



# XV. Uluslararası Türk Omurga Kongresi “Omurgada Deformite”

24-27  
MAYIS  
2023  
*İzmir*

Wyndham Grand İzmir





# XV. Uluslararası Türk Omurga Kongresi

## “Omurgada Deformite”



### KONGRE DÜZENLEME KURULU

#### KONGRE EŞ BAŞKANLARI

Dr. Erdal COŞKUN

Dr. Esat KITER

#### KONGRE SEKRETERLERİ

Dr. Ferhat HARMAN

Dr. Ömer ERŞEN

#### KONGRE DÜZENLEME KURULU

Dr. Ömer AKÇALI

Dr. Turgut AKGÜL

Dr. Özkan ATEŞ

Dr. Mustafa ÇELİKTAŞ

Dr. Sedat DALBAYRAK

Dr. Ali DALGIÇ

Dr. Alihan DERİNCEK

Dr. Yurdal GEZERCAN

Dr. Serdar KAHRAMAN

Dr. Deniz KARGIN

Dr. Fatih KESKİN

Dr. Abdullah MERTER

Dr. Metin ÖZALAY

Dr. Erkin SÖNMEZ

Dr. Alparslan ŞENKÖYLÜ

Dr. Yetkin SÖYÜNCÜ

\* Soyad alfabetik olarak sıralanmıştır.



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**SALON 1**

## 10:30-18:05 SRS WWC MEETING

### 10:30-11:45 SESSION 1: Why is EOS a different animal? Moderators: *Ufuk Talu*

#### 10:30-10:40 Welcome

*Esat Kiter and Muharrem Yazici, Local Hosts*  
*Laurel Blakemore, SRS Vice President*

- 10:40-10:50 Age specific classification and risk stratification: Why and how?
- 10:50-11:00 Clinic evaluation: Spine is the tip of iceberg
- 11:00-11:10 Growth is the 4<sup>th</sup> dimension of spine!
- 11:10-11:20 MSK and spinal cord interactions: Effects and consequences
- 11:20-11:45 Discussion

*Charles Johnston*  
*Esat Kiter*  
*Haluk Berk*  
*Deniz Konya*

### 11:45-13:00 SESSION 2: Can we win without spilling blood? Moderator: *Alpaslan Şenköylü, MD.*

- 11:45-11:55 Bracing is a good alternative for EOS
- 11:55-12:05 What do we need for having a good cast for IEOS
- 12:05-12:15 Serial casting for non-idiopathic, syndromic scoliosis
- 12:15-12:25 Is there no complication if there is no blood or pain?
- Conservative treatment free is of complications?
- 12:25-12:35 How safe and reliable is multimodal neuromonitorization in young children?
- 12:35-13:00 Discussion

*Çağlar Yılgör*  
*Gökhan Demirkiran*  
*Charles Johnston*  
*Laurel Blakemore*

*Serdar Kahraman*

#### 13:00-14:00 Lunch Break

### 14:00-15:05 SESSION 3: Trying to straighten a crooked spine by stretching it Moderator: *Esat Kiter*

- 14:00-14:10 Does being old require being out of date? Traditional GR at the MCGR era
- 14:10-14:20 Is it time to dispose of the VEPTRs in stock? Is VEPTR still a good alternative for EOS in 2023?
- 14:20-14:30 MAGEC is still magic? What happened to the rabbit in the hat
- 14:30-14:40 Hidden cost of GFT: Do more harm than good
- 14:40-15:05 Discussion

*Ufuk Talu*  
*Laurel Blakemore*  
*Alpaslan Senkoylu*  
*Muharrem Yazici*



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## 15:05-16:15 SESSION 4: When the blind lead the blind: Can biological tissue be guided by a metallic implant?

**Moderator: Ahmet Alanay**

- 15:05-15:15 Is the spine the good boy who walks the path shown to him?  
15:15-15:25 Curve too rigid to be distracted, too large to be corrected by distraction  
15:25-15:35 VBT: Is it the holy grail of EOS?  
15:35-15:45 Are we helpless in the face of mechanical and biological complications?  
15:45-16:15 Discussion

Meriç Enercan  
Mehmet Balioğlu  
Ahmet Alanay  
Suken Shah

16:15-16:45 Coffee Break

## 16:45-17:55 SESSION 5: As if being very young wasn't already a problem.

**Moderator: Haluk Berk**

- 16:45-16:55 Neuromusculars with severe comorbidity  
16:55-17:05 Complex congenitals  
17:05-17:15 Bone dysplasias  
17:15-17:25 Deformity as part of or as a result of the syndrome  
17:25-17:35 Weak bone  
17:35-17:55 Discussion

Laurel Blakemore  
Azmi Hamzaoglu  
Ralf Stuecker  
Paul Sponseller  
Suken Shah

## 17:55-18:05 SESSION 6: Neither fish nor fowl: Adding a new word to dictionaries

- 17:55-18:05 Tweeners  
  
18:15-18:25 Açılış Konuşmaları  
18:25-18:45 Açılış Konuşmaları  
18:45-19:15 Türk Omurga derneğinin kuruluşu ve gelişimi

Sedat Dalbayrak  
Esat Kiter, Erdal Coşkun  
Emin Alıcı



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SALON 1

## 08:00-09:00 YILIN BİLDİRİLERİ

**Oturum Başkanları: Esat Kiter, Erdal Coşkun**

- S-001 Investigation of Pain Pathway Tractography After Spine Correction Surgery in Individuals with Idiopathic Scoliosis  
*Sabri Batın*
- S-002 Intraoperative Neurophysiological Monitoring Changes In Post-traumatic Spinal Fractures  
*Yusuf Altuntaş*
- S-003 Intradiscal Vacuum Phenomenon In Spinal Stenosis With Stabilisation: A Single-centre Retrospective Study  
*Bariş Albuz*
- S-004 Blood Transfusion In Adolescent Idiopathic Scoliosis Surgery: Is It Necessary?  
*Özcan Kaya*
- S-005 How to Best Restore the Pelvic Version during Adult Spinal Deformity Surgery  
*Cağlar Yilgor*
- S-006 Lumbar Spine Motion And Endurance After Vertebral Body Tethering And Selective Thoracal Fusion In Patients With Idiopathic Scoliosis  
*Esin Nur Taşdemir*
- S-007 Different C2 screw placement technique with mobilization of the vertebral artery in high-riding vertebral artery cases: Cadaver Dissection  
*Ferhat Harman*
- S-008 Functional outcomes and health related quality of life of patients underwent traumatic spino-pelvic dissociation treated with bilateral triangular osteosynthesis  
*Hakan Koray Tosyalı*
- S-009 A Comprehensive Analysis of Outcomes and Treatment Success of Thoracic, Thoracolumbar and Bilateral Vertebral Body Tethering Surgery  
*Ahmet Alanay*
- S-010 Molecular analysis of leptin receptor in bone tissue and some markers causing an increasing effect in bone tissue mass at lumbar spinal stenosis patients who need to have surgical treatment  
*Ozan Aydogdu*



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SALON 1

## 09:00-10:00 OMURGA DEFORMİTESİ ÜZERİNE

*Oturum Başkanları: Esat Kiter, Erdal Coşkun*

- 09:00-09:20 Hipokrattan bugüne deformite  
09:20-09:40 Deformite cerrahisinde nereden nereye geldik?  
09:40-10:00 Deformite cerrahisinde bu günden sonra.

Sait Naderi  
Ömer Akçalı  
Muharrem Yazıcı

10:00-10:20 Kahve Arası

## 10:20-12:00 PANEL 1: Erişkin Deformite

*Oturum Başkanları: Cüneyt Şar, Aydemir Kale*

- 10:20-10:35 Vertebral kolonda deformiteyi tanımlamak ve dengeyi değerlendirmek  
10:35-10:50 Erişkin deformite sınıflaması (SRS)  
10:50-11:05 Denovo skolyoz hakkında ne biliyoruz  
11:05-11:20 Erişkin deformite cerrahisinde risk faktörleri ve cerrahiye karar verme  
11:20-11:35 Cerrahide optimum planlama. Düzeltme mi dekompresyon mu?  
Sadece dekompresyon ne zaman?  
11:35-11:50 Erişkin deformitede pelvisi dahil etme çözüm mü, macera mı?  
11:50-12:00 Tartışma

Can Koşay  
Serdar Kahraman  
Mehmet Tezer  
Deniz Konya  
Kemal Koç

Necdet Altun

12:00-13:00 Öğle Yemeği

## 13:00-14:30 INSTRUCTIONAL COURSE LECTURES I

*Oturum Başkanları: Muharrem Yazıcı, Erkan Kaptanoğlu*

- 13:00-13:20 Redefining GFI indicators from the 2023 standpoint  
13:20-13:40 Management of syndromic scoliosis with ligamentous laxity  
13:40-14:10 The meaning and importance of SRS for the modern spinal deformity world:  
Contributions to date and future perspectives  
14:10-14:30 Discussion

Charles Johnston  
Paul Sponseller  
Laurel Blakemore

14:30-14:45 Ara



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Necdet Altun

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## 14:45-16:15 PANEL 4: Pediatrik Deformite I Oturum Başkanları: *Ufuk Aydın, Mürteza Çakır*

14:45-15:00	Pediatric hastalarda matüritenin değerlendirilmesi	Gökhan Demirkıran
15:00-15:15	Pediatric spondilolizis ve listezis	Süleyman Çaylı
15:15-15:30	Nöromuskuler skolyoz değerlendirme ve tanı	Yetkin Söyüncü
15:30-15:45	Nöromuskuler skolyozda cerrahi prensipler	Çağatay Öztürk
15:45-16:00	Nöromuskuler skolyoz risk faktörleri ve komplikasyon yönetimi	Numan Karaaslan
16:00-16:15	Tartışma	

16:15-16:30 Kahve Arası

## 16:30-18:00 INSTRUCTIONAL COURSE LECTURES II Moderators: *Emre Acaroğlu, Onur Ulu*

16:30-16:50	Management of cervical spine deformities in children	Ralf Stuecker
16:50-17:10	2023 perspective in AIS: What have we achieved since Paul Harrington, and what are we failing at?	Suken Shah
17:10-17:30	Deformity after traumatic or pathologic fractures	Cumhur Öner
17:30-17:50	Management of degenerative deformities; current concepts	Ioannis Magras
17:50-18:00	Discussion	



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SALON 2

## 10:20-12:00 PANEL 2: Gençler Olgular Üzerine Tartışıyor I/ En Öğretici Vakam Oturum Başkanları: Ömer Erşen, Mehmet Seçer

10:20-10:35	Olgu Sunumları
10:35-10:50	Olgu Sunumları
10:50-11:05	Olgu Sunumları
11:05-11:20	Olgu Sunumları
11:20-11:35	Olgu Sunumları
11:35-11:50	Olgu Sunumları
11:50-12:00	Tartışma

İlhan Yılmaz  
Aliyekber Yapar  
Ramazan Paşahan  
İsmail Daldal  
Barış Aslanoğlu  
Barış Polat

12:00-13:00 Öğle Yemeği

## 13:00-14:30 PANEL 3: Erişkin Deformite II / Spondilolistezis Oturum Başkanları: Tarık Yazar, Erkin Sönmez

13:00-13:15	Spondilolistezis etiyoloji ve sınıflama
13:15-13:30	Erişkin deformite ve degeneratif spondilolistezis
13:30-13:45	Spondilolisteziste tedaviyi yönlendiren faktörler (yaş, tip ,bulgu)
13:45-14:00	Spondilolisteziste redüksiyon
14:00-14:15	Yüksek dereceli spondilolistesizde cerrahi tedavi prensipleri
14:15-14:30	Tartışma

Onat Üzümcügil  
Emrah Keskin  
Akif Albayrak  
Şükrü Çağlar  
Ahmet Öğrenci

14:30-14:45 Ara

## 14:45-16:15 PANEL5: Gençler Olgular Üzerine Tartışıyor II/ En Öğretici Vakam Moderatör: Kamil Eyvazov, Ferhat Harman

14:45-14:55	Olgu Sunumları
14:55-15:05	Olgu Sunumları
15:05-15:15	Olgu Sunumları
15:15-15:25	Olgu Sunumları
15:25-15:35	Olgu Sunumları
15:35-15:45	Olgu Sunumları
15:45-15:55	Olgu Sunumları
15:55-16:05	Olgu Sunumları
16:05-16:15	Tartışma

Tolga Akbıyık  
Recep Dinçer  
Murat Özcan Yay  
Bilge Kağan Yılmaz  
Arda Topçam  
Kadir Abul  
Uğur Yüzügüldü  
Sabri Güngör

16:15-16:30 Kahve Arası



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**16:30-18:00 PANEL 6: Komplikasyonlar**  
**Oturum Başkanları: Abtullah Milcan, Murat Hancı**

- 16:30-16:45 Major deformite cerrahisinde kanama yönetimi  
16:45-17:00 Deformite cerrahisinde IONP ve teknisyen, anestezi, cerrahin kriz yönetimi  
17:00-17:15 Dural yaralanma yönetimi  
17:15-17:30 Visseral komplikasyonlar  
17:30-17:45 Nörolojik komplikasyonların yönetimi  
17:45-18:00 Tartışma

