

Eight year-old male child with congenital motor paraparesis, who had never walked but could sit up without support, had progressive scoliosis and bilateral knee flexion contractures. He had undergone hamstring release surgery for knee flexion contractures in order to provide a better mobilization by wheelchair. Since he had experienced a significant progression of scoliotic deformity during the last year, pedicle screws allowing for spinal growth by posterior adjustments and growing rods were implanted to every segment between T2 and L5 vertebrae without affecting the facet joints. Three pedicle screws were locked both at proximal and distal regions. Screw heads were left loose at the intermediate segments between T5 and L2. Fusion was not administered at any level. Brace was given for three months postoperatively, and at the ninth month, fusion process was completed following lengthening in the same session.

Results:

Control examination revealed displacement of some of the loose screw heads and increase in the curve. This showed us the effects of rods for spinal growth and the growth of the spine without any limitation. Facet joints were observed open during the lengthening process. The patient's compliance was very good following both of the surgeries. AP Cobb angle was improved 82% (10°) on postoperative month 15 (9+6), which was 56° preoperatively. It was observed that he could easily sit up without support, perform daily activities, go to the school, and swim, and he could adapt the social life.

Conclusion:

Treatment of EOS depended on the principle of allowing caudal and cranial growth (Shilla) during the correction of the deformity including instrumentation by the fusion of the apical region of the curve, or dual-single growing rods. Hamzaoglu presented a new technique, and described that the method without any fusion at any level, using only proximal and distal lock and leaving intermediate level screws loose, and performing rod lengthening periodically would be effective. As we observed in our case, this method can be used effectively in early-onset neuromuscular scoliosis.

EP-80 POSTERIOR SPINAL FUSION IN ADOLESCENT IDIOPATHIC SCOLIOSIS WITH OR WITHOUT INTRAOPERATIVE CELL SALVAGE SYSTEM

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Background&Aims:

This study investigates efficacy and safety of routine cell salvage system use in adolescent idiopathic scoliosis patients undergoing primary posterior spinal fusion surgery with segmental spinal instrumentation.

Methods:

Forty-five consecutive adolescent idiopathic scoliosis patients undergoing posterior spinal fusion by two surgeons at a single hospital were studied. Intraoperative cell salvage system was used in 23 patients, and the control group was 22 patients who underwent surgery without cell salvage system. The cell salvage system was the Haemonetics Cell Saver 5. The primary outcome measures were intraoperative and postoperative allogeneic transfusion rate, difference between preoperative and discharge Hg and Hct levels.

Results:

Average patient age was 14.65 ± 1.49 in cell saver group and 13.86 ± 2.0 in control group. In cell saver group, average intraoperative autotransfusion was 382.1 ± 175 ml. Average postoperative allogeneic blood transfusion need was 1.04 ± 0.7 unit in cell saver group and 2.5 ± 1.14 unit in control group. No transfusion reactions occurred in either group. Average hemoglobin level in cell saver group was 10.7 ± 0.86 and average hemoglobin level in control group was 10.7 ± 0.82 on discharge. Cell saver reduces postoperative transfusion rate in patients undergoing posterior spinal fusion for adolescent idiopathic scoliosis.

Conclusion:

As a conclusion, this study showed that cell saver reduced postoperative transfusion rate for posterior spinal fusion in AIS.

EP-81 LONG-SEGMENT ACUTE SPINAL EPIDURAL HEMATOMA FOLLOWING SPINAL ANESTHESIA

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Background&Aims:

Acute spinal epidural hematoma requires immediate diagnosis. In order to prevent progressive neurodeficit and permanent neurological sequelae, early diagnosis and immediate decompression of the spinal cord is the most effective treatment on neurological recovery.

Methods:

After the endoscopic knee surgery performed under spinal epidural anesthesia, 55-year-old female patient admitted because of back pain, gradually increasing lower extremity weakness, and inability to move. Neurological examination revealed paraplegia.

Results:

Spinal magnetic resonance (MR) imaging revealed epidural hematoma posteriorly compressing the spinal cord at the level of Th4-L4. (Fig. 1,2). Due to the existing neurological status operative treatment was pursued. Th4-L4 laminectomy was performed and the hematoma was evacuated (Fig. 3). Lower limb motor power was increased to 3/5 in the postoperative neurological examination. At the 6 month controls, it was observed that no spinal instability developed and the patient became able to walk with walker. Postoperative MR revealed no hematoma at the epidural space (Fig. 4).

Conclusion:

Long segment spinal epidural hematoma following spinal epidural anesthesia is rare in the literature. And through this case, we have emphasized the importance of MRI in diagnosis as well as the impact of early surgical treatment on neurological recovery.

EP-82 CERVICAL POTT'S DISEASE

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Background&Aims:

Cervical spinal tuberculosis is a rare variant of extra-pulmonary tuberculosis. We report the case of a patient with tuberculosis C5-C7 spondylo-dysclitis complicated by a spinal epidural abscess.

Methods:

We present the case of a 63-year-old man who was admitted to the Department of Neurosurgery because of progressive paraparesis. On admission to our service, he was found to be in severe pain and neurological impairment with motor and sensitive deficit. The MRI scan revealed severe instability with destruction of the fourth, fifth and sixth vertebrae and prevertebral and anterior epidural soft tissue mass suggesting abscess formation. Surgical exploration of the spinal lesion was done by anterior approach. Drainage of the abscess and radical debridement by corpectomy of C5, C6 and C7 was followed by anterior fusion via bone grafts within titanium mesh. The tuberculous nature of the lesion was confirmed histopathologically and treatment with four drug antituberculous chemotherapy that began previously was maintained. The patient exhibited complete recovery at follow-up examination and was mobilized on a Philadelphia cervical neck brace after one week. Stabilization through posterior approach had to be kept for a later date because of deterioration of general status.

Results:

Cervical Pott's disease may present with bony deformity, local symptoms of pain and features of neural compression. Our aim is to recall the diagnostic aspects and notably the neuroradiological findings in this particular localization of Pott's disease.

Conclusion:

Earlier diagnosis and treatment of cervical Pott's disease is possible with awareness of the manifestations of affected patients.

EP-83 GIANT CORTICAL BONE ISLAND AT L2 CORPUS

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Background&Aims:

In this abstract, we aimed to present an incidentally discovered giant cortical bone island mimicking a bone forming tumor of a totally asymptomatic patient.

Methods:

51 year old male patient. A sclerotic lesion at left half of L2 corpus was discovered incidentally on a plain abdominal X ray during a urological work up. Further imaging with MRI and CT revealed a cortical bone mass of 3x3x3 cm dimensions on the anterior aspect of left L2 pedicle without cortical expansion or destruction. There were no marrow edema on the neighbouring structures. 3 phase technetium scan was normal.

Results:

Since our patient was totally asymptomatic, no other diagnostic follow up was made including biopsy. Patient will be followed up annually.

Conclusion:

Bone Island of spine is a frequently encountered entity that may be confused as a bone forming tumor, especially when it is too big such as this case. Although our patient was totally asymptomatic, theoretically such sclerotic mass may result with a stress riser and may possibly predispose a fracture in advance at the involved or adjacent levels.