Ahmet Gürhan Gürçay  
Mert Çiftçdemir

Kudret Türeyen  
Murat Songür  
İlker Kiraz



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SALON 3

## 13:00-14:30 WORKSHOP 1

VBT vetebral body tethering workshop



Mehmet Aydoğın

14:30-14:45 Ara

## 14:45-16:15 WORKSHOP 2: Schroth, Korse ve Kompleks Deformitede Konservatif Cerrahi Moderatör: Dr. Kayra Barut



- 14:45-15:00 Skolyoz Spesifik Fizyoterapötik Egzersizler  
15:00-15:10 Tartışma  
15:10-15:25 Definitif Tedavi Metodu Olarak Korse  
15:25-15:35 Tartışma  
15:35-15:55 Kompleks Deformitede Konservatif Cerrahi  
15:55-16:15 Tartışma

Deniz Aktan Ilgaz

Çağlar Yılğör

Ahmet Alanay

16:15-16:30 Kahve Arası

## 16:30-18:00 SERBEST BİLDİRİ OTURUMU: 1 Oturum Başkanları: Cenk Soydan, Yahya Turan

- S-011 Our Results Of Spinopelvic Fixation In Vertical Unstable Pelvic Fractures And Transverse Sacrum Fractures.  
Azad Yıldırım
- S-012 Changes In Sexual Activity In Female Patients Surgically Treated For Kyphosis Due To Ankylosing Spondylitis  
Muhammed Fatih Serttaş
- S-013 Should Pelvic Fixation Be Included In The Surgical Treatment Of Neuromuscular Scoliosis?  
Alim Can Baymurat
- S-014 Assessing Cervical Lordosis Correction In Anterior Cervical Disc Surgery: A Comparison Of Cage Plate And Cage-only Approaches  
Gökhan Akkaya
- S-015 Posterior Cervical Fixation Techniques In Craniocervical Junction And Upper Cervical Region Pathologies: Clinical Experience  
Luay Şerifoğlu



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SALON 3

- S-016 The Effect Of Posterior Spinal Fusion On Spinal Sagittal And Spinopelvic Parameters In Scheuermann Kyphosis With Different Curve Pattern  
*Muhammed Fatih Serttaş*
- S-017 Effect of distal fusion level on sagittal spinal and spinopelvic parameters in lenke 5 adolescent idiopathic scoliosis  
*Buğra Han Eryılmaz*
- S-018 Does implant related complications interfere with correction in the Shilla technique performed to treat early onset scoliosis?  
*Mehmet Bülent Balioğlu*
- S-019 Results of surgical treatment in upper cervical vertebra injury after trauma  
*Bekir Murat Doger*
- S-020 Evaluation To Early Term Sagittal Balance Paramethers In Patients With Degenerative Lomber Stenosis Surgery That Bilateral Decompression Via Unilateral Approach  
*Bilal Yekeler*
- S-021 Is medullar canal invasion as a predictor for posterior ligamentous complex injury in thoracolumbar burst fractures?  
*Yekta Furkan Altın*
- S-022 Comparison of the clinical and radiologic outcomes of patients with Lenke type 5 and 6 AIS treated surgically and with L3 and L4 as the lowest instrumented vertebrae  
*Alim Can Baymurat*
- S-023 Digitized Radiographs Outperform Radiographic Measurements in Predicting Mechanical Complications after Adult Spinal Deformity Surgery  
*Cağlar Yılğör*
- S-024 Evalution Of Percutane Posteior Facet Fusion Thecnique With Anterior Cervical Surgery Relationship  
*Halit Şensoy*
- S-025 Retrospective Evaluation of 15 Spinal Infection Cases who underwent surgical treatment in our clinic  
*Ömer Akar*



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SALON 1

## 08:30-10:15 PANEL 7: Pediatrik Deformite II / Adölesan İdiyatik Skolyoz Oturum Başkanları: Esat Kiter, Erol Öksüz

08:30-08:45	Etioloji ve patogeneze. Yeni ne var?
08:45-09:00	Sınıflama ve cerrahi planlama
09:00-09:15	Selektif füzyon ve selektif füzyon dekompanzasyonu
09:15-09:30	Pediatrik omurgada hibrid enstrümantasyon
09:30-09:45	Post operatif omuz dengesizliği?
09:45-10:00	Enstrümantasyon üzerinden deformite düzeltme manevraları
10:00-10:15	Tartışma

Şakir Ekşi  
Ömer Akçalı  
Ufuk Talu  
Azmi Hamzaoglu  
Murat Bezer  
Alpaslan Şenköylü

10:15-10:30 Kahve Arası

## 10:30-12:00 PANEL 9: Pediatrik Deformite III / İdiyatik Skolyoz Oturum Başkanları: Ali Şehirlioğlu, Erhan Çelikoğlu

10:30-10:45	AIS de egzersiz programı
10:45-11:00	Brace tedavisinde temel prensipler
11:00-11:15	Jüvenil idiyatik skolyozda büyüme koruyucu tedavi prensipleri
11:15-11:30	VBT endikasyon ve teknik
11:30-11:45	VBT komplikasyonlar ve revizyon
11:45-12:00	Tartışma

Aliye Kapukıran Tosun  
Serkan Erkan  
Metin Özalay  
Mehmet Aydoğan  
Çağlar Yılğör

12:00-13:00 Öğle Yemeği

## 13:00-14:15 INSTRUCTIONAL COURSE LECTURES III Moderators: Ahmet Alanay, Hakan Emmez

13:00-13:20	Is it required fusion in the lumbar spinal stenosis with spondylolisthesis after decompression ?
13:20-13:40	Technical notes on TL osteotomies
13:40-14:00	Controversies in sagittal plane alignment: Prediction&Planning
14:00-14:15	Discussion

Ioannis Magras  
Cumhur Öner  
Ahmet Alanay

14:15-14:30 Ara



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SALON 1

**14:30-16:00 PANEL 11: Genç Spinal Cerrahlara Tavsiyeler, Tecrübe Konuşuyor**  
**Oturum Başkanları: Mehmet Akif Kaygusuz, Erdal Coşkun**

- 14:30-14:50 Omurga cerrahisinde öğrendiklerim
- 14:50-15:10 Omurga cerrahisinde hatalardan kaçınma
- 15:10-15:30 Omurga cerrahisinde merkezler ve kariyer planlama
- 15:30-15:50 Omurga cerrahisinde araştırma ve makale planlama
- 15:50-16:00 Tartışma

Sedat Dalbayrak  
Mehmet Zileli  
Emre Acaroğlu  
Haluk Berk

16:00-16:30 Kahve Arası

**16:30-18:00 PANEL 13: Deformitede Osteotomiler**  
**Oturum Başkanları: Erol Yalnız, Sedat Çağlı**

- 16:30-16:45 Osteotomi sınıflamaları ve endikasyonları
- 16:45-17:00 Osteotomi planlaması: Hangi olguya hangi osteotomi ve nereye?
- 17:00-17:15 Posterior kolon osteotomileri (Ponte & SPO) & Örneklerle uygulama
- 17:15-17:30 PSO: Endikasyon ve cerrahi trikler
- 17:30-17:45 VCR: Ne zaman gerekir? Nasıl yaparım?
- 17:45-18:00 Osteotomi komplikasyonları
- 18:00-18:15 Tartışma

Mutlu Çobanoğlu  
Burak Akesen  
Orkun Koban  
Suat Canbay  
Meriç Enercan  
Kıvanç Olguner

**18:15-19:15 GENEL KURUL**



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SALON 2

## 08:30-10:15 PANEL 8: Deformite cerrahisinde yeni ufuklar Oturum Başkanları: Çağlar Temiz, Mehmet Çetinkaya

08:30-08:45	Deformite cerrahisinde endoskopinin yeri	Hayati Aygün
08:45-09:00	MISDEF algoritması	Mehdi Sasani
09:00-09:15	Deformite cerrahisi ve yapay zeka	Deniz Kargın
09:15-09:30	Deformite cerrahisinde Navigasyon, VR ve robotik cerrahi	Özkan Ateş
09:30-09:45	Deformite cerrahisinde dinamik stabilizasyon	Tunç Öktenoğlu
09:45-10:00	Tartışma	

10:15-10:30 Kahve Arası

## 10:30-12:00 PANEL 10: Endoskopi Oturumu Oturum Başkanları: Hayati Aygün, İlyas Dolaş

10:30-10:45	Servikal/torakal diskektomi	Ali Dalgıç
10:45-11:00	Lumbar transforaminal diskektomi	Oğuz Karaeminoğulları
11:00-11:15	Lumbar interlaminar diskektomi	Alihan Derince
11:15-11:30	Lumbar dar kanal dekompresyon ve füzyon	Abdullah Merter
11:30-11:45	Endoskopinin sıra dışı vakalarda kullanımı	Özkan Çeliker
11:45-12:00	Endoskopik omurga cerrahisinin komplikasyonları	Hakan Sabuncuoğlu

12:00-13:00 Öğle Yemeği

## 13:00-14:15 SERBEST BİLDİRİ OTURUMU 2 Moderatör: Alim Can Baymurat, İdris Sertbaş

- |       |  |
|-------|--|
| S-026 | Effects of Vertebral Fractures and their Features on Intervertebral Disc Degeneration<br>Alaa Mukat  |
| S-027 | Long-term Opioid Medication Profile of European Adult Spinal Deformity Patients: Minimum Five Years Follow-up Study<br>Kadir Abul  |
| S-028 | Examination of The Relationship Between The Walter Reed Visual Assessment Scale, Rosenberg Self-Estimated Scale And Quality of Life In Adolescent Idiopathic Scoliosis<br>Kübra Albayrak |
| S-029 | The effect of Halo-Gravity Traction on large and rigid deformities of the spine<br>Mehmet Bülent Balioğlu  |



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SALON 2

- S-030 The effect of neuromuscular scoliosis surgery on pelvic obliquity  
*Mehmet Çetinkaya*
- S-031 Results of Fluoroscopy-Guided Medial Branch Block for the Treatment of Lower Lumbar Facet Joint Pain: A 2-year Follow-up  
*Abdulmutalip Karaaslanlı*
- S-032 A Comparative Analysis of Skeletal Maturity Staging Systems by Means of Longitudinal Growth and Curve Modulation Prediction after VBT Surgery  
*Altuğ Yücekul*
- S-033 Reliability analysis of smartphone use in kyphosis angle measurement  
*Behiç Çelik*
- S-034 Navigating the Spine with Augmented Reality: A Single Cadaver Study  
*Ali Ekrem Adıyaman*
- S-035 Assessment of the quality and reliability of youtube as an information source for transforaminal interbody fusion  
*Yusuf Bayram*
- S-036 investigation of the relationship between spine structure and mobility in the sagittal plane and physical activity and functional mobility in women with hyperkyphosis  
*Hilal Uzunlar*
- S-037 The Outcomes And Complication Rates Of The Adult Spinal Deformity Surgery Reported From A Single Dedicated Spine Center  
*Ercan Hassa*

14:15-14:30 Ara

## 14:30-16:00 PANEL 12: Konjenital Omurga Deformitesi I Oturma Başkanları: Mahir Gülşen, Hakan Karabağlı

- |             |   |                  |
|-------------|---|------------------|
| 14:30-14:45 | Sınıflama çalışıyor mu? Doğal seyir tahmin edilebilir mi?   | Mustafa Çeliktaş |
| 14:45-15:00 | Cerrahi tedavide zamanlama ve planlama  | Tolga Ege        |
| 15:00-15:15 | Spinal disrafizm anomalilerinde deformite yönetimi  | Tahsin Erman     |
| 15:15-15:30 | Minimal deformiteli asemptomatik hastada Arnold Chiari, syringomiyeli ve tethered kord'a yaklaşım | Onur Ulu         |
| 15:30-15:45 | Kifektomi endikasyonları ve cerrahi teknikler   | Nail Özdemir     |
| 15:45-16:00 | Tartışma  |                  |

16:00-16:15 Kahve Arası



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## 16:15-18:00 PANEL 14: Kongenital Omurga Deformitesi II Oturum Başkanları: Erhan Sesli, Aslan Güzel

- |             |   |                  |
|-------------|---|------------------|
| 16:15-16:30 | Oksipitoservikal bileşke deformiteleri                        | Serkan Şimşek    |
| 16:30-16:45 | Servikal konjenital deformiteler                              | Yurdal Gezercan  |
| 16:45-17:00 | Tortikollis   | Nusret Ök        |
| 17:00-17:15 | Lumbo sakral geçiş anomalileri (Sakralizasyon, Lumbalizasyon) | Şeref Doğan      |
| 17:15-17:30 | Sakral agenezi  | Bekir Yavuz Uçar |
| 17:30-17:45 | Kongenital deformitelerde uygun cerrahi teknik seçimi         | Nurullah Ermiş   |
| 17:45-18:00 | Tartışma  |                  |



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## 08:30-10:15 SERBEST BİLDİRİ OTURUMU: 3