EP-84 OSTEOPOROTIC MULTIPLE VERTEBRA FRACTURES IN PREGNANCY: TRANSIENT OSTEOPOROSIS.

_____ METIN OZALAY

BASKENT UNIVERSITY ADANA CLINIC AND RESEARCH CENTER

Background&Aims:

Transient Osteoporosis associated with pregnancy or lactation is a rare condition. The incidence of this problem is unknown but it can cause one or more vertebral compression fractures. Our purpose is to present a case with osteoporotic multiple fractures in pregnancy due to transient osteoporosis.

Methods:

22-year-old woman admitted to our hospital with back pain started at last trimester of pregnancy and continued at the lactation period. She has no systemic illness or metabolic bone disease. Her physical examination revealed local tenderness in thoracic region with normal neurology. MRI study showed edema at T8, T9 and T10 compression fracture levels. Brace treatment was done. With Calcium and Vitamin D supplement, her complaints decreased.

Results:

At 1 year old follow-up, she had no clinical complaints.

Conclusion:

We present here unusual case of pregnancy-associated compression fractures treated conservatively.

EP-85 DEGENERATIF LOMBER OMURGA PROBLEMLERİNDE WILTSE GİRİSİMİ İLE ENSTRUMENTASYON

_____ HALUK OZSARAC

CENTRAL HOSPITAL

Background&Aims:

AMAC: Degeneratif omurga problemlerinin CO2UmUnde kullandığımız Wiltse Approach'un pratik, kullanışlı bir girişim olduğu, 13 olguluk degeneratif omurga olgularının sonuçları ile gösterilmeye çalışılması.

Methods:

YONTEM: Mayıs 2011 ile Temmuz 2012 tarihleri arasında degeneratif lomber spine tanısı ile opere ettiğimiz, instrumentasyon uyguladığımız 13 olgunun 9'u kadın, 4'u erkek, yaş ortalaması 52, hastalık süresi 4 ay ile 6 yıl arası değişiyor. Preop normal grafiler, lomber fleksiyon- ekstansiyon grafileri, lomber MR çekildi. Olguların tümünde Wiltse insizyonu kullanıldı. Posterlor stabilizasyon uygulanan olgulardan 7 sinde cage uygulandı. 6 olguda parsiyel laminektomi, olgularda 1-3 seviye mikro diskektomi, 6 olguda foramnotomi uygulandı. Ortalama izlem süresi 11 ay (6-17 ay). Olgular postop, 6 hafta ve 6 ay ara ile izlendi. Post-op X-Ray ve CT ile, daha sonra klinik ve X-Ray ile değerlendirildi. Olguların sonuçları VAS ağrı skorlama ve Oswestry hastalık indeksi sistemleri ile değerlendirildi.

Results:

BULGULAR: Wiltse approach'un giriş yolu olarak kullanıldığı olgularda paraspinal kas hasarının az olması, pedikül vida uygulama yerine ulaşma kolaylığı sağladığı, postop VAS skorlarına olumlu yönde etki ettiği görüldü. VAS skorlarına göre ortalama 8.4 olan preop değerler, 2.1 post-op değeriyle indi. Oswestry indeksi preop % 81 iken post-op % 20. Postop 1 olguda, vida pedikül yerleşim problemi ne bağlı hafif nörolojik bulgu tespit edildi. Revizyona gerek görülmeydi. Olgularda iyi-mükemmel olgu oranı % 88.

Conclusion:

SONUC: Degeneratif lomber omurgada Wiltse approach kullanışlı ve sonuçları olumlu yönde etkileyen bir girişimdir. Uygulama kolaylığı, kas hasarının az olması önemli avantajları. Posterlor segmental stabilizasyon ile korunan disk aralığı sayısı lomber hareketli olumlu etkiler. Bu yöntem ile degeneratif lomber spinal cerrahi sonuçları tatmin kardır.

EP-86 THORACOLUMBAR BURST FRACTURES WITHOUT NEUROLOGICAL DEFICIT: THE EFFICACY FOR CONSERVATIVE TREATMENT.

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Background&Aims:

Approximately of %90 vertebral fractures are in the thoracolumbar junction. Patients with unstable fractures and neurological deficits are treated with surgery, stable fractures without neurological deficit are treated with conservative methods.

Methods:

Thirty nine patients (13 male, 26 female) with compression fractures were treated conservatively and evaluated retrospectively. All the patients were evaluated with X-rays and computerized tomography. Local kyphosis and sagittal Index angles were measured. Thoracolumbosacral hyperextension orthosis was used for all the patients for 4 months. Local kyphosis and sagittal Index angles were also measured with control X-rays at the follow up. The functional results were evaluated with Denis' pain and work scale.

Results:

The mean values of the local kyphosis and sagittal Index are $20,53 \pm 4.8$ ve $10,56 \pm 3.78$ degrees at the first visit. The mean values of the local kyphosis and sagittal Index are $20,56 \pm 4.5$ ve $10,61 \pm 3.8$ degrees at the last follow up. These values were not statistically significant. ($p > 0.05$) The mean values of the pain scale are 3.64 ± 0.48 and the mean values of returning to work scale are 2.51 ± 0.60 at the first visit. There were not any differences between the beginning and the last follow up scales.

Conclusion:

The conservative treatment of the compression fractures of thoracolumbar junction is still an alternative treatment method. Finally we think that it is an effective method in the treatment of fractures which are stable compression fractures with local kyphosis and sagittal Index under 30 degree.

EP-87 HEMANGIOMA OF THE THORACIC VERTEBRA

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Background&Aims:

Hemangiomas are benign vascular tumors that are most commonly discovered as incidental findings in the vertebral column. We present a case of a hemangioma located in the second thoracic vertebra with aggressive behaviour and non-typical findings in the radiological examination, mimicking a malignant tumor.

Methods:

A 30-year-old woman presented with neuropathic pain and paraesthesia, numbness and weakness within the left arm. There was mild pain in the cervicothoracic spine, which had been present for 3 years. Past medical history was entirely unremarkable. Secondary to an infiltrative mass of T2 vertebra causing mass effect on the spinal cord and extending laterally into the neural foramen. Radiologically, an infiltrative mass of T2 vertebra causing mass effect and extending laterally into the neural foramen suggestive of malignant neoplasm was diagnosed. Intraoperatively, a yellowish tumor with fibrous outer lining was filled with a soft, cheese-like material. The tumor was resected without disruption of the pars interarticularis, avoiding spinal stabilization surgery. Histology revealed abundant dilated and engorged vascular channels within a matrix of dense hyalinized fibrous tissue, with lobulated composing vascular structures compatible with hemangioma. Cellular atypia and mitosis were not detected.

Results:

Hemangiomas are the most common primary tumors of the spine. Infrequently they are characterized by extra-osseous extension, bone expansion, disturbance of blood flow and rarely compression fractures.

Conclusion:

Hemangiomas should be taken into account as a reason for local or radicular pain and neurologic deficits. Recognition of their aggressive variance will be useful to make the appropriate treatment.

EP-88 LONG CERVICAL COSTAE ARTICULATING WITH THE FIRST RIBS: A RARE CASE PRESENTING WITH NEUROGENIC TOS

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Background&Aims:

Signs and symptoms caused by compression of brachial plexus and subclavian vessels in the cervicoaxillary region is known as thoracic outlet syndrome (TOS). Bones and the surrounding soft tissues may play a role in its pathogenesis. Bony factors include the long transverse process of the seventh cervical vertebra, a cervical rib, an anomalous first rib, or fractures of the clavicle or first rib. The most common symptoms of TOS patients are pain and paresthesias in the supraclavicular, interscapular, subscapular, and cervical regions or in the upper limbs.

Methods:

A 16-yr-old woman was seen for numbness and a tingling sensation in her left hand and pain in the left shoulder and supraclavicular region that had persisted for 2 years. Physical examination revealed ulnar hypoesthesia on the left side, and provocative maneuvers for TOS were positive. Cervical radiographs were taken as the initial step for radiologic diagnosis and evaluation. Posteroanterior views suggest an anomalous cervical rib and 3D CT clearly demonstrated it. We performed surgical treatment with supraclavicular approach for this patient and excised the left cervical costa.

Results:

All symptoms had disappeared in the first control, 10 days after surgery.

Conclusion:

This case is one of the few cases in which purely neurologic symptoms have arisen from a cervical costa articulating with the first rib. In conclusion, cervical ribs articulating with the first rib must be kept in mind in the differential diagnosis of TOS and surgical treatment with excising the cervical rib is a good choice of treatment.

EP-89 CHARCOT SPINAL ARTHROPATHY DUE TO CONGENITAL INSENSITIVITY TO PAIN: A CASE REPORT.

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Background&Aims:

Our aim is to present a patient with Charcot spinal arthropathy and congenital insensitivity to pain as a rare cause of it.

Methods:

Congenital insensitivity to pain is very rare. We present the case of a 23-year-old pain-insensate boy who developed severe Charcot arthropathy at L5-S1 level. He had been diagnosed as congenital insensitivity to pain at 1 year old. When he was 18 years old he had broken his femur and 5 cm limb leg discrepancy developed. While a limb lengthening operation was planned, severe bilateral lower extremity numbness started with his both legs and right side drop foot. Clinical and radiographical investigations demonstrated severe Charcot arthropathy at L5-S1 level with L5 and S1 vertebral collapses. Posterior spinal instrumentation, posterior decompression by laminectomy and posterolateral strut graft augmentation was done for the treatment.

Results:

At 1-year follow-up fusion was achieved and neurological symptoms were improved.

Conclusion:

The main causes of Charcot spine are infections, trauma and tumoral conditions. Congenital insensitivity to pain should be thought in differential diagnosis.

EP-90 LAPAROSCOPIC DRAINAGE OF PRESACRAL ABSCESS

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Background&Aims:

Presacral abscess occurs as a complication of spinal osteomyelitis. Percutaneous drainage is performed under the guidance of CT, ultrasonography or fluoroscopy, but percutaneous drainage of a presacral lesion is associated with the risk of damaging adjacent structures such as bowel, urinary bladder, internal genitalia, muscles, nerves, and vessels. Through our experience, presacral abscess can be safely and effectively managed by laparoscopic procedure, thereby minimizing the risk of injuring adjacent structures.

Methods:

The cause of abscess were spinal tuberculosis and post-operative pyogenic spinal infection. Laparoscopic surgery was performed using 3 trocars (10mm in umbilicus, 5mm in flank and suprapubic area) After approached the abscess wall, an incision was made on the abscess, drained the pus and biopsy was performed. A drainage tube was inserted into the abscess cavity.

Results:

Two cases can be drained without difficulties. No complication was observed during the 15-month and 2-year follow-up period.

Conclusion:

We report the case of 2 patients who underwent laparoscopic drainage of presacral abscess due to spinal infection.

EP-91 BILATERAL TRANSPEDICULAR IRRIGATION UNDER LOCAL ANAESTHETIC IN MULTI-LEVEL THORACIC VERTEBRAL OSTEOMYELITIS

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Background&Aims:

Vertebral osteomyelitis is defined as an infection of the vertebral mass. The greatest risk factor is a weakened immune system. In the case presented here, general anaesthesia could not be applied so antibiotic therapy increased the effectiveness of the vertebral section irrigation with a percutaneous transpedicular approach.

Methods:

A 32-year old female presented with back pain and complaints of difficulty walking. The patient's anamnesis revealed a diagnosis 6 months previously of acute pancreatitis and sepsis for which she was monitored in Intensive Care Unit. Physical examination and tests determined sedimentation rate 83mm/sec, CRP 45.2 (N 0-10), and on thoracic vertebrae MRI, the spread of bone marrow to the thoracic 10,11,12 vertebrae corpus and findings consistent with bone marrow infarct. In transpedicular aspiration of the T10 vertebra made under local anaesthetic, 5cc of purulent fluid was taken. There was Pseudomonas aeruginosa proliferation in the culture. Despite long-term parenteral administration of wide-spectrum antibiotics, the patient did not recover clinically.

Results:

As the general health status of the patient did not allow for surgical debridement, 0.9% isotonic 500cc irrigation was performed at each level of T10-11 and 12 vertebrae with a bilateral transpedicular approach using a biopsy needle under local anaesthetic. In the second week after the debridement, the level of infection was seen to have receded. The patient was mobilised after debridement. The complaint of back pain was completely resolved. The patient was seen to have a significant clinical recovery.

Conclusion:

Vertebral osteomyelitis is generally treated with surgical debridement and antibiotics. Very few patients see a benefit from antibiotic treatment alone. In this case of vertebral osteomyelitis, as the general health status did not allow for surgical debridement, irrigation was made with a percutaneous transpedicular approach under local anaesthetic. The antibiotic treatment was seen to increase the efficacy of the irrigation of the infected vertebral mass. This method can be recommended as beneficial in the treatment of patients with similar characteristics to those of the case presented here.

EP-92 LOST VERTEBRAL BODIES; A NEGLECTED CASE OF TUBERCULOUS OSTEOMYELITIS AT THORACAL SPINE

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Background&Aims:

Pott disease is one of the major causes of spinal deformities related with vertebral osteomyelitis. These cases may be surgically treated for increasing life quality and relieving the complaints related with deformity.

Methods:

A 36-year-old woman admitted to our department with complaints of pain at her both lower extremities and lumbar region. She expresses difficulty of walking since three years and breathing since one year. She had a history of pulmonary tuberculosis when she was 14-years-old. At follow up period she had pain and swelling on her back and Pott abscess was diagnosed. But her family refused further treatment after a period of medical treatment and got out of control. Drainage from a fistula was started few years later and she appealed to physician and medical treatment started again but she finished the treatment and got out of control again when symptoms and drainage finished. After physical and radiological examination we detected the 79 degrees of kyphosis angle. The horizontal distance between C7 and S1 vertebrae is 3,3 cm. ASIA neurologic score was noted as D. Fusion of all seven bony segments between 5 to 11 thoracic vertebrae is detected. We applied posterior instrumentation and fusion, and laminectomy to segments between T5 to T12. No signs of persistent infection detected.