**Oturum Başkanları: Recep Dinçer, Mete Karatay**

- S-038 Comparison Between Traditional Radiological Parameters and a Novel Angle Measurement Technique in Cervical Spinal Stenosis  
*Buse Sarıgül*
- S-039 Transforaminal injection treatment of lumbar disc herniation: Platelet-rich plasma versus steroid with platelet-rich plasma  
*Mehmet Fatih Aksay*
- S-040 Evaluation of the efficiency of the dual drain system in the treatment of CSF fistula developed after spinal stenosis surgery  
*Celal Ozbek Cakır*
- S-041 Implementing an infection control checklist may not be effective in reducing the incidence of surgical site infections in spinal surgery  
*Cihan Kırçıl*
- S-042 Balloon kyphoplasty in the treatment of multiple myeloma: The role of level selection on multiple segmental involvements of the spine  
*Hüseyin Sina Coşkun*
- S-043 The quality assessment of youtube™ videos about scoliosis  
*Erdi Imre*
- S-044 Are there any changes in the craniocervical junction after pediatric congenital scoliosis surgery?  
*Mehmet Bülent Balıoğlu*
- S-045 Effectiveness of Ultrasound-Guided Caudal Epidural Steroid Injection for Pain Relief in Recurrent Lumbar Disc Herniation  
*Ali Güler*
- S-046 The analysis of coronal and sagittal sections differences at postop period after vbt surgery on pediatric nonidiopathic scoliosis cases  
*Ercan Bal*
- S-047 Relationship Between Lumbar Disc Herniation And Spinopelvic Parameters  
*Zafer Soydan*
- S-048 The relationship of complications according to intraoperative imaging methods in the posterior instrumentation of the thoracolumbar spine with transpedicular screw  
*Demet Evleksiz Karimzada*
- S-049 Low-lying conus medullaris rates in patients with meningomyelocel operated in our clinic  
*Ümit Zeydoğlu*



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- S-050 Comparison of Radiographic and Clinical Outcomes of Adult vs Adolescent Scheuermann Kyphosis Patients: A Matched Cohort Analysis after Surgery  
*Ahmet Alanay*
- S-051 Demographic Analysis of Cervical Spine Pedicles in Turkish Population  
*İbrahim Sungur*
- S-052 The association between radiographic lumbar spinal stenosis and the quality of life in the turkish population  
*Ömer Neşet KİŞİ*
- S-053 “T-Tool” for Intraoperative Evaluation of Coronal Balance in Spinal Deformity Surgery  
*Ahmet Öğrenci*

## 10:20-12:00 SERBEST BİLDİRİ OTURUMU 4

**Oturum Başkanları: Oğuzhan Gökalt, Özkan Tehli**

- S-054 Neglected case of cervical meningocele in an adult  
*Ismail Bozkurt*
- S-055 Functional and Radiologic Outcomes of Lumbopelvic Fixation for Sacral Fractures  
*Süha Ahmet Aktaş*
- S-056 Is posterior fusion surgery successful in the treatment of neuromuscular scoliosis?  
*Uğur Özdemir*
- S-057 Bispectral Index (BIS) Monitoring in Endoscopic Lumbar Spine Surgery: Retrospective Analysis of Central Nervous System Complications  
*Mustafa Özyıldırım*
- S-058 Variations in the Extension of the L5 Transverse Process to the Sacrum and Impact on Lumbosacral Fusion Surgery  
*Buse Sarıgül*
- S-059 Results of 360 Degree Fixation with Spinal Instruments in Pelvic Injuries with Spinopelvic Instability  
*Çağrı Havıçcioğlu*
- S-060 Effect of irrigation with saline of the vertebral body before cementing on postop pulmonary artery pressure in vertebroplasty  
*Mehmet Akif Çağan*
- S-061 Is craniocervical junction affected after surgery in pediatric idiopathic scoliosis?  
*Mehmet Çetinkaya*



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- S-062 Clinical Conflicts Between Cervical Disc Herniations and Rotator Cuff Diseases  
*Benan Baysoy Avinçsal*
- S-063 Comparison of posterior 2 rod instrumentation with 3 rod instrumentation in corrective spine fusion procedures and risk for mechanical failure  
*Ismail Tuter*
- S-064 Approach To Posttraumatic Spinal Arachnoid Cysts In Traumatic Vertebra Fracture Treatments  
*İnan Gezgin*
- S-065 Transforaminal Injection Treatment of Lumbar Disc Herniation: Platelet-Rich Plasma versus Steroid with Platelet-Rich Plasma  
*Mehmet Fatih Aksay*
- S-066 The effect of blood pressure value on intraoperative imaging in biportal endoscopic spine surgery  
*Mehmet Can Gezer*
- S-067 Analysis of the quality, reliability and educational content of YouTube videos on unilateral biportal endoscopic spine surgery  
*Murat Korkmaz*
- S-068 The effect of clinical and radiological parameters on quality of life in untreated adolescent idiopathic patients in adulthood  
*Ömer Erşen*

## 13:00-14:15 SERBEST BİLDİRİ OTURUMU 5 Oturum Başkanları: Vugar Nabi, Yahya Turan

- S-069 Untreated unilateral hip dislocation associated with cerebral palsy scoliosis.  
*Sertaç Meydaneri*
- S-070 Adaptation and Validation of the Turkish Version of the Quality of Life Profile for Spinal Deformities in Idiopathic Scoliosis  
*Yekta Furkan Altın*
- S-071 Cases Of Facet Dislocation After Cervical Trauma: Our Clinical Experiences  
*Mehmet Cemal İçağan*
- S-072 Fusion level in the surgical treatment of unstable tricolomber vertebra fractures; short segment or long segment?  
*Selahaddin Aydemir*
- S-073 Assessing sagittal balance measurement in patients undergoing posterior segmental instrumentation: A comparison of peek rods and titanium rods  
*Halis Emre Ciftci*



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SALON 3

- S-074 Comparison of Unilateral Dynamic Stabilization and Bilateral Dynamic Stabilization in Short Segment Spinal Pathologies  
*Mehmet Yigit Akgun*
- S-075 Comparison Of Surgical Techniques And Localization in Operated Giant Disc Herniations  
*Muhammet Talha Yıldırım*
- S-076 The Effect of Asymmetrical Loading on Bone Density Distribution in Adolescent Idiopathic Scoliosis Cases  
*Kadir Abul*
- S-077 Selection of Levels in Patients Over 70 Years of Age with Osteoporotic Canal Stenosis  
*Ali Murat Başak*
- S-078 Our Clinical Experience in Patients who Underwent Bilateral Decompression Surgery with Unilateral Approach and Diagnosis of Degenerative Lumbar Spinal Stenosis  
*Luay Şerifoğlu*
- S-079 Minimal invasive surgery in the spine with lumbar degenerative deformity and spinal stenosis: 25 Cases  
*Ali Harmanoğullarından*
- S-080 Minimally Invasive Approach to Osteoporotic Vertebral Fractures, Balloon Kyphoplasty Results on Low Back Pain, Clinical Trial  
*Şule Göktürk*

14:15-14:30 Ara

## 15:00-16:30 SERBET BİLDİRİ OTURUMU 6

**Oturum Başkanları: Mustafa Erkan İnanmaz, Hüseyin Berk Benek**

- S-081 Investigation Of The Effects Of Exercise On Pulmonary Function, Spinal Structure And Mobility In Individuals With Adolescent Idiopathic Scoliosis  
*Ebru Çankaya Özdemir*
- S-082 Vertebral Osteoid Osteoma, Facet Joint Protective Technical Method with Case Presentation  
*Kadir Abul*
- S-083 Surgical Treatment Results Of Adult Tethered Spinal Cord Syndrome  
*Mehmet Meral*
- S-084 Intracranial Complications After Lumbar Spinal Surgery: Our Clinical Experience  
*Mehmet İçaçan*
- S-085 Challenges Of Revision Surgery In Spinal Instrumentation And Methods Used  
*Mustafa Arıcı*



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SALON 3

- S-086 Comparison of two posterior instrumentation techniques in multilevel cervical spondylotic myelopathy treatment: Lateral mass screw fixation vs pedicle screw fixation  
*Zeki Boğa*
- S-087 Retrospective analysis of patients operated due to neural tube defect in our clinic  
*Yunus Emre Yılmaz*
- S-088 Screwing the lower cervical pedicle with the use of perop of the 3D model  
*Mert Arslan*
- S-089 Untreated unilateral hip dislocation associated with cerebral palsy scoliosis.  
*Sertaç Meydaneri*
- S-090 Surgical and Clinical Results in Patients with Spinal Osseous Malignant Tumors  
*Aykut Akpınar*
- S-091 Efficacy of foraminal injection and facet ablation treatment for lumbar degenerative disease  
*Taha Furkan Yağcı*
- S-092 Vertebral Aneurysmal Bone Cyst in the Pediatric Age and Management of Its Treatment  
*Abdurrahman Aycan*
- S-093 The major differences of coronal and sagittal sections on pediatric term scoliosis during halo gravity traction treatment  
*Dila Genceroğlu*
- S-094 Comparison Of Spine Structure And Mobility And Postural Stability In Women With And Without Hyperkyphosis: A Case-control Study  
*Hilal Uzunlar*
- S-095 Comparison Of Transforaminal Injection And Combined Radio Frequency Ablation In Patients With Lumbar Disc Herni  
*Mehmet Kürşat Karadağ*



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SALON 1

**08:30-10:00 PANEL 15: Kifoz-I / Scheuermann**  
**Oturum Başkanları: Şevki Erdem, Fatih Keskin**

08:30-08:45	Adölesanda kifoz. Ne zaman postüral?	Safa Satoğlu
08:45-09:00	Scheuermann hastalığı etioloji ve tanımlama ve tedavi endikasyonu	Serhat Pusat
09:00-09:15	Scheuermann kifozunda cerrahi planlama ve teknik trikler	Güçlühan Güçlü
09:15-09:30	Scheuermann kifozunda komplikasyon yönetimi	Mustafa Erkan İnanmaz
09:30-09:45	Kifozda konservatif tedavi seçenekleri	Ömer Erşen
09:45-10:00	Tartışma	

10:00-10:30 Kahve Arası

**10:30-12:00 PANEL 17: Kifoz-II**  
**Oturum Başkanları: Tuna Pehlivanoğlu, İlker Solmaz**

10:30-10:45	Konjenital kifoz	Murat Öztürk
10:45-11:00	Posttravmatik kifoz	Eralp Çetinalp
11:00-11:15	Laminektomi sonrası kifoz	Hakan Somay
11:15-11:30	İatrojenik veya primer enfeksiyon sonrası kifoz yönetimi	Turgut Akgül
11:30-11:45	Geriatrik hastalarda kifoz yönetimi	Ender Köktekir
11:45-12:00	Tartışma	

12:00 KAPANIŞ



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SALON 2

## 08:30-10:00 PANEL 16: Zor Hasta

**Oturum Başkanları: Teoman Benli, Cüneyt Temiz**

- 08:30-08:45 İhmal edilmiş pediatrik deformitelerin yönetimi  
08:45-09:00 Revizyonun revizyonu.... ∞  
09:00-09:15 Parkinsonlu hastada deformite cerrahisi  
09:15-09:30 Romatolojik hastalıklarda (RA,AS) deformite cerrahisi  
09:30-09:45 Kalça problemlili deformite hastası  
09:45-10:00 Tartışma

M. Bülent Balioğlu  
Mesut Yılmaz  
Zafer Orkun Toktaş  
Ender Ofloğlu  
Mahir Gülşen

10:00-10:30 Kahve Arası

## 10:30-12:00 Panel 18: Olgu Sunumu Oturumu

**Oturum Başkanları: Bilgehan Tosun, Ertuğrul Çakır**

- 10:30-10:45 Erişkin deformite distal bileşke yetmezliği / sakrum vidası sorunları  
10:45-11:00 Erişkin deformitede minimal cerrahi  
11:00-11:15 Yüksek dereceli spondilolistezis  
11:15-11:30 Nöromusküler skolyoz olgusu  
11:30-11:45 Komplike olgu 1 - Kalça, Diz, Bel  
11:45-12:00 Komplike olgu 2 - Revizyonun revizyonunun revizyonu

Serdar Akalın  
Buse Sarıgül  
Bilgehan Tosun  
Ali Börekçi  
Alper Gökçe  
Ali Fatih Ramazanoğlu



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SALON 3

## 08:30-10:00 SERBEST BİLDİRİ OTURUMU 7

**Oturum Başkanları: Engin Çetin, Tefik Yılmaz**

- S-096 Long-term results of patients with spinal stenosis who underwent isolated laminectomy  
*Bahadır Doğu*
- S-097 Two Different Approaches in Recurrent Lumbar Disc Hernia: Re-Discectomy+ Foraminotomy or Discectomy+F oraminotomy+Unilateral Dynamic Instrumentation  
*Ali İhsan Ökten*
- S-098 Fatty Infiltration of the Erector Spinae at Upper Low Back Could be a Landmark for Low Back Pain  
*Emel Ece Özcan-Ekşi*
- S-099 A Promising Post Operative Prediction Of Decompression Of Stenosis In With Incompatible Clinic And Radiologic Images  
*Tarık Yazar*
- S-100 Osteoporosis could be associated with fatty psoas at upper lumbar levels: A possible mechanism underlying proximal junctional disorders  
*Emel Ece Özcan-Ekşi*
- S-101 Retrospective Evaluation Of 39 Chiari Malformation Cases Operated In Our Clinic  
*Muhammet Talha Yıldırım*
- S-102 Evaluation of the Efficacy of Anterior Corpectomy and Laminoplasty Techniques Applied in Cervical Spondylotic Myelopathy on Radiological Improvement  
*Mehmet Beşir Sürme*
- S-103 Bilateral Transforaminal Microdiscectomy (TFMD) Combined with Ponte Osteotomy in Thoracal Disc Surgery  
*Ahmet Öğrenci*
- S-104 Effects Of Oxidative Stress-related Biochemical Markers On Disease Process In Patients With Advanced Lumbar Spondylolisthesis  
*Ozan Aydogdu*
- S-105 Posterior Cervical Floating Laminotomy And Our Clinical Experiences  
*Barış Kaval*
- S-106 For Whom The Bells Are Ringing?: An Age- And Gender-matched Cross-sectional Analysis Of Inflammatory Markers In Patients With Low Back Pain  
*Gürkan Berikol*
- S-107 Chordoma, Our Clinical Experience: Single Center Retrospective Study  
*Dilek Karadağ*
- S-108 Usage Of Dynamic System in the Surgical Treatment of Adult Sagittal Deformity  
*Mehmet Yiğit Akgün*

10:00-10:30 Kahve Arası



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## 10:30-12:00 SERBEST BİLDİRİ OTURUMU 8

**Oturum Başkanları: Safa Satoğlu, Ahmet Hilmi Kaya**

- S-109 Spinal Trauma After Earthquake  
*Gulyara Çiğdem*
- S-110 Evaluation Of Demography And Pathologies Of Pediatric Age Group Spinal Tumors According To The Literature  
*Abdulmutalip Karaaslanlı*
- S-111 The Effect of Dextrose Prolotherapy in Chronic Low Back Pain  
*Mehmet Yılmaz*
- S-112 The effect of accompanying limb length inequality on the spine in patients with polio sequelae  
*Ahmet Cemil Turan*
- S-113 A Significant Problem After Spinal Surgery, Which Should Not Be Skipped In Poor Prognosis; Tumoral Lesions  
*Bilal Aykaç*
- S-114 Treatment Of A Patient With Paraplegic L3-4 Dislocation And L4 Vertebral Fracture After A Paragliding Accident: 15-year Follow-up Case Report  
*Halil Gök*
- S-115 C1-2 Importance Of 3d Examinations And Case Analysis In Fusion Surgery  
*Yusuf Kılıç*
- S-116 Clinical Experience Of The Traumatic Patients Operated With Anterior Cervical Corpectomy, Iliac Graft, and Anterior Plate Fixation  
*Hüseyin Berk Benek*
- S-117 Spino-pelvic reconstruction combined with vascularised fibular graft in the treatment of Ewing sarcoma following type 1 internal hemipelvectomy  
*Hüseyin Sina Coşkun*
- S-118 Retrospective Analysis Of 64 Patients Treated For Spondylodiscitis  
*Bekir Murat Doger*
- S-119 The Study Of The Factors Causing Lumbar Rotatory Scoliosis With Anatomical Parameters  
*Ş. Berat VURAL*
- S-120 Clinical and Radiological Outcomes of Unilateral Stabilization and Decompression Surgery in Degenerative Lumbar Spine Disease.  
*Melihcan Savaşçı*
- S-121 Screwing Technique after Vertebroplasty Cement in Osteoporotic Patients  
*Mustafa Arıcı*



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# SÖZLÜ SUNUMLAR





## S-001

### INVESTIGATION OF PAIN PATHWAY TRACTOGRAPHY AFTER SPINE CORRECTION SURGERY IN INDIVIDUALS WITH IDIOPATHIC SCOLIOSIS

Ahmet PAYAS<sup>1</sup>, Emre BAL<sup>2</sup>, Duygu EKİNCİ<sup>3</sup>, Sabri BATIN<sup>4</sup>

<sup>1</sup>Hitit University, Vocational College of Sungurlu

<sup>2</sup>Fatih Sultan Mehmet Education and Training Hospital, Orthopedics and Traumatology Department

<sup>3</sup>Kayseri City Education and Training Hospital, Child Health and Diseases Department

<sup>4</sup>Kayseri City Education and Training Hospital, Orthopedics and Traumatology Department

**Aim:** Studies have shown that in individuals with idiopathic scoliosis (IS), low back, back and neck pain, which increases in severity with the increase in major curvature, decreases or completely disappears after spine correction surgery. These studies are based on the statement of the individual with IS. Therefore, it has not been investigated what kind of changes occur in the pain pathways in the brain. In this planned study; the pain pathways in the brain of healthy individuals will be compared with individuals with IS who underwent surgery and did not undergo surgery.

**Method:** In the study, 15 healthy, 15 non-operated IS individuals and 15 operated IS individuals were included. All of the individuals included in the prospectively planned study are predominantly right-handed. Bilateral tractography of the pain pathways in the medial lemniscus (ML) was performed on the diffusion brain magnetic resonance imaging of the participants using DSI Studio software. Statistical analysis of this study was performed with IBM SPSS 23.0 software and  $p < 0.05$  values were considered statistically significant.

**Results:** Significant differences were found in the parameters of pain pathways between the groups. Values such as fiber number and fiber percentage in pain pathways of individuals with non-operational IS were found to be significantly higher than those of healthy individuals who underwent surgery ( $p < 0.05$ ). There was no significant difference in values such as fiber count and fiber percentage between individuals with IS who had surgery and healthy individuals ( $p > 0.05$ ).

**Conclusion:** It is seen that the pain pathway values of individuals with IS who have undergone surgery are closer to healthy individuals. Unlike survey studies, it was tried to quantitatively show that the pain of individuals with IS decreased after surgery.

**Keywords:** Idiopathic Scoliosis, Tractography, Pain, Spine Correction Surgery



**S-002**

**INTRAOPERATIVE NEUROPHYSIOLOGICAL MONITORING CHANGES IN POST-TRAUMATIC SPINAL FRACTURES**

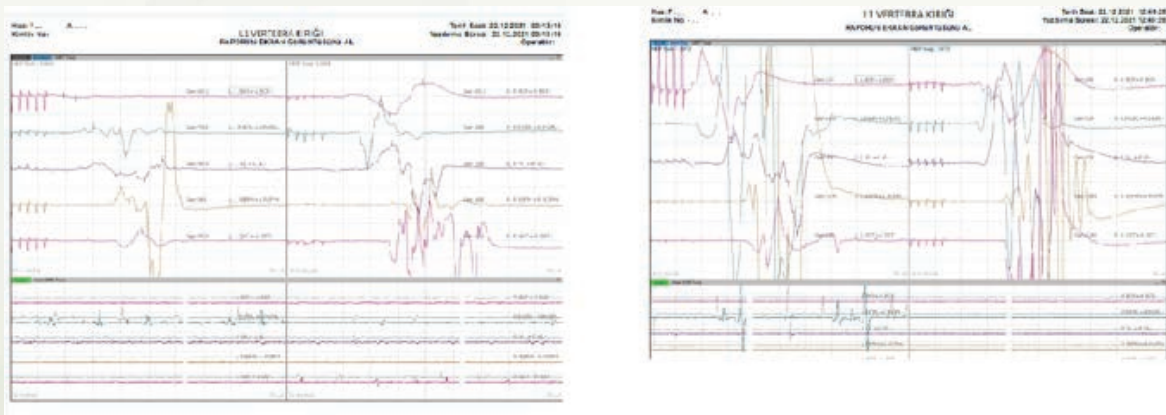
Yusuf ALTUNTAŞ<sup>1</sup>, İsmail TÜTER<sup>1</sup>, Mehmet Ali TALMAÇ<sup>1</sup>, Necmi CAM<sup>1</sup>, Hacı Mustafa ÖZDEMİR<sup>1</sup>

<sup>1</sup>S.B.U. Şişli Hamidiye Etfal Training and Research Hospital, Department of Orthopedics and Traumatology, ISTANBUL, TURKEY

**Aim:** Screw implantation, osteotomy and correction etc. are major high-risk manipulations that can cause neurological impairment during vertebral surgeries. On the other hand, in vertebral fractures, neurological impairment may be experienced during the preoperative preparation phase when the patient is placed in the prone position. The purpose of this study is to investigate and emphasize the importance of intraoperative neurophysiological monitoring (IONM) techniques used to monitor spinal cord and nerve root function during patient positional changing and intraoperatively in spine fracture surgery.

**Method:** A prospective study of 144 patients who received IONM during spine fracture surgery between 2017-2022. Intraoperative continuous EMG and motor-evoked potentials of the spinal cord were evaluated. IONM is an effective method of monitoring the spinal cord functional integrity during spine surgery and can help to reduce the risk of neurological deficit by alerting the surgeon when monitoring changes are observed. The TcMEP stimulating electrodes were placed on the scalp. The TcMEP was recorded from the needle electrodes placed on muscles, including the vastus lateralis, tibialis anterior, peroneal long muscle, gastrocnemius, and abductor hallucis. A stimulation intensity that ranged within 100-400V was presented to the scalp at an interstimulus interval of 2ms for a duration of 300µs.

The first and last image



**Results:** In our study, 42 of 144 patients had preoperative complete motor deficit and 29 had vertebral fracture-dislocation. In 95 of the other patients, preoperative neurophysiological responses were low, but postoperative motor and sensory deficits were not observed after decompression and fixation. In the remaining 7 patients,



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five-minutes after the patient was placed in the prone position, the IONM team detected a positive change in the motor responses of the patient's bilateral lower extremities and alerted the surgical team in a timely manner. The surgical team recognized the risk of severe spinal cord compression and therefore promptly replaced the surgical plan with an immediate, open approach for decompression and reduction of the fracture. The patient was standing on the second postoperative day and was pain-free at six weeks and had no other neurological symptoms.

**Conclusion:** It is appreciated that the complication rate of spinal surgery is high, and there is also a significant risk of neurological injury. The combination of monitoring the ascending and descending pathways can provide more sensitive and specific results, giving the surgeon immediate feedback information and warning about certain neurological changes during surgery. In conclusion, IONM of the spinal cord is an effective and guiding method for monitoring during spinal surgery.

**Keywords:** spine fracture, Intraoperative neurophysiological monitoring (IONM), neurological lesion, spinal cord, motor evoked potential



**S-003**

## **INTRADISCAL VACUUM PHENOMENON IN SPINAL STENOSIS WITH STABILISATION: A SINGLE-CENTRE RETROSPECTIVE STUDY**

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**Aim:** Vacuum phenomenon is the accumulation of non-infectious gas in the intervertebral space, which should not normally contain gas in the body. It is a low-density gas that usually occurs in the disc space due to degeneration of the nucleus pulposus and evaporation of the surrounding fluids with vacuum. The mechanism is not well understood. The aim of our study was to investigate the response to spinal stabilisation of the presence of a vacuum phenomenon detected by imaging, the duration of this response and its effect on patients.

**Method:** The study included 125 patients who underwent spinal stabilisation at the Neurosurgery Department of Pamukkale University. Patients with a history of malignancy, metabolic disease and spinal infection were excluded. Age, sex, operated spinal level, type of cage used, if any, laminectomy levels, if any, preoperative and postoperative intervertebral air appearance and levels, revision, if any, implant loosening and comorbidities were recorded and evaluated.

**Results:** Of the patients analysed, 26 were male and the remaining 99 were female. The mean age was 61.49 years. Considering the transpedicular screw procedures in the patients undergoing spinal stabilisation, L5 was the most instrumented vertebra with 119 screws, while L4 was the second most instrumented vertebra with 118 screws. This was followed by L3, S1, L2, L1, T12, T11, T10 (2 screws). Intervertebral cage was applied in 29 patients and laminectomy was performed in 87 patients. When the preoperative CT images of the patients were analysed, a vacuum phenomenon was detected in 87 of them. In the control CT images taken within the first 24 hours after surgery, intervertebral air was found to have disappeared in 39 of these patients, and in the late control CT images, intervertebral air was found to have disappeared in 82 patients. Screw loosening was observed in 9 of the operated patients, 7 of whom had osteoporosis.

**Conclusion:** The fact that intervertebral air is found in approximately 70% of CT images of patients presenting to our clinic with back pain, especially after the 6th decade, shows that this phenomenon is highly correlated with age. We observe that stabilisation, independent of cage application, largely eliminates the vacuum phenomenon, especially in the late period. Although the inability to perform imaging studies at the same time intervals in all patients is one of the limitations of this study, it does not hurt to present it as an indication that transpedicular instrumentation prevents pathological vertebral movements.

**Keywords:** vacuum phenomenon, stabilisation, back pain



S-004

## BLOOD TRANSFUSION IN ADOLESCENT IDIOPATHIC SCOLIOSIS SURGERY: IS IT NECESSARY?

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**Aim:** During pandemic most of the health care services focused on Covid 19 related issues. One of the critical result of this period was decrease in blood donation. Turkish Red Crescent reported that they had a reserve below the critical blood reserve level in their stocks. For this purpose, training activities were organized in order to raise awareness of transfusion. In this study, we wanted to present our transfusion experience in AIS surgery with the contributions of these trainings.

**Method:** Patients who underwent posterior instrumentation(>7 levels) and fusion (PIF) between June 2022 and September 2022 were included to the study. Patient demographics and hemodynamic parameters during intraoperative and postoperative period were recorded. All surgical procedures performed by single surgeon with maintenance of low blood pressure and also preoperative IV tranexamic acid infusion routinely received by all patients. We did not use additional blood saving methods (Cell saver or autogenic transfusion). Lactic acid and base excess levels were recorded in the intraoperative period and during ICU stay. These parameters were compared with the last visit lab results. Statistical analysis was performed with non parametric Friedman test. A  $p < 0.05$  value was set for statistical significance.