Results:

Symptoms resolved into two weeks after surgery.

Conclusion:

Tuberculosis is a common, worldwide health problem that is caused by *Mycobacterium tuberculosis*. Neglected or delayed treatment is the main cause of spinal deformities in case of vertebral column tuberculosis. These deformities are generally severe and have high degrees of kyphosis angle. Approximately 20% (10-60) of Pott cases may have neurological symptoms. Different treatment modalities described for this type of severe spinal deformity. Anterior and posterior combined instrumentation and additional posterior column resection is the most common way of surgical decompression. We wanted to present and share a case of neglected Pott disease and bony destruction related with persistent untreated osteomyelitis. Surgical intervention can be helpful for symptomatic cases.

EP-93 DIFFUSE IDIOPATHIC SKELETAL HYPEROSTEOSIS AND CERVICAL SPINAL STENOSIS:CASE REPORT

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Background&Aims:

Diffuse idiopathic skeletal hyperostosis (DISH) is a disease of unknown etiology which is encountered over 5th decade and characterized with ossification of the anterior and lateral part of the vertebral body. Spine, thoracic 97%, lumbar 90%, Cervical vertebrae 78% and also 70% of all three spine segmental involvement could be seen. The most common presenting symptoms secondary to DISH are pain, stiffness, limitation of movement, and dysphagia due to compression of the esophagus. DISH is associated with type 2 DM and obesity. Plain radiography, CT and MRI can help to demonstrate pathology.

Methods:

Our case is 67 year old male patient, fell from a month ago and followed by another center with complaints of swallowing and breathing difficulties and weakness of upper and lower extremities. Neurological examination revealed quadriplegia and he could feel the pain. A cervical spine MRI showed fracture of C4-5 vertebrae and cervical spinal stenosis (Figure 1). At the first surgery, C3-4 total, C2 and C5 partial laminectomy and C3-C4 fusion with lateral mass screws performed. One week after the first surgery, C3-4 discectomy, and fusion with cage and anterior plate system performed (Figure 2-3).

Results:

Differential diagnosis of DISH, ankylosing hyperostosis, Forestier disease and ligamentous spondylitis ossificans should be considered. In the treatment of DISH conservative measures are usually in the foreground. Surgery could be performed at neurological disorders.

Conclusion:

As a result, DISH should be remembered as the underlying cause of patients presenting with quadriplegia, dysphagia and paresthesia clinic.

EP-94 ARE THE SYRINGOMYELIA AND SYRINX DIFFERENCE CONDITIONS?

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Background&Aims:

Syringomyelia and syrinx are used in the same sense in the literature. There is no difference in definitions. Sometimes syrinx is used as collective name of hydromyelia and syringomyelia. In hydromyelia, there is dilatation of the central canal of the spinal cord, but in syringomyelia and syrinx, there is dissection through the ependymal lining of the central canal and a cerebrospinal fluid (CSF) collection within the cord itself. Primary syringomyelia may be a consequence of traumatic injury, inflammatory conditions, or compressive lesions with foramen magnum or spinal pathologies that impede CSF flow. Although expansion of the cyst cavity often causes a clinical situation as progressive neurologic deficit like pain, sensory loss, weakness, and autonomic dysfunction, in many cases it is an incidental finding. Although it is not clearly defined, the general consensus seems to be that idiopathic syrinx is not associated with any of the conditions mentioned previously. The management and natural history of such idiopathic syrinxes remain unclear.

Methods:

The study was approved by the review board for patients seen in our neurosurgical clinics with a diagnosis of syringomyelia or idiopathic syrinx. The patients with syringomyelia had evident etiology such as CM-I, tumor, trauma, or postlaminectomy adhesions. The patients with syrinx had no evident etiology. All the patients were evaluated with neurological examinations and MRI during the follow-up period.

Results:

A total of 21 patients were identified. The mean age was 39.3 years (25–61 years), and there were 14 men and 7 women. 11 of patients had idiopathic syrinx, and the others had syringomyelia. The patients with syringomyelia had evident etiology. The forms, etiology, measurements, the sign and symptoms, the radiologic follow up and the electrophysiologic changes are different.

Conclusion:

We think that the syringomyelia and syrinx are the difference conditions. The causes of formation, the shapes and the radiologic and clinical findings, and the of these two forms were different. Here, we present our experience with syringomyelia and idiopathic syrinx in a retrospective case series and we provide a comprehensive review. We also discussed the differences between these two conditions with the current evidences and as a result formulate guidelines to assist neurosurgeons who encounter this pathological entity. The pathophysiology of syringomyelia is currently debated, and several hypotheses may account for the various subtypes, so we did not discuss now.

EP-95 POSTERIOR ONLY TREATMENT OF SCHEUERMANN KYPHOSIS WITH PEDICLE SCREW INSTRUMENTATION IN 20 PATIENTS: RADIOGRAPHIC OUTCOMES, COMPLICATIONS

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Background&Aims:

Operative management has been advocated for adolescents with progressive kyphosis measuring over 70° angle. Surgical options include posterior spinal arthrodesis with or without anterior spinal release. In recent years posterior only instrumentation and posterolateral bone graft fusion are the most popular treatment choice of the treatment of the Scheuermann Kyphosis.

Methods:

Between the years 2005 and 2013, with a mean follow-up period of 41.5 months, 20 cases of Scheuermann Kyphosis with mean age of 21 were treated by one-stage posterior only all pedicle screws instrumentation combined with posterior bone graft fusion. The changes in terms of the Cobb angle, sagittal and coronal balance parameters of spine, bone fusion rate, SRS 30 scores and complications were observed.

Results:

Pre op, early post op and the final stage of follow-up period radiographs were available for all patients. Preoperative median values were 79,85° for thoracic kyphosis, 72,8° for lumbar lordosis, 6,1 mm for sagittal balance and 1 mm for coronal balance. Immediate postoperative median values were 54,95° (P<0.05) for thoracic kyphosis, 54,65° (P<0.05) for lumbar lordosis, 2,7 mm for sagittal balance and 4,85 mm for coronal balance.

At the final of follow-up, median values of thoracic kyphosis, lumbar lordosis, sagittal balance and coronal balance were 55,65°

($P > 0.05$), $56,35^\circ$ ($P > 0.05$), 12,6 mm and 3.95 mm respectively. Posterior spine fusion rate was 90%. Proximal and distal junctional kyphosis of ≥ 10 degrees occurred in 5 (25%) and 4 patients (20%), respectively. The median SRS 30 score was 84 points (range 78-91). Two patients underwent revision surgery for broken rod and skin irritation because of the implant. No wound infection and neurologic complications were observed

Conclusion:

The use of all-pedicle screws technique allows us to have a rigid anchor for posterior correction of the deformity without the need for anterior release. An acceptable correction was achieved and preserved by a safe surgical technique. This technique is a useful modality for treatment of Scheuermann's Kyphosis

EP-96 CAN WE PREVENT FURTHER NEUROLOGIC IMPAIRMENT AT INSTABLE TORACOLUMBAR TRAUMA? A CASE REPORT

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Introduction:

Our aim is to present a polytrauma patient with instable T11 fracture and discuss a method of preventing further neurologic deterioration during surgery.