**Results:** 12 patients (3M/9F) who underwent PIF without thoracoplasty or osteotomy were included to study. Mean age was 15 (14-17). Mean preoperative Hb: 13.1 gr/dl (12-13.6) Mean Preoperative Htc: 39.12 (37-44) Mean number of levels fused 10.1 (7-12) Mean screw numbers 20.1 (14-24). Mean hospital stay 4.28 (3-7). Mean Lac value was 1.45 (0.65-2.3) mmol/l; mean value Base excess -1.3 mmol/l (between -2.8 and +1.96) . Postoperative 3rd month mean Hb: 12.47 gr/dl (12.1-13.7) and Htc: 37.91% (37-42).

16 yo female, Early postoperative image of T4-L3 Posterior instrumentation and fusion





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**Conclusion:** Transfusion practice may change widely according to surgeon and hospital differences. Due to findings of this short report; with maintenance of targeted normal levels of Lactate ( $<2\text{mmol/l}$ ) and Base excess (between  $-2\text{mmol/l}$  and  $+2\text{ mmol/l}$ ) PIF (without thoracoplasty and osteotomies) for treatment of AIS can be performed safely without need of blood transfusion. Implementing institutional transfusion protocols and trainings may reduce transfusion related costs and complications.

**Keywords:** adolescent idiopathic scoliosis, posterior instrumentation and fusion, blood transfusion, deformity surgery, lactate and base excess



S-005

## HOW TO BEST RESTORE THE PELVIC VERSION DURING ADULT SPINAL DEFORMITY SURGERY

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**Aim:** Poor restoration of relative pelvic version (RPV) during adult spinal deformity surgery is linked to increased risk of mechanical complications and worse patient reported outcomes. We hypothesized that there are surgical maneuvers that can help improve pelvic version restoration. The aim of the study was to analyze the factors associated with the improvement of postoperative RPV.

**Method:** A retrospective analysis was performed on a prospective multi-center adult spinal deformity database. Operative patients with a severe preoperative pelvic retroversion as per the GAP score ( $RPV < -15^\circ$ ) who underwent a pan-lumbar fusion to pelvis (minimum UIV=L1) and had a minimum of 2 years of follow-up were included. Patients were assigned to groups A or B according to whether they had postoperative improvement of RPV or not, respectively. Differences between groups were analyzed for baseline demographics, frailty and comorbidities, preoperative sagittal parameters, surgical factors, and postoperative sagittal parameters at 6-weeks, 6-months, 1-year, and 2-years follow-up time-points. Descriptive statistics, parametric and non-parametric analyses were used.

**Results:** 177 patients (153F, 24M) met the inclusion criteria. The median age at surgery was 67 years. Groups were homogeneous in baseline demographics, frailty and comorbidities, and preoperative sagittal parameters ( $p > 0.05$ ). Patients that had improved postoperative RPV values (Group A) had longer instrumentations (11.45 vs 10;  $p = 0.047$ ), higher frequency of Anterior Lumbar Interbody Fusions (ALIF) ( $OR = 6.66$ ;  $p = 0.049$ ), more posterior column osteotomies ( $OR = 4.96$ ;  $p < 0.001$ ), more 3-column osteotomies ( $OR = 2.31$ ;  $p = 0.041$ ), longer median hospitalization time (13 vs 11;  $p = 0.045$ ), lower percentage of Transforaminal Lumbar Interbody Fusions ( $OR = 0.45$ ;  $p = 0.028$ ), and lower number of decompressed level ( $OR = 0.44$ ;  $p = 0.024$ ). Patients in Group A obtained better L4-S1 segment alignment and Relative Lumbar Lordosis (RLL), which, in turn, led to improved RPV and global alignment. All postoperative sagittal parameters remained significantly better in group A patients through all follow-up time-points. Nonetheless, in group A, the parameters had a tendency to slide into a lower category over the course of the two postoperative years, and the difference in the GAP score among groups seemed to diminish over time.



S-005

### Restoration of Spinopelvic Parameters

Differences ( $\Delta$ ) between postoperative (6 weeks) and preoperative values of the sagittal parameters

	Group A	Group B	p
$\Delta$ SS	12.54°	2.68°	<0.001
$\Delta$ L4-S1 angle	-11.38°	-0.62°	<0.001
$\Delta$ RPV	14.26°	2.7°	<0.001
$\Delta$ RLL	30.55°	22.73°	<0.001
$\Delta$ LDI	-0.51	-0.34	0.83
$\Delta$ RSA	-25.92°	-11.21°	<0.001
$\Delta$ GAP score	-8	-2.5	<0.001
$\Delta$ T4PA	-19.37°	-10.15°	<0.001
$\Delta$ L1PA	-9.76°	-1.85°	<0.001

SS = Sacral Slope  
RPV = Relative Pelvic Version  
RLL = Relative Lumbar Lordosis  
LDI = Lumbar Distribution Index  
RSA = Relative Spinopelvic Alignment  
GAP = Global Alignment and Proportion  
T4PA = T4 Pelvic Angle  
L1PA = L1 Pelvic Angle

**Conclusion:** Patients with improved pelvic version after surgery had undergone more ALIF and 3CO procedures. These surgical actions were associated with better L4-S1 and L1-S1 (thus RLL) lordosis restoration, indirectly improving all other sagittal parameters, including the Relative Pelvic Version. Patients that had improved postoperative RPV values consistently maintained better results in all sagittal parameters throughout the follow-up, although the maintenance of these results over longer durations of follow-up is yet to be clarified.

**Keywords:** adult spinal deformity, relative pelvic version, corrective surgical actions, alignment planning



S-006

## LUMBAR SPINE MOTION AND ENDURANCE AFTER VERTEBRAL BODY TETHERING AND SELECTIVE THORACAL FUSION IN PATIENTS WITH IDIOPATHIC SCOLIOSIS

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**Aim:** Vertebral body tethering (VBT) is a non-fusion, motion-preserving surgery for adolescent idiopathic scoliosis (AIS). This study aimed to investigate lumbar motion and muscle change after VBT surgery by comparing to selective thoracal fusion surgery (STF).

**Method:** We performed a prospective study that included 16 patients (13 female, 3 male) who underwent either VBT or STF for AIS. An isokinetic dynamometer was used to assess the trunk extensor and flexor muscle strength and endurance. A dual inclinometer was used to determine the range of motion (ROM) of the lumbar region. In the calculation of muscle mass, the bilateral multifidus, erector spina, and psoas muscles were evaluated in T2A axial sections at the L2 and L5 vertebral corpus plateau superior in MRI images. The Goutallier classification was used to assess the degree of fatty degeneration. Measurement of spinal curvatures was conducted using Surgimap software.

**Results:** In the VBT group, among the 8 patients (7 females, 1 male) with a mean surgical age of  $14.2 \pm 1.4$  years and a mean follow-up time of  $19.2 \pm 8.6$  months. In the STF group, 8 patients (6 females, 2 males) with a mean surgical age of  $14.6 \pm 1.8$  and a mean follow-up period of  $29.5 \pm 15.4$  months were included. There was no significant difference between both groups' lumbar range of motion, trunk flexion-extension strength, and endurance ( $P > 0.05$ ). There was no significant difference between paraspinal muscles cross section area (CSA) and the degrees of fatty degeneration in the preoperative and last follow-up of the patients.

**Conclusion:** These preliminary data indicate that VBT applied to the lumbar region preserved lumbar region movement and did not cause iatrogenic damage to the paraspinal muscles. The study showed that the cross-sectional area or fatty degeneration of the paraspinal muscles remained unchanged postop in VBT group even on the side of the surgery.

**Keywords:** Vertebral body tethering, motion-preserving surgery, cross-section area, nonfusion spine surgery



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## DIFFERENT C2 SCREW PLACEMENT TECHNIQUE WITH MOBILIZATION OF THE VERTEBRAL ARTERY IN HIGH-RIDING VERTEBRAL ARTERY CASES: CADAVER DISSECTION

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**Aim:** In neurosurgery, posterior approaches intended at the craniovertebral junction are frequently used. The most popular procedures for treating upper cervical instability are C1 lateral mass, C2 pedicle, and C1-C2 transarticular screw stabilization. Due to their proximity to neural structures and the presence of the high-riding vertebral artery, these techniques are complicated. By mobilizing the vertebral artery, the risk of VA damage can be decreased. Using cadaveric specimens in this study was aimed to demonstrate C2 pedicle and C1-C2 transarticular screw placement with vertebral artery mobilization and a novel C2 screw placement technique

**Method:** In this study, twelve adult cadaveric specimens and two adult dry cadaveric C2 bones were used with the permission and decision of the University Research Ethics Committee. Colored silicone was injected into the arteries and veins of these twelve cadaveric specimens. Then, muscle dissection was performed stepwise, and the C2 vertebrae of the cadavers were revealed with a Surgical Microscope. Each specimen and entire stages of the dissections were recorded photographically. After cadaver dissections were completed and screw placement was performed with three different techniques, radiological imaging was done with fluoroscopy.

**Results:** After dissection, the lateral mass of the C2 vertebra was observed, and lateral to it the transverse process and foramen were detected with the help of a hook. Next, the posterior wall of the vertebral artery groove was removed until the vertebral artery loop could partially be observed to mobilize the vertebral artery using a 1 mm thin plate Kerrison rongeur. This enables us to find the top of the loop of the vertebral artery and mobilize it inferiorly by using a dissector. Following this step, the C1-2 transarticular, C2 pedicle, and the novel C2 inferior corpus screw placement can be performed safely by directly visualizing the artery (Figure 1).



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**Conclusion:** Due to the nearby neurologic and vascular structures, placing the C2 pedicle and C1-2 transarticular screw is a challenging procedure, especially in high-riding vertebral artery cases. However, it is possible to place the C2 pedicle, C1-2 transarticular, and novel C2 inferior corpus screw after the mobilization of the vertebral artery. This study aimed to show all of them together on a cadaver for the first time, to understand the anatomy of the C2 vertebra, and to use screw placement techniques to minimize the risk of complications.

Figure1

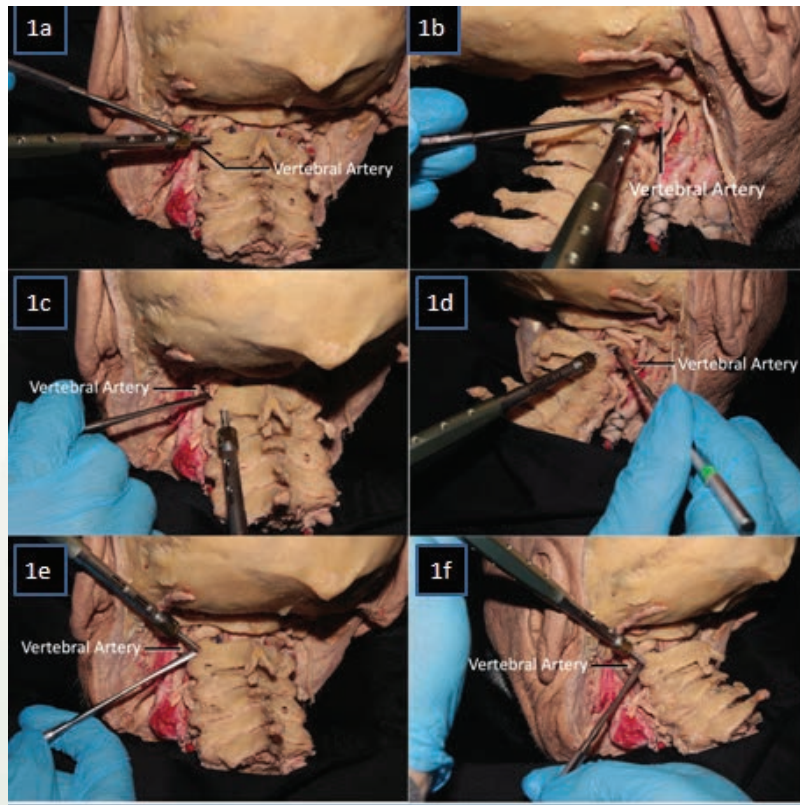


Figure 1. After removing the posterior part of the vertebral artery groove and mobilizing the vertebral artery to the inferior and lateral with the help of the dissector. C2 pedicle screw placement (a,b), C2 screw placement with Magerl technique (c,d), and novel C2 inferior corpus screw placement technique (e, f) are seen.



**S-008**

## FUNCTIONAL OUTCOMES AND HEALTH RELATED QUALITY OF LIFE OF PATIENTS UNDERWENT TRAUMATIC SPINO-PELVIC DISSOCIATION TREATED WITH BILATERAL TRIANGULAR OSTEOSYNTHESIS

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**Aim:** Traumatic spino-pelvic dissociation (SPD) represents a specific pattern of injury involving sacral fractures characterized by combined vertical and horizontal fracture elements. This pattern results in discontinuity between the sacrum and ilium, leading to instability in both the sagittal and axial planes. The objective of this study was to assess the changes in functional outcomes and Health Related Quality of Life (HRQoL) of patients with traumatic spino-pelvic dissociation underwent bilateral triangular osteosynthesis (TOS).

**Method:** During the period of October 2015 and April 2021, 34 patients with SPD were admitted to our centre and included in this single-centre prospective cohort study. Bilateral TOS was performed to manage all patients with SPD. The functional outcomes for fractures were analyzed with Majeed function assessment. HRQoL was assessed with the EQ-6D questionnaire. The reduction quality was evaluated according to Matta criterion.

**Results:** There were 21 woman and 13 man with an average age of  $49.4 \pm 7.8$  years (range, 17-64 years). The average follow-up time was  $42.7 \pm 5.2$  months. All sacral fractures were healed in an average time of  $11.1 \pm 3.1$  months. 7 patients with scores more than 2 according to Gibbons classification underwent sacral plexus decompression. According to Matta criterion for fracture reduction, the results were excellent in 23 cases, good in 8 cases and fair in 3 case. According to Majeed functional scoring, the results were excellent in 22 cases, good in 9 cases and fair in 3 cases. The average Gibbons score improved from  $2.5 \pm 0.4$  preoperatively to  $1.2 \pm 0.3$  at 24 months follow-up ( $P < 0.05$ ). Pain and mood disorders mainly influenced patients' present general health status. Complications were noted as wound healing problems (29%), implant loosening (7%) and iatrogenic nerve injury (7%).

Spinopelvic dissociation





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Female, 18-years-old, fall from height associated with bilateral calcaneus fx and left peroneal palsy. Radiograph on admission showing a bilateral vertically located fracture lines on sacrum. Axial CT view of sacrum showing marked bilateral communited fracture lines which represents H-type sacrum fracture

**Conclusion:** According to the data of our study, bilateral TOS demonstrates satisfactory functional outcomes with low complication rates except infection rate in patients with traumatic SPD. HRQoL is mainly dominated by pain and mood disorders. 75.6% of the patients turned back to their original occupation. Implant removal is required to improve the lumbopelvic mobility and functional outcomes.

**Keywords:** Spinopelvic dissociation Triangular osteosynthesis Health-related quality of life



**S-009**

## **A COMPREHENSIVE ANALYSIS OF OUTCOMES AND TREATMENT SUCCESS OF THORACIC, THORACOLUMBAR AND BILATERAL VERTEBRAL BODY TETHERING SURGERY**

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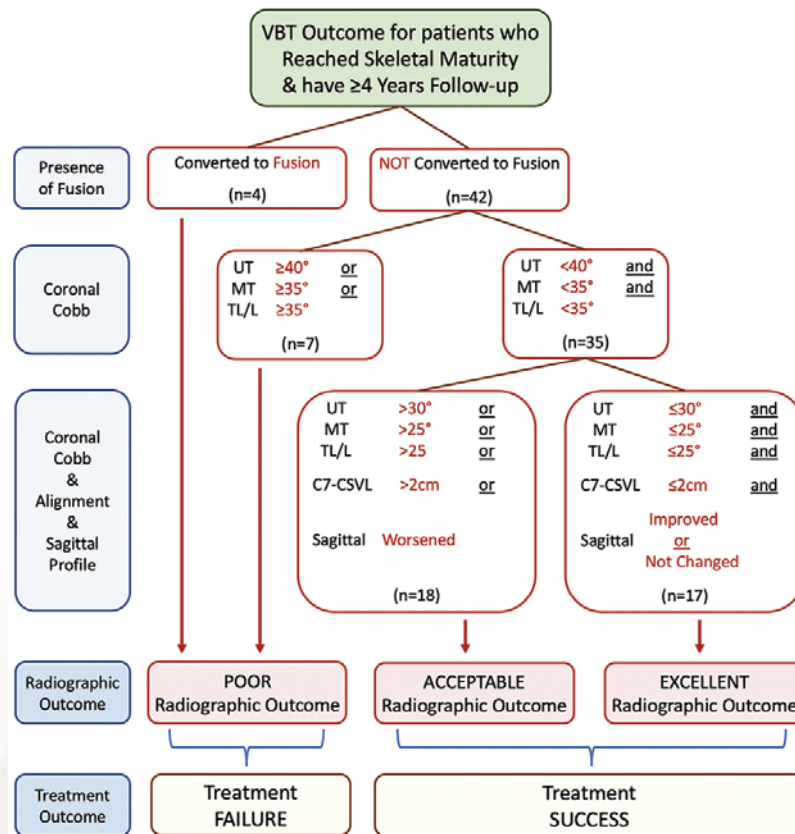
**Aim:** As Vertebral Body Tethering (VBT) treatment evolves, it is important to objectively classify results to be able to analyze clinical and radiographic predictors of successful outcomes and failures. The aim of this study was to determine treatment success rates, and possible factors affecting outcomes.

**Method:** A retrospective analysis was performed on a prospectively collected data. A 3-category radiographic outcome scheme was formulated using reoperations, final follow-up curve magnitudes, coronal alignment and sagittal plane changes (Fig 1). “Excellent” and “acceptable” outcomes were classified as “treatment success”, while “poor” outcomes denoted “treatment failure”. Lenke curve patterns, surgical techniques, and anticipated remaining growth (Triradiate cartilage closure & Sanders classification) were compared using Exact test, Chi-Squared and ANCOVA.



S-009

### Radiographic Outcome Scheme



**Results:** 46 patients (43F, 3M) who underwent thoracic (n=34), thoracolumbar (n=5) and bilateral (n=7) VBT were included. The mean age at surgery was  $12.7 \pm 1.7$  years. At a minimum of 4 years and a mean of 56 (48-93) months follow-up, 17 (37%) patients had excellent, while 18 (39%) had acceptable, and 11 (24%) had poor radiographic outcomes. 4 patients (9%) were converted to fusion. Thoracic VBT (with or without lumbar extension) resulted in higher treatment success (85%) compared with Thoracolumbar (40%) and Bilateral (57%) surgeries ( $p=0.030$ ). Lenke 1 Curves demonstrated higher success (86%; in detail 90%, 90%, 83% and 78% for 1A, 1B, 1C and 1Ar curves, respectively) compared to Lenke 2-3 (33%) and Lenke 5-6 (50%) curves ( $p=0.022$ ). Triradiate cartilage closed patients had a higher success (82%) rate compared to triradiate cartilage open (43%) patients ( $p=0.028$ ). Success rates for Sanders 1-2 (66%), Sanders 3-4 (88%) and Sanders 5-6-7 (71%) patients were similar ( $p=0.384$ ). Patients with treatment success demonstrated better mean SRS-22 satisfaction (4.71 vs 3.85,  $p=0.010$ ) and function (4.6 vs 4.4,  $p=0.044$ ) scores compared with patients with treatment failure at latest follow-up, while other subdomains and the subtotal score were similar ( $p>0.05$ ).

**Conclusion:** Although it is more desirable to preserve motion at the lumbar spine, at its current state, treatment success rate of thoracic VBT surgery is more favorable than that of thoracolumbar and bilateral VBT surgeries. Success rates were higher in triradiate cartilage closed patients, compared to triradiate cartilage open ones. Poor radiographic outcomes resulted with poorer function and satisfaction scores.

**Keywords:** VBT, Vertebral Body Tethering, Nonfusion Surgery, Growth Modulation



**S-010**

**MOLECULAR ANALYSIS OF LEPTIN RECEPTOR IN BONE TISSUE AND SOME MARKERS CAUSING AN INCREASING EFFECT IN BONE TISSUE MASS AT LOMBAR SPINAL STENOSIS PATIENTS WHO NEED TO HAVE SURGICAL TREATMENT**

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**Aim:** Leptin (Lep), a hormone associated with obesity, affects bone metabolism. It is mentioned that bone formation is carried out by the mechanism triggered by the activation of fibroblast growth factor 23 (FGF23) through osteoblasts and chondrocytes that contain leptin receptor (LepR). There are many studies in the literature about the relationship between bone hypertrophy in LSS and obesity. However, there are no studies Lep and bone hypertrophy in the LSS. In our research, it was investigated at the molecular level by measuring at the expression of Lep, LepR and FGF23 in hypertrophic bone tissues excised from LSS patients in need of surgery.

**Method:** After obtaining the approval of Mugla Sitki Kocman University (MSKU) Faculty of Medicine Clinical Research Ethics Committee, the research was conducted prospectively between 2018-2019. MSKU was supported by the BAP-18/071 scientific research project. In the Neurosurgery Clinic of Mugla Training and Research Hospital, 37 patients with inclusion criteria were studied among 155 patients. Lep, LepR and FGF23 gene expression levels were measured by using hypertrophic bone tissues (facets) excised during surgical treatment.

**Results:** 11 patients (30%) with a BMI below 25kg/m<sup>2</sup> constituted the control group, and 26 patients (70%) with a BMI of 25kg/m<sup>2</sup> and above constituted the experimental group. The BMI average was 22 in the control group and 33 in the experimental group. The mean age was 58 years, 50 years in the control group and 62 years in the experimental group. In the gender distribution, 6 (55%) of the control group and 22 (85%) of the experimental group were women. Age and BMI were positively correlated in both groups and were statistically significant (p<0.05). Lep, LepR and FGF23 gene expression levels in hypertrophic bone tissues showed a positive correlation with BMI. Especially Lep expression had a stronger positive correlation in the experimental group than in the control group. Lep - LepR and LepR - FGF23 gene expressions were positively correlated with each other and statistically significant (p< 0.05).

**Conclusion:** Genetic analysis was performed for the first time in the literature on hypertrophic bone tissues excised from LSS patients. The positive correlation of Lep, LepR and FGF23 gene expressions in hypertrophic bones with BMI may offer clues as to how the effect of obesity on bone hypertrophy in LSS occurs at the molecular level. Therefore, we hope that our study will be in an important position for further studies in explaining the pathophysiology of bone hypertrophy in LSS.

**Keywords:** Lombar Spinal Stenosis, Body Mass Index, Leptin, Leptin Receptor, Fibroblast growth Factor 23



**S-011**

## OUR RESULTS OF SPINOPELVIC FIXATION IN VERTICAL UNSTABLE PELVIC FRACTURES AND TRANSVERSE SACRUM FRACTURES.

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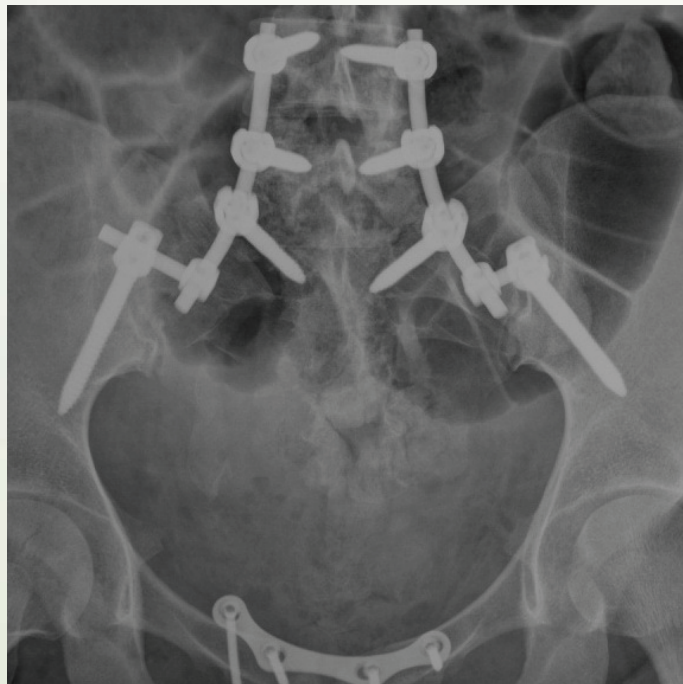
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<sup>2</sup>Dicle University Faculty Of Medicine Orthopaedics And Traumatology

**Aim:** The radiological and clinical results of our patients who underwent spinopelvic fixation in vertical unstable pelvic fractures and transverse sacrum fractures were evaluated and the functions affecting the results were evaluated.

**Method:** 11 patients who underwent SF due to vertical instability and transverse sacrum fractures in Dicle University Faculty of Medicine, Department of Orthopedics and Traumatology between 2017-2020 were retrospectively analyzed. 11 patients who had clinical follow-ups and whose radiological data were appropriate were included in the study. Preoperative tomography was used in the radiological evaluation of the patients, outlet, inlet and lateral sacrum radiography in postoperative follow-up. Majeed Functional Scoring and Hannover Pelvis Scoring were used for functional results. Gibbon Neurological Grade was used for neurological follow-up of the patients.

Radiological image chart of a patient with H type fracture in the sacrum after falling from a height, after preoperative and spinopelvic application.





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**Results:** Seven (63,6%) of the cases were male and 4 (36,4%) were female. The mean age was 24,6 (15–45) years, followed by 12,3 (4–29) months. 1 (9%) of the patients were Denis Zone I, 5 (45,4%) of patients were Denis Zone II and 5 (45,4) of patients were Zone III. The mean time for surgery was 5 (1–19) days. We applied unilateral spinopelvic fixation in five patients, bilateral spinopelvic fixation in 4 patients, and unilateral spinopelvic fixation in 2 patients and bilateral fixation to the lumbar vertebra. We used a single iliac screw for all patients. The mean Gibbons grade before surgery was  $2.9 \pm 1.2$  (1-4). The mean injury severity score(ISS) of the patients was  $41.36 \pm 12$  (29-75). Mean Majed functional score was  $75 \pm 14$  at the last control of the patients. 4 of the patients were excellent, 4 were good and 2 (18.2%) were moderate and 1 (9%) was poor. At the last control, the mean Hannover pelvis outcome score of the patients was  $5.36 \pm 1.5$  (3-7). At the last control, Gibbons grade mean was  $2.18 \pm 1.47$  (1-4). Age, gender and type of trauma do not affect functional outcomes ( $p > 0.05$ ). However, there is a correlation with functional results in terms of preoperative gibbons score, preoperative displacement amount, injury severity score and duration of preoperation ( $p < 0.05$ ).