Case report:

A severe pelvic injury, complex T11 fracture and clavicle fracture were detected at a 59-year-old female patient who suffered car accident. She had incomplete neurologic deficit. Posterior ligamentous complex injury, spinal cord edema and hematoma were determined at the level of T11 vertebra in MRI. The type of fracture was flexion-distraction. Pelvic and clavicle fractures were fixed in supine position. Then patient was placed in prone position and neuromonitoring system was prepared. An incision was made between T8-L2 vertebrae. Rupture of interspinous ligament and fractures of both laminae were detected at T11 level. This instability would cause further neurologic injury during pedicle screw application. Two diagonal K-wires, passing through T11 spinous process to the T12 facet joints were placed. After application of screws and rods the wires were removed and laminectomies were performed. A left sacroiliac screw was applied for fixation of sacrum fracture and sacroiliac separation finally.

Conclusion:

The possibility of spinal cord injury during fixation of instable fractures, e.g. flexion-distraction injury, is high. Diminished soft tissue support during dissection increases the risk. A temporary fixation up to instrumentation would decrease the risk. Insertion of diagonal K-wires through pedicles which are locking facet joints, is a simple and effective method that can be used for temporary fixation.

EP-97 VERTEBRAL FRACTURE AFTER SPINAL RADIATION THERAPY FOR MEDULLOBLASTOMA

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Introduction:

Adult medulloblastoma represents <1% of adult intracranial tumors. Irradiation of the whole craniospinal axis (CSA) is necessary for disease control, but the optimum dose of radiation is still disputed. In this case we present a patient who had T6 vertebral body fracture 2 years after cranio-spinal radiation therapy.

Case report:

A 28-year-old male with the diagnosis of cerebellar medulloblastoma was operated 2 years ago. After surgery, patient was staged with a neuroradiologic examination of the brain and neuroaxis and by cerebrospinal fluid cytology. He received three cycles of upfront cisplatin (cisplatin) and etoposide (VP16). Chemotherapy followed by cranio-spinal radiation therapy. 2 years later he referred to our institution with back pain. Thoracic spine CT demonstrated fracture of T6 vertebral body. He operated by posterior reduction and stabilization. Postoperatively, he had no any apparent sensory or motor weakness. Histopathological examination (HPE) revealed features of non-pathologic bone tissue.

Conclusion:

After successful treatment using craniospinal irradiation, significant late effects observed in long-term survivors led to trials hoping to reduce or eliminate radiation therapy. Chemotherapy has been successfully used to reduce radiation dose and volume for most patients. In selected low-risk patients, radiation therapy has been altogether eliminated.

EP-98 CAUDA EQUINE SYNDROME DUE TO LATE BONE GRAFT MIGRATION INTO THE SPINAL CANAL FOLLOWING TRANSFORAMINAL LUMBAR INTERBODYFUSION (TLIF): CASE REPORT

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Introduction:

Only a few cases of material (Fat graft, device) migration causing cauda equine syndrome, recurrent sciatica, and root compression following lumbar spine surgery have been reported. We report a case of bone graft migration causing symptomatic lumbar cord compression.

Case report:

A 59-year-old male presented with progressive low back pain and radiculopathy. He had severe spinal stenosis, degenerative disc diseases at L3-4, L4-5 and L5-S1 levels and lumbar scoliosis. He underwent an uneventful T10-S1 posterior instrumentation with unilateral laminectomies and TLIF to L1-2, L2-3, L3-4, L4-5, L5-S1 levels. Eight weeks later he presented to our clinic with acute, severe right-sided lumbar radicular pain and cauda equina syndrome. MRI demonstrated a mass at L5-S1 disc space impinging on the anterior thecal sac. Re-exploration revealed loosening of bilateral S1 screws. The interbody bone graft had gained a muddy consistency and appearance and was compressing the dural sac. The S1 screws were revised and iliac screws were added to the fixation. The impinging graft tissue was removed for decompression. Postoperatively the patient noticed significant improvement in stiffness and pain in both lower limbs, however, the urinary incontinence has not improved.

Conclusion:

Graft migration can occur even at a late stage following TLIF surgery. The pumping effect at the level of a loosened screw may cause this phenomenon. This complication should be kept in mind in patients developing new symptoms after surgery.

EP-99 POSTPARTUM SACRAL STRESS FRACTURE. A REPORT OF 3 CASES

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¹ MEDİTRONİK ÜNİVERSİTESİ

Introduction:

More than half of pregnant women complain of back pain at any stage of pregnancy. Sacral stress fractures are one of the rare but important causes of back pain in the post-partum period. Symptoms in most cases of pregnancy and childbirth process are regarded as an insignificant finding. Therefore, the true incidence of sacral stress fractures is not fully understood. However, sacral stress fractures must be considered in the differential diagnosis of the back pain in pregnancy or post-partum period.

Case report:

We report the three cases of a woman without osteoporosis and trauma who had a stress fracture of the sacrum. All patients were in the third decade. 2 of 3 patients' fractures were diagnosed ten days after her delivery. The other patient admitted 3 months after delivery. All standard laboratory tests and bone mineral density were normal. Direct radiographs of the pelvis showed no pathology. But computed tomography and magnetic resonance imaging demonstrated a fracture of the sacral wings.

Conclusion:

We report 3 cases of post partum sacral stress fractures with low back and/or buttock pain, whose symptoms were completely relieved following conservative methods. Sacral stress fractures should be considered in the differential diagnosis of post partum low back and/or buttock pain. To date, only a limited number of patients postpartum sacral stress fractures have been reported in the literature. Physical examination and proper radiologic evaluation are important for diagnosis. MRI is one of the most important imaging techniques for diagnosis.

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Introduction:

Primary spinal cord tumors constitute 2% to 4% of all central nervous system neoplasms. Intramedullary spinal cord astrocytomas are uncommon tumors. Intramedullary tumors affecting the entire cord from the cervicomedullary junction to the conus are termed "holocord tumors". A rare case of Intramedullary holocord astrocytoma extending from the medulla oblongata to the conus medullaris is reported

Case report:

In this article, we present two cases of holocord astrocytoma. First patient was 49-years-old male and presented with back pain and urinary incontinence. The second patient was 19-years-old female and presented with back pain and constipation. On MRI examinations longitudinally extensive intramedullary lesions were detected. The two patients were treated with subtotal resection and multiple laminectomies. Histopathological examination of all specimens resulted in diagnosis of a pilocytic astrocytoma

Conclusion:

Intramedullary spinal cord astrocytomas are uncommon tumors. For holocord tumors, there is no correlation of extent of resection and recurrence.