**Conclusion:** SF in vertical unstable pelvic fractures and transfers sacrum fractures is a procedure that provides early mobilization and early neurological stabilization, has good neurological scores, functional scores, and radiological results.

**Keywords:** sacrum transverse fractures, vertical unstable pelvis fractures, spinopelvic fixation



S-012

## CHANGES IN SEXUAL ACTIVITY IN FEMALE PATIENTS SURGICALLY TREATED FOR KYPHOSIS DUE TO ANKYLOSING SPONDYLITIS

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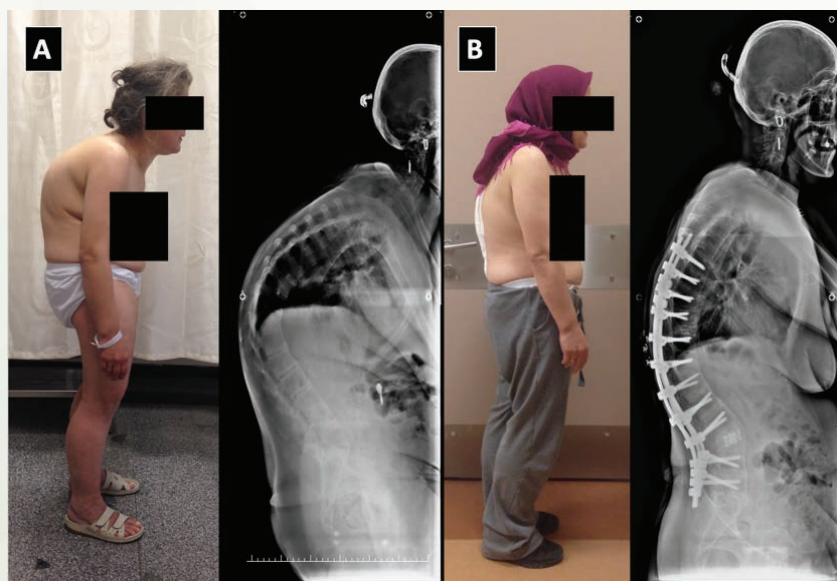
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**Aim:** Serious postural disorders and mobility restrictions due to kyphosis deformity can be seen in female patients with ankylosing spondylitis (AS), and the sexual life and functions of patients can be adversely affected secondary to these. In this study, it was aimed to investigate the effects of surgery on sexual function in women who underwent spinal correction surgery for kyphosis deformity caused by AS.

**Method:** The data of 11 female patients who underwent pedicle subtraction osteotomy due to kyphosis secondary to AS between April 2015 and October 2021 were evaluated. The radiological spinopelvic parameters of the patients before surgery and at least 24 months after surgery were determined as lumbar lordosis (LL), thoracic kyphosis (TK), global kyphosis (GK), pelvic tilt (PT), sacral slope (SS), pelvic incidence (PI), sagittal vertical axis (SVA), osteotomized vertebral angle (OVA) and sexual functions were compared. The female sexual function scale (FSFI) was used to evaluate sexual function. In addition, it was investigated whether there was a relationship between the change in spinopelvic parameters and the change in FSFI.

Figure 1



Preoperative clinical and radiological sagittal image (A) and postoperative clinical and radiological sagittal image of a 41-year-old female patient (B)



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**Results:** The mean age of the patients was  $39.2 \pm 5.8$ , and the mean follow-up time was  $58.9 \pm 31.5$  months. There was a statistically significant difference between the preoperative and postoperative LL ( $p < 0.001$ ), PT ( $p < 0.001$ ), SS ( $p < 0.001$ ), GK ( $p = 0.001$ ), OVA ( $p < 0.001$ ) and SVA ( $p < 0.001$ ) values of the patients. There was no significant difference between PI ( $p = 0.74$ ) and TK ( $p = 0.09$ ) measurements.. There was a significant increase in the total FSFI score of the patients after surgery ( $23.9 \pm 3.8$  vs  $28.2 \pm 3.4$ ,  $p < 0.001$ ). When the FSFI sub-domain scores were evaluated, there was a significant increase in the scores of desire, arousal, satisfaction and orgasm domains, while no significant change was found in the pain and lubrication domains. A significant correlation was found between the increase in total FSFI score and the change in LL ( $r = -0.407$ ,  $p < 0.001$ ) and SVA ( $r = -0.564$ ,  $p < 0.001$ ) angles.

Table 1

Variables	Change in FSFI score	
	r	p value
DPT	0.049	0.555
DPI	0.012	0.886
DSS	0.062	0.455
DLL	-0.407	0.003*
DTK	0.035	0.776
DGK	0.097	0.246
DOVA	0.130	0.334
DSVA	-0.564	0.040*

**Conclusion:** In women, surgical correction of kyphosis deformity caused by AS may improve sexual functions. Spinal sagittal realignment and pelvic rotation may be correlated with improvement of sexual function.

**Keywords:** Ankylosing spondylitis, Kyphosis, Sexual function



## S-013

### SHOULD PELVIC FIXATION BE INCLUDED IN THE SURGICAL TREATMENT OF NEUROMUSCULAR SCOLIOSIS?

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**Aim:** The utilization of pelvic fixation (PF) in the surgical management of neuromuscular scoliosis (NMS) with pelvic obliquity is a common practice, albeit associated with increased complication rates. However, the requisite for PF in NMS patients with pelvic obliquity remains uncertain. The objective of this study is to compare the outcomes of NMS patients with and without PF.

**Method:** A retrospective review was conducted on NMS patients who underwent surgical treatment by two spine surgeons in two different centers. The study included 33 NMS patients aged 10-20 years who had a pelvic obliquity of more than 15° and a minimum follow-up of 24 months. The patients were divided into two groups: non-PF (group 1) and PF (group 2). Group 1 comprised 16 patients (mean age 16.81±1.8 years) and group 2 comprised 17 patients (mean age 15.76±1.2 years). Preoperative, early, and final follow-up radiographs were evaluated, and independent movement levels were assessed using the Gross Motor Function Classification System (GMFCS) before surgery and at the last follow-up.

**Results:** Radiological evaluations were conducted on the patients, with a mean follow-up period of 46.69±21.95 (26-96) months in group 1 and 43.88±20.05 (26-90) months in group 2. The preoperative scoliosis angles were significantly higher in group 1 compared to group 2 (in group 1: 78.0°±15.75; in group 2: 57.59°±19.4). However, there was no significant difference between the two groups in postoperative radiological values (Table). The preoperative pelvic obliquity values were 24.50°±8.5 in group 1 and 20.41°±4.3 in group 2, with greater postoperative improvement observed in group 2. However, there was no statistically significant difference between the two groups. The preoperative GMFCS activity levels of patients with PF were lower compared to group 1 (group 1: 2.75±1.29; group 2: 3.76±1.03) (p=0.028). However, the postoperative activity levels in both groups were similar to the preoperative levels.

**Conclusion:** Our study demonstrated comparable results in terms of activity level and radiological outcomes between NMS patients with and without PF following surgical treatment for PO. Due to the potential complications associated with PF in NMS surgery, posterior surgery without PF may be considered as a viable alternative for NMS patients with pelvic obliquity. These findings suggest that routine PF may not be necessary in this patient population, and individualized treatment plans should be developed based on the patient's specific condition and risk factors.

**Keywords:** Neuromuscular scoliosis, pelvic obliquity, pelvic fixation



## S-014

### ASSESSING CERVICAL LORDOSIS CORRECTION IN ANTERIOR CERVICAL DISC SURGERY: A COMPARISON OF CAGE PLATE AND CAGE-ONLY APPROACHES

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**Aim:** The objective of this study is to compare the effectiveness of cage plate versus cage-only approaches in anterior cervical disc surgery by assessing the cervical lordosis angles before and after surgery. The aim is to determine which method is superior to the other.

**Method:** For this retrospective study, radiological images of patients who received anterior discectomy and fusion for cervical disc herniation at Ankara City Hospital clinic between 2019-2023 were reviewed. The study included a total of 40 patients with a mean age of 49.6, comprising 15 males and 25 females. The patients were divided into two comparison groups: 20 patients who received fusion with cage alone, and 20 patients who received fusion with cage plate.

Cobb method



**Results:** The results revealed that patients who underwent fusion surgery with cage plate had a higher mean preoperative cervical lordosis angle of 8.6, which improved to 13.7 in the postoperative period. On the other hand, patients who underwent fusion with cage alone had a mean preoperative cervical lordosis angle of 8.03, which improved to 12.02 in the postoperative period. The difference in postoperative cervical lordosis angle was found to be more significant in the cage plate group compared to the cage alone group. (Table 1 and 2) Therefore, the use of cage plate was found to be more effective in achieving cervical lordosis alignment in the postoperative period.



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## Cervical lordosis angles

	PREOPERATIVE	POSTOPERATIVE
CAGE	8.03	12.02
CAGE-PLATE	8.6	13.7

**Conclusion:** In conclusion, this study provides evidence that the use of cage plate in anterior cervical discectomy and fusion surgery is superior to cage alone in achieving cervical lordosis alignment.

**Keywords:** Cage, Plate, Anterior Cervical Disc, Cervical Lordosis, Cobb method



S-015

## POSTERIOR CERVICAL FIXATION TECHNIQUES IN CRANIOCERVICAL JUNCTION AND UPPER CERVICAL REGION PATHOLOGIES: CLINICAL EXPERIENCE

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**Aim:** The craniovertebral junction and the upper cervical region have a complex anatomical structure in terms of neuronal, vascular, bones, and ligaments that it contains. For this reason, due to the difficulty of the surgical techniques to be applied, the surgeon needs to know the anatomical features of this region well to decide on the appropriate surgical technique for the treatment of pathologies such as trauma, tumor, infection, or malformations related to the region. In addition, to plan the ideal surgical approach and technique specific to the patient, radiological examinations are needed, which should be carefully evaluated preop. Predicting the instability that may occur during surgery in advance and applying stabilization with the appropriate technique will help prevent complications that may occur later. Among the posterior fixation techniques for this area, which have been identified in previous years, this study was considered to classify the operations performed using fusion techniques to the upper cervical region applied in our clinic according to the pathologies related to the region and decipher the distributions.

**Method:** Posterior fixation surgeries performed on patients admitted Decently due to various craniovertebral junction and upper cervical (C1-C4) region pathologies in our clinic between 2009-2023 were retrospectively examined. The age, gender, primary pathology, developing complications, and early and late complications of the patients were evaluated.

**Results:** Deceleration of the upper cervical region and the craniovertebral junction was applied to 46 patients between 2009 and 2023. Of these, 26 were male patients and 20 were female patients. Surgical indications included 6 os odontineum, 7 basilar invaginations, 25 trauma, 2 Chiari, 5 tumors, and 1 osteomyelitis. C2 fracture was present in 18 of the patients who were operated on due to trauma. C1-2 dislocation was present in 9 of the patients. The surgical technique of the operated patients was the Goel-Harms technique in 30 patients, C1 sublaminar C2 spinous strapping in 2 patients, the Magerl technique in 5 patients, and the Ann technique in 9 patients. No additional neurological deficits and neurovascular injuries were encountered in patients. October 2019. Wound site discharge and infections developed in 5 of the patients. CSF fistula complication was observed in one patient. Revision surgery was required in 2 of the patients.

**Conclusion:** The chances of success are high when the operation is performed by planning fusion surgery in the craniovertebral junction and upper cervical region specific to the patient

**Keywords:** Posterior cervical fixation techniques



## S-016

### THE EFFECT OF POSTERIOR SPINAL FUSION ON SPINAL SAGITAL AND SPINOPELVIC PARAMETERS IN SCHEUERMANN KYPHOSIS WITH DIFFERENT CURVE PATTERN

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**Aim:** Preoperative and postoperative sagittal spinal and spinopelvic parameters changes were analyzed in patients with thoracolumbar and thoracic Scheuermann kyphosis (SK).

**Method:** Forty-two patients (18 women, 24 men) who underwent surgery with the diagnosis of SK were included in the study. Follow-up time, length of fusion level, and the apex of the kyphotic curve were noted. The patients were divided into two groups as thoracic SK (TSK group, apex T6-T9, n=24) and thoracolumbar SK (TLSK group, apex T10-T12, n=18). Preoperative and postoperative pelvic state, global kyphosis(GK), pelvic incidence(PI), pelvic tilt(PT), sacral slope(SS), lumbar lordosis(LL), PI-LL, thoracic kyphosis(TK), thoracolumbar kyphosis(TLK), T1-spinopelvic inclination (T1-SPI), T9-spinopelvic inclination (T9-SPI) cervical lordosis (CL) and sagittal vertical axis (SVA) values were measured using SURGIMAP© Software (Nemaris Inc. USA).

**Results:** The follow-up period was 5.19±3.14 years. There was no statistically significant difference between the groups in terms of gender, age, follow-up time, length of fusion level and global kyphosis. In the TLSK group, preoperative PI was statistically significantly lower (p=0.035), but there was no significant postoperative difference (p>0.05). While preoperative SS was statistically significantly lower in the TLSK group (p=0.045), there was no significant postoperative difference (p>0.05). While LL decreased statistically in both groups (p<0.001), no difference was found between the preoperative and postoperative groups. TK was significantly decreased postoperatively in both groups (p<0.001). In addition, thoracic kyphosis was significantly higher in the preoperative TLSK group, but there was no significant postoperative difference. While there was no statistically significant difference between the two groups in terms of CL (p>0.05), it was found to be significantly higher in the postoperative TSK group (p=0.042).