EP-101 CERVICAL SPINAL BRUCELLOSIS WITH ANTERIOR EPIDURAL ABSCESS: A CASE REPORT

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Introduction:

Spinal epidural abscess is rare but serious medical condition which may cause permanent neurological deficits, or even death, if not treated. Staphylococcus aureus is the responsible microorganism in most spinal abscess cases. However, rarely other microorganisms like Brucella may be responsible. Brucellosis is still an important health problem in the eastern part of Turkey, with approximately 9000 cases reported to the Ministry of Health database yearly. Although brucellosis may affect the spine, it is rarely may be complicated by epidural abscess or paraspinal purulent mass. Brucellar epidural abscesses causing spinal cord compression at the cervical level are extremely rare. We report the case of a patient with cervical spondylodiscitis at level C5-C6 and an epidural abscess which was compressing the spinal cord and the retropharyngeal space.

Case report:

Sixty-year-old male patient admitted to the clinic with the complaint of fever which had begun 12 days ago. After hospitalization in the Infectious diseases clinic, his brucella tube agglutination test resulted as 1:160, by the test result he was diagnosed with brucella infection and doxycycline and rifampicin treatment were begun. An emergency spinal MRI was performed due to worsening weakness in bilateral legs and arms, which occurred in the last 7 days. In his neurological examination, tetraparesis (60%) was present. In his spinal MRI, spondylodiscitis at the level C5-C6 and anterior epidural abscess were present. He was operated urgently. After C5-C6 corpectomy with anterior approach, posterior longitudinal ligament was excised. Stabilization through cage and plate/screw system was done following draining the purulent mass which was compressing the cord in the epidural space, accompanied by granulation tissue adhered to the ligament. The patient whose weakness in the extremities resolved in the post-operative period was handed over to the Infectious diseases clinic.

Conclusion:

Cervical brucellar epidural abscess is associated with a high incidence of devastating neurological complications and a poor overall prognosis. Therefore, it is essential to detect and treat it as early as possible.

EP-102 SEIZURE INDUCED LOMBER VERTEBRA FRACTURE

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Introduction:

Muscular contractions generated during a seizure can lead to a variety of musculoskeletal injuries as fractures and dislocations of the shoulder, femur, and acetabulum. A seizure-induced fracture of the spine is a rare clinical entity. Only few cases were reported in the literature. Although rare, it is extremely crucial to recognize this emergent fracture because it predisposes the patient to irreversible neurological injury.

Case report:

A 28 years old female checked into the outpatient clinic of our department with a low back pain after an acute episode of a generalized tonic clonic seizure during sleep. There was no traumatic fall from a bed during the seizure. In the immediate postictal period, the patient developed severe lower back pain without weakness of lower extremities. After 1 week because the low back pain did not disappear the patient attempt to our outpatient clinic. The neurological exam was normal. The X-ray of lumbar vertebra revealed a compression fracture in L1. The compression rate was %40. CT and MRI of lumbar spine was also taken. The medullary canal was open. The osteodensitometry was normal. We preferred surgical treatment and achieved posterior instrumentation and fusion. Over the course of the next 2 years, the patient had several tonic-clonic seizures but no lumbar or thoracic spine problem accompanied with them.

Conclusion:

This case report emphasizes the importance of critical musculoskeletal examination of patients admitted after tonic-clonic seizures even if an event of fall or trauma is not reported in the history.

EP-103 RARE S-4 FRACTURE WITH INTERESTING INJURY MECHANISM

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Introduction:

Sacral fractures due to direct trauma are very rare. They usually occur as a result of a high energy trauma and, are accompanied with pelvic fractures 40-50%.

Case report:

20 year old male patient was admitted to E.R. with sacral pain. Direct trauma to sacrum has occurred during a snow sled accident. Patient had lost his balance and while sliding, a rock on the ground bumped into his sacral region. At his physical examination there was a superficial laceration, ecchymosis and mild edema at the sacral region. Palpation to bony structures were painful. Neurovascular examination and other systemic examination was normal. On plain radiographs, a transverse fracture line at S4 level was observed. The diagnosis was confirmed with computed CT scan

Conclusion:

Sacral fractures generally occur due to indirect mechanisms with high energy traumas. At our case, it occurred due to a direct trauma to the intergluteal sulcus. We assessed that it was a high energy trauma to a localized region; high enough to cause a sacral fracture but not other systemic traumas. At suspected cases, computed tomography scans should be used to reach the diagnosis

DILEK ARSLAN, ONUR YAMAN,

IZMIR TEPECEIK TRAINING AND RESEARCH HOSPITAL

Introduction:

Ewing's sarcoma is a malignant round cell neoplasm of bone. Spinal column involvement is infrequent; comprising 10% of bone lesions of primary Ewing's sarcoma. Sacral involvement is even rarer.

Case report:

A female aged 42 years felt pain in her left buttock and lower extremity without any particular cause. Magnetic resonance imaging (MRI) revealed a mass lesion in the S1-S2 vertebral level. Her past and family histories were unremarkable. She had no apparent sensory changes and no muscle weakness in the lower extremities. The patellar and Achilles tendon reflexes were symmetrical and brisk. The Babinski sign was absent bilaterally. The straight leg test elicited pain at 45 degrees on the left side, but no additional pain occurred on the femoral nerve stretch test. She did not have any difficulty in defecation or urination. The white blood cell and C-reactive protein were all in normal levels. CA-125 was high; 37.9 U/ml. T1-weighted axial MRI detected a well-demarcated extramedullary lesion within the level S1-S2. It caused severe compression of the spinal cord from the anterior. The signal intensity of the lesion was almost the same as that of muscle. T2-weighted sagittal MRI also revealed intramedullary high intensity lesion with sizes of 3 cm x 2 cm in the sacrum. The patient underwent an operation by total S1-S2 laminectomy. A dark red tumor which was bled easily upon contact was totally removed. She had no muscle weakness or pain after the operation. Histopathological examination revealed features of malignant round cell tumor consistent with Ewing's sarcoma. Patient was then referred to an oncological center for further management.

Conclusion:

Malignant primary osseous spinal neoplasms are aggressive tumors that remain associated with poor outcomes despite aggressive multidisciplinary treatment measures. Differential diagnosis for a sacral lesion includes tuberculosis, pyogenic osteomyelitis, lymphoma, chordoma, osteosarcoma and Ewing's sarcoma. In conclusion, in presence of a sacral mass lesion, the above-mentioned differential diagnosis should be considered. MRI is sensitive in detecting these lesions but is nonspecific requiring histopathological examination for confirmation.

EP-105 HEMIVERTEBRA EXCISION TO MANAGE UPPER THORACIC SCOLIOSIS

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Introduction:

Congenital upper thoracic scoliosis is an unusual but potentially severe disfiguring cause of spinal deformity. The potential risks are very serious. Surgical options are very limited. Excision of hemivertebrae located upper thoracic region is controversial as the risk of neurological damage increases. Purpose of the study was to evaluate the effectiveness and safety of the posterior hemivertebra excision in the management of congenital upper thoracic scoliosis.

Case report:

One patient with congenital upper thoracic scoliosis underwent posterior hemivertebra excision and arthrodesis. The patient was followed clinically and radiographically. The preoperative age at the time of surgery was 14 years. Preoperative Cobb angle measurement 48°. The hemivertebrae was located at T4. There wasn't multiple associated vertebral anomalies or spinal dysraphism. He was evaluated preoperatively with magnetic resonance imaging and three-dimensional computerized tomographic scanning of the spine. Immediate postoperative Cobb angle corrected to 7° (86%). There were no neurologic or other significant complications.

Conclusion:

The natural history of congenital scoliosis affecting the upper thoracic spine. It is estimated that without operative management the scoliosis could have progressed to 45° or more over the follow-up period. Although only a single presentation of patients in this study, posterior hemivertebra resection at the upper thoracic spine appears to be safe and effective. Hemivertebra excision addresses the deformity directly, provides correction and balancing, and halts or reduces progression of scoliosis.

EP-106 SYRINGOMYELILI ADELOSAN SKOLYOZ HASTASINDA DEFORMITE DUZELTICI CERRAHI SONRASI GELISEN JENERALIZE EPILEPSI

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Introduction:

Adolesan idliopatik skolyoz ve epilepsi nadiren bir arada gorulen patolojilerdir. Burada opere ettigimiz idliopatik skolyozlu hastada ameliyat sonrası ortaya çıkan epilepsiyi ve bu tür olgularda nelere dikkat etmemiz gerektiğini vurgulamayı amaçladık.

Case report:

14 yaşındaki idliopatik skolyozlu kız çocuğunda eşlik eden siringomyeli ve spondilolistezis mevcut olup, olguya posterior deformite korreksiyonu ve fizyoterapi uygulandı. Hastada postoperatif 10. günde jeneralize epileptik nöbetler görüldü.

Conclusion:

Epilepsi peroperatif kanamanın fazla olduğu major spinal cerrahiler sonrası görülebilecek nadir bir komplikasyondur. Hemorajiyi sınırlı tutmak, hemostabilizasyona özen göstermek bu tür komplikasyonlara karşı önemli olacaktır.

EP-107 CONCURRENT CHIARI DECOMPRESSION AND SCOLIOSIS CORRECTION: IS IT SAFE AND NECESSARY?

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Introduction:

We have demonstrated that administration of neuromonitorization guided concomitant suboccipital decompression and deformity correction in the same session in a patient with wide syringomyelia and Chiari malformation with scoliotic/kyphotic deformity was a safe and effective method.

Case report:

The case was a 17 year-old male. MRI evaluations revealed Chiari I malformation and a large cervico-thoracic syringomyelia. Radiological evaluations demonstrated concomitant thoracic scoliosis and kyphotic deformities. Preop proximal thoracic AP Cobb angles and main thoracic angle were 40 and 42°, respectively. Lateral Cobb angle was 62° in the thoracic region. A preop neurological examination revealed numbness of the left arm and a slight loss of motor function. Neuromonitorization guided suboccipital decompression and concomitant laminectomy procedures were followed by T1 and L1 instrumentation and deformity correction with fusion in the same session. Total operation time was eight hours (1.5 + 6.5 h). A blood loss of 1500 cc occurred during the operation. Neuromonitorization revealed a clear improvement in the left arm following suboccipital decompression. Postoperative AP Cobb angle and proximal thoracic angle were 10° (75%), main thoracic angle was 5° (88%), and lateral Cobb angle was 45° (27.5%). The patient was mobilized on day 2, and discharged on day 7. No neurological deficits were observed during 12 month follow-up, and MRI controls revealed significant decreases in volume and diameter of the syringomyelia.

Conclusion:

Chiari malformation and syringomyelia are the most common intraspinal anomalies accompanying scoliosis. The approach in the treatment of spinal deformities like scoliosis and kyphosis accompanying spinal pathologies includes a second surgical correction of spinal deformities after 3 to 6 months following surgical treatment of the spinal pathology. Neuromonitorization reduces the risks related with deformity correction. In our case we demonstrated that concomitant Chiari decompression and spinal curve correction can be conducted safely and effectively in treatment of neuromuscular deformity in the same surgical session with neuromonitorization guidance.

EP-108 DEVELOPMENT OF LUMBAR DISC HERNIATION FOLLOWING PERCUTANEOUS VERTEBROPLASTY

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Introduction:

Intradiscal cement leakages are frequently seen during vertebroplasty operations. They are generally asymptomatic. To the best of authors' knowledge, this is the first case describing development of lumbar disc herniation after percutaneous vertebroplasty complicated with intradiscal cement leakage.

Case report:

A 74-year-old woman with the two weeks history of percutaneous vertebroplasty of L4 vertebrae was admitted to our emergency unit. She was suffering from an excruciating low back pain radiating to her right leg. Neurological examination and lumbar MRI revealed right L5 radiculopathy due to a sequestered disc fragment. She underwent microlumbar discectomy. Free disc fragment on the L5 root was removed. She was pain free and her neurological deficit immediately improved after surgery.

Conclusion:

Although extremely rare, intradiscal cement leakage during percutaneous vertebroplasty may promote development of lumbar disc herniation

EP-109 TREATMENT OF THE SCOLIOSIS IN CRISPONI SYNDROME: FIRST REPORTED CASE AND SURGICAL TREATMENT

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¹MEHMET AYDOGAN ¹

Introduction:

Crisponi syndrome is a rare autosomal recessive disorder characterized by bilateral camptodactyly congenital muscular contractions of facial muscles, major feeding and respiratory difficulties, and access of hyperthermia leading to death in the first months of life. Surviving patients usually develop a severe progressive kyphoscoliosis. The most prominent candidate gene was CRLF1. In the English speaking literature, cases described families from Sardinia and Turkey.

Case report:

Our case was 8 year-old-girl who had five operations for scoliosis before she admitted to our clinic. During her examination she had severe scoliosis, camptodactyly, large face, broad nose. Her genotype analysis was done and CRLF1 was (+). she had 5 operations before she admitted to our clinic. Her preoperative Cobb angle was 65 degrees. A two stage operation was planned for the treatment. In the first stage, her devices were removed and intravenous antibiotics were given for 1 day. at 15th day after the operation a T1-L3 posterior instrumentation was performed and correction was achieved at L1 level with Smith Peterson osteotomy. Her final Cobb angle was 5 degrees.

Conclusion:

our patient that we operated is only the Crisponi syndrome patient with thoracolumbar scoliosis who underwent posterior instrumentation and correction of scoliosis in the literature.

EP-110 INTRADURAL DISC HERNIATION MIMICKING A SPINAL TUMOR

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Introduction:

Intradural disc herniation is a rare complication of disc disease and comprises 0.26-0.30% of all herniated discs. It was first described in 1942 by Dandy and more than 150 cases have been reported since then. In all, 92% of intradural disc herniation were found in the lumbar region and only 10% of them occur at the L5-S1 level.

Case report:

A 43-year-old man was admitted with a 5 year history of low-back and right leg pain. Magnetic resonance Imaging revealed Iso-Intense mass-like lesion on non-contrast MRI, measuring 3.5x1.5x1.5 cm at the level of L5-S1. On contrast enhanced MRI, there was peripheral enhancement which is typical for a herniated disc. A right L5 hemilaminectomy was performed and no significant extradural lesion was identified. Dura mater was swollen and adhesion between the dura and posterior longitudinal ligament was seen. Following longitudinal durotomy, a ruptured disc fragment was identified and removed.

Conclusion:

Although physiologic and pathologic features of Intradural disc herniation are not clear. Several predisposing factors have been identified: a) adhesion between the posterior longitudinal ligament and dura mater; b) congenital narrowing of spinal canal with less epidural space; c) congenital or iatrogenic thinness of dura mater. At surgery, swelling of dural sac and root, adhesion between posterior longitudinal ligament and dura mater, absence of herniated disc fragment should consider Intradural disc herniation to neurosurgeon. In conclusion, potential presence of an Intradural disc herniation should be kept in mind when posterior longitudinal ligament is discontinuous and there is peripheral ring enhancement of an Intradural lesion demonstrated by MRI.

EP-111 GIANT INTRA-EXTRADURAL SCHWANNOMA OF THE CERVICAL SPINE

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IZMIR TEPECIK TRAINING AND RESEARCH HOSPITAL

Introduction:

Extracranial schwannomas in the head and neck region are rare neoplasm. Giant spinal schwannomas are defined as those that extend over more than two vertebral levels. Giant cervical schwannomas are rare tumors that are difficult to diagnose preoperatively. Long-term surveillance is not recommended and surgical excision should be considered for this tumor, even though the tumor is considered benign and recurrence is rare.

Case report:

A 39-year-old woman presented with a one year history of motor weakness of bilateral upper extremity, clumsiness of bilateral hands, and mild gait disturbance. Preoperative magnetic resonance imaging showed left paravertebral giant tumor encroaching on the cord at C1-C2 which was measured 42*25*33 mm. T1-weighted imaging showed the tumor hypointensity. T2-weighted imaging demonstrated a higher intensity and inhomogeneous contrast enhancement. The tumor was excised using a posterior midline approach. C1 lamina was destructive. In the left side extradural part of the multinodular tumor were completely enucleated and a small amount of intradural parts of multinodular tumor were completely extirpated. The tumor was attached to the left posterior rootlets that had to be sacrificed. Gross examination of the tumor showed yellowish-white soft contents that were encapsulated and multilobulated. Histologic examination revealed schwannoma. The patient made good progress post-operatively with an early significant improvement in her initial presenting symptoms. She was discharged home six days post-operatively.

Conclusion:

To the best of our knowledge, this is the second reported case of Intra-extradural cervical schwannoma. Sakaura et al reported the first case. It was Intra-extradural plexiform schwannoma of the cervical spine. But this case is the first giant Intra-extradural schwannoma of the cervical spine.

EP-112 MYELOMALASIA OF CERVICAL SPINAL CORD DUE TO HYPEREXTANTION TRAUMA ON DEGENERATIVE CERVICAL SPINAL STENOSIS

, HAKAN CIFT, ALI SEKER, ISMAIL OLTULU, MEHMET AYDOGAN, ME

____ CEM SEVER

MEDIPOL UNIVERSITY

Introduction:

report a case of myelomalasia of cervical spinal cord due to hyperextension trauma on a degenerative cervical spinal stenosis which treated in double stage.

Case report:

A 70-year-old man who fell from a tree, complained of neck pain and unable to walking and using right upper extremity. During the last 1 year, progressive limitation of active motion of neck and increasing had developed. On physical examination, hemiplegia of right upper extremity, hemiparesis of both lower extremities, severe neck pain was noted. Plain radiographic evaluation suggested the presence of C5-C6 and degenerative changes in cervical spine. Computed tomography (CT) of the cervical spine revealed osteophytes posterior side of the C5 and C6 corposes and facet arthrosis.

Magnetic resonance imaging (MRI) of the cervical spine was undertaken to reveal spinal cord injuries associated with trauma. Sacral myelomalacia at the level of C3 and C4 and severe spinal stenosis at the level of C5 and C6 was noted. Posterior instrumentation, fusion and laminectomy with posterior approach and C5 corpectomy, C3-C4 and C6-C7 discectomy and plate fixation with anterior approach was performed in double stage. Postoperatively, primary stabilization of the vertebrae, decompression of the spinal cord and an anatomical both frontal and sagittal balance was achieved. The patient was able to walk without help within two days of operation and completely recovered and returned to previous daily activity in 6 months after surgery.

Conclusion:

Myelomalacia of the spinal cord can easily be misdiagnosed and may be the main problem after hyperextension trauma on a degenerative spine. Early decompression of spinal cord and stabilization of vertebral column is essential in these cases.

EP-113 PENETRATING SPINAL CORD INJURY WITH REBAR: CASE REPORT

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Introduction:

Penetrating spinal cord injuries, often occurred with stab during assault are rare, and occurs frequently in socio-economically backward countries. Penetrating spinal cord injuries mostly seen in cervical and thoracic region. Penetrating injuries of the conus, lumbar spinal roots and lumbar plexus are extremely rare.

Case report:

25-year-old male patient who fell from height, presented with a 18 mm diameter rebar in the lumbar region. Physical examination revealed that the rebar perforated the skin at L5 level and extended to cranial. Neurological examination revealed that the right and left hip flexion and extension was 3/5. Fracture of left L2 lamina and penetration into the spinal cord at L2-3 level were seen on the CT scans. L2 total laminectomy and bilateral facetectomy with L2-3 pedicle screw fixation were performed and rebar was pulled out. Neurological deficit of the patient was improved.

Conclusion:

The most common presentations of penetrating spinal cord injury are local pain, loss of strength and varying degrees of sensory loss, sphincter disorders, cerebral spinal fluid (CSF) leak, meningitis, and abscess. Although surgical treatment is controversial, the presence of foreign bodies, epidural or intradural abscess, granuloma, prolonged CSF leakage, compresses to the spinal cord, progressive neurological deficits are the surgical indications.

EP-114 FLOATING ROD IN ABDOMEN: AN INTERESTING CASE REPORT

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Introduction:

Spinal instrumentation is a well-known and commonly used method for degenerative spinal deformations. There have been many documented broken and migrated rod and screws in the literature and daily practice. Rotation and migration of rods within spinal canal is a well-known long term complication. However; migration of a rod to a distant site other than spinal canal is a rare entity and has been rarely presented.

Case report:

Sixty-seven year old female patient applied our outpatient clinic with right leg pain. She had been operated for degenerative lumbar spondylolisthesis in another hospital in 2006. After the operation, her right leg pain disappeared. But 3 months later, the pain recurred. She applied physical therapy; it made her feel better but in upcoming years, her pain became worse again. On her neurological examination, she was intact except neurological claudication over 50 meters distance. Her laboratory test results were normal. On lumbar AP/lateral radiographs, a small, thin hyperdense mass was detected. After careful examination, it was diagnosed as a rod piece migrated to near kidney.

Conclusion:

To our knowledge this is the first case report of spinal instrumentation rod migrated to abdomen without presenting abdominal signs and symptoms. It is also the first case report about rod in abdomen documented with radiographs, computed tomography and MRI. Careful surgical technique and follow-up of instrumented patients are warranted for long-term complications of the procedure.

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Thanks For Contributions...