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Comparison results of the clinical characteristics

		Total (n=42)	TLSK (n=18)	TSK (n=24)	<sup>2</sup> p	<sup>3</sup> p
PI	Pre-op	41,83±10,46	37,94±10,73	44,75±9,45	0,035	0,183
	Final Follow-up	45±12,6	43,89±13,72	45,83±11,93	0,627	
	<sup>1</sup> p	0,045	0,031	0,558		
PT	Pre-op	11,4±9,36	11,94±10,89	11±8,26	0,761	0,698
	Final Follow-up	13,14±8,75	13,72±8,51	12,71±9,08	0,715	
	<sup>1</sup> p	0,210	0,507	0,212		
SS	Pre-op	29,48±10,13	25,89±7,83	32,17±10,95	0,045	0,097
	Final Follow-up	31,93±10,34	30,22±12,27	33,21±8,68	0,361	
	<sup>1</sup> p	0,120	0,025	0,661		
LL	Pre-op	-66,83±13,06	-63,11±14,39	-69,63±11,48	0,111	0,477
	Final Follow-up	-51,02±13,17	-51,78±13,04	-50,46±13,52	0,752	
	<sup>1</sup> p	<0,001	0,003	<0,001		
PI-LL	Pre-op	-23,88±15,03	-24,44±18,68	-23,46±12	0,846	0,590
	Final Follow-up	-6,45±11,98	-8,17±11,58	-5,17±12,36	0,429	
	<sup>1</sup> p	<0,001	0,001	<0,001		
TLK	Pre-op	31,95±17,53	44,89±12,63	22,25±14,17	<0,001	<0,001
	Final Follow-up	10,71±10,57	12,39±10,68	9,46±10,54	0,381	
	<sup>1</sup> p	<0,001	<0,001	<0,001		
TK	Pre-op	57,43±11,63	62,78±11,51	53,42±10,19	0,008	0,024
	Final Follow-up	31,64±9,28	32,83±7,59	30,75±10,44	0,458	
	<sup>1</sup> p	<0,001	<0,001	<0,001		
T9 SPI	Pre-op	-17,43±4,53	-18,44±4,55	-16,67±4,45	0,212	0,282
	Final Follow-up	-13,31±4,5	-13,72±4,53	-13±4,55	0,613	
	<sup>1</sup> p	<0,001	0,004	0,001		
CL	Pre-op	-24,55±18,79	-22±17,4	-26,46±19,92	0,453	0,087
	Final Follow-up	-18,79±19,44	-11,78±16,86	-24,04±19,91	0,042	
	<sup>1</sup> p	0,095	0,077	0,575		
SVA	Pre-op	-23,57±44,54	-5,83±46,93	-36,87±38,44	0,023	0,282
	Final Follow-up	-27,17±40,28	-32±32,74	-23,54±45,48	0,507	
	<sup>1</sup> p	0,661	0,047	0,185		
T1 SPI	Pre-op	-7,02±4,09	-5,56±4,03	-8,12±3,86	0,043	0,244
	Final Follow-up	-7,33±3,4	-7,67±3,33	-7,08±3,51	0,589	
	<sup>1</sup> p	0,703	0,129	0,277		



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Pelvic State	Pre-op	Normal	28 (66,7)	10 (55,6)	18 (75)	0,368	-
		Antreverted	7 (16,7)	3 (16,7)	4 (16,7)		
		Retroverted	7 (16,7)	5 (27,8)	2 (8,3)		
	Final Follow-up	Normal	35 (83,3)	14 (77,8)	21 (87,5)	0,469	
		Antreverted	3 (7,1)	1 (5,6)	2 (8,3)		
		Retroverted	4 (9,5)	3 (16,7)	1 (4,2)		

**Conclusion:** Preoperative and postoperative sagittal spinal parameter changes of the patients were similar in both groups. Sacral slope and pelvic incidence increased with posterior spinal fusion in patients with TLSK. We believe that this situation will increase the ability of patients to compensate for sagittal spinal alignment in advanced ages.

**Keywords:** Scheuermann kyphosis, Curve patterns, Sagittal profile, Pelvic incidence



S-017

**EFFECT OF DISTAL FUSION LEVEL ON SAGITTAL SPINAL AND SPINOPELVIC PARAMETERS IN LENKE 5 ADOLESCENT IDIOPATHIC SCOLIOSIS**

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**Aim:** The aim of this study was to evaluate the effect of preoperative and postoperative spinopelvic parameters and the lowest instrumented vertebra (LIV) on sagittal parameters in patients with Lenke 5 Adolescent Idiopathic Scoliosis (AIS).

**Method:** A total of 50 patients (43 female, 7 male) were included in the study. The follow-up period of the patients, the level of fusion, the length of fused vertebrae, and the apex of the curve in the coronal plane were noted. The patients were divided into three groups LIV level L3, L4, and L5. Groups were pre- and postoperative coronal balance, cobb angle, pelvic incidence(PI), pelvic tilt(PT), sacral slope(SS), lumbar lordosis(LL), PI-LL, thoracic kyphosis(TK), thoracolumbar kyphosis(TLK), T1-spinopelvic inclination(T1-SPI), cervical lordosis(CL), C2 slope, sagittal vertical axis(SVA) and cervical SVA(cSVA) values SURGIMAP© Software (Nemaris Inc. USA) ) was measured using

**Results:** The mean follow-up period of the patients was 6±3.18 years. No statistically significant difference was observed in terms of gender, age, follow-up time, and length of fusion level. The patients' coronal balance and coronal cobb angle decreased statistically significantly (p<0.001)). In total, while the PI value of the cases did not change statistically (p>0.05), it was observed that PT increased (p=0.049) and SS decreased (p=0.017). A statistically significant decrease in LL (p=0.017), decrease in TLK (p<0.001), and increase in CL (p=0.007) were observed in the sagittal alignment. The decrease in the SS value was statistically significant in both L4 and L5 groups compared to the L3 group (p=0.003). The PI value of the L5 group was statistically higher than both the L3 and L4 groups postoperatively (p<0.001). While there was no significant preoperative and postoperative change in the SVA value within the groups, the alignment was closer to neutral in the L5 group compared to the other groups. While a higher rate of the postoperative retroverted hip was observed in the L5 group (27.3%), this rate was less in the L4 group (22.2%). No postoperative retroverted hip was observed in the L3 group.



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Comparison results of the clinical characteristics

		Total (n=50)	L3 (n=12)	L4 (n=27)	L5 (n=11)	<sup>2</sup> p	<sup>3</sup> p
Coro- nal ba- lance (mm)	Pre-op	20,18±11,45	17,42±9,25	21,63±11,39	19,64±14	0,570	0,679
	Final Fol- low-up	11,2±5,74	11,75±7,07	11,48±5,04	9,91±6,17	0,703	
	<sup>1</sup> p	<0,001	0,081	<0,001	0,023		
Cobb angle	Pre-op	42,18±8,79	39,17±10,06	42,07±8,7	45,73±6,74	0,204	0,455
	Final Fol- low-up	13,44±8,19	13,42±7,61	13,11±8,25	14,27±9,35	0,927	
	<sup>1</sup> p	<0,001	<0,001	<0,001	<0,001		
PI	Pre-op	47,94±11,41	50,25±7,84	42,7±10,92	58,27±7,91	<0,001 <sup>c</sup>	<0,001 <sup>c</sup>
	Final Fol- low-up	46,94±11,91	47,58±7,29	41,96±11,41	58,45±9,18	<0,001 <sup>b,c</sup>	
	<sup>1</sup> p	0,298	0,167	0,554	0,942		
PT	Pre-op	9,94±7,68	10,08±5,81	7,85±8,09	14,91±6,53	0,033 <sup>c</sup>	0,003 <sup>b,c</sup>
	Final Fol- low-up	12,02±10,05	9,75±5,05	9,3±9,69	21,18±10,2	0,002 <sup>b,c</sup>	
	<sup>1</sup> p	0,049	0,857	0,255	0,044		
SS	Pre-op	37,8±7,2	39,58±5,23	34,67±7,35	43,55±4,13	0,001 <sup>c</sup>	0,003 <sup>a,c</sup>
	Final Fol- low-up	34,94±8,13	38±6,32	32,59±9,37	37,36±4,32	0,083	
	<sup>1</sup> p	0,017	0,275	0,263	0,019		
PI-LL	Pre-op	-11,84±12,66	-12,92±8,38	-15,56±13,05	-1,55±10,49	0,006 <sup>c</sup>	0,001 <sup>b,c</sup>
	Final Fol- low-up	-8,66±16,34	-10,42±9,58	-14±14,73	6,36±17,73	0,001 <sup>b,c</sup>	
	<sup>1</sup> p	0,045	0,296	0,457	0,083		
LL	Pre-op	-59,5±8,67	-62,42±9,24	-58,26±8,93	-59,36±7,26	0,392	0,447
	Final Fol- low-up	-55,62±11,66	-58±7,85	-55,93±13,09	-52,27±11,55	0,500	
	<sup>1</sup> p	0,017	0,026	0,321	0,104		
TLK	Pre-op	12,9±13,97	4,67±10,2	17,93±15,41	9,55±7,9	0,013 <sup>a</sup>	0,023 <sup>a</sup>
	Final Fol- low-up	3,5±10,32	0±7,6	5,96±11,03	1,27±10,29	0,182	
	<sup>1</sup> p	<0,001	0,093	<0,001	0,042		
TK	Pre-op	29,2±11,62	26,83±11,28	31,63±11,28	25,82±12,46	0,276	0,114
	Final Fol- low-up	26,94±9,55	23,5±10,22	29,56±8,34	24,27±10,52	0,107	
	<sup>1</sup> p	0,128	0,190	0,364	0,605		



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**S-017**

T1 SPI	Pre-op		-7,58±4,06	-8,5±4,62	-7,85±3,75	-5,91±4,04	0,277	0,066
	Final Follow-up		-7,24±3,53	-7,42±3,29	-8±3,03	-5,18±4,35	0,078	
	<sup>1</sup> p		0,603	0,456	0,865	0,633		
CL	Pre-op		-1,5±15,51	-2,5±15,02	-1,41±14,81	-0,64±18,92	0,960	0,637
	Final Follow-up		-7,3±15,06	-0,25±13,16	-10,3±15,39	-7,64±14,83	0,158	
	<sup>1</sup> p		0,007	0,416	0,014	0,009		
C2 SLOPE	Pre-op		18,34±11,05	16,58±12,38	18,56±10,98	19,73±10,53	0,791	0,821
	Final Follow-up		18,08±8,2	18,58±9,11	17,26±6,9	19,55±10,5	0,725	
	<sup>1</sup> p		0,847	0,385	0,502	0,955		
SVA	Pre-op		-32,66±39,42	-46,5±32,62	-39,11±36,92	-1,73±38,82	0,009 <sup>b,c</sup>	0,001 <sup>b,c</sup>
	Final Follow-up		-25,82±37,51	-35,25±24,33	-34,74±31,89	6,36±46,23	0,004 <sup>b,c</sup>	
	<sup>1</sup> p		0,192	0,160	0,527	0,604		
cSVA	Pre-op		25,54±10,08	25,17±10,97	24,44±10,49	28,64±8,08	0,513	0,503
	Final Follow-up		23,04±9,75	22,33±6,76	22,48±11,27	25,18±8,85	0,719	
	<sup>1</sup> p		0,108	0,311	0,374	0,365		
Pelvic State	Pre-op	Normal	37 (74)	9 (75)	18 (66,7)	10 (90,9)	0,704	-
		Antre-verted	12 (24)	3 (25)	8 (29,6)	1 (9,1)		
		Retro-verted	1 (2)	0 (0)	1 (3,7)	0 (0)		
	Final Fol-low-up	Normal	32 (64)	10 (83,3)	14 (51,9)	8 (72,7)	0,119	
		Antre-verted	9 (18)	2 (16,7)	7 (25,9)	0 (0)		
		Retro-verted	9 (18)	0 (0)	6 (22,2)	3 (27,3)		

**Conclusion:** As the distal end vertebra involved in the coronal plane curvature of scoliosis proceeds distally, the PI value increases in patients with Lenke 5 scoliosis. In addition, as the LIV descends distally, the SS decreases further, forming a retroverted pelvis.

**Keywords:** Lenke 5, Sagittal, Scoliosis, Spinopelvic.



## S-018

### DOES IMPLANT RELATED COMPLICATIONS INTERFERE WITH CORRECTION IN THE SHILLA TECHNIQUE PERFORMED TO TREAT EARLY ONSET SCOLIOSIS?

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<sup>2</sup>Fatih Sultan Mehmet Eğitim ve Araştırma Hastanesi

**Aim:** In early-onset scoliosis (EOS), when surgical treatment is required, the Shilla technique, one of the growth-preserving instrumentation methods, has a corrective effect on the deformity, while reducing the need for surgical treatment with its growth-directing effect. As with other techniques, various problems may be encountered as a result of Shilla application. In our study, it was aimed to understand the consequences of complications encountered with the Shilla method on correction and growth.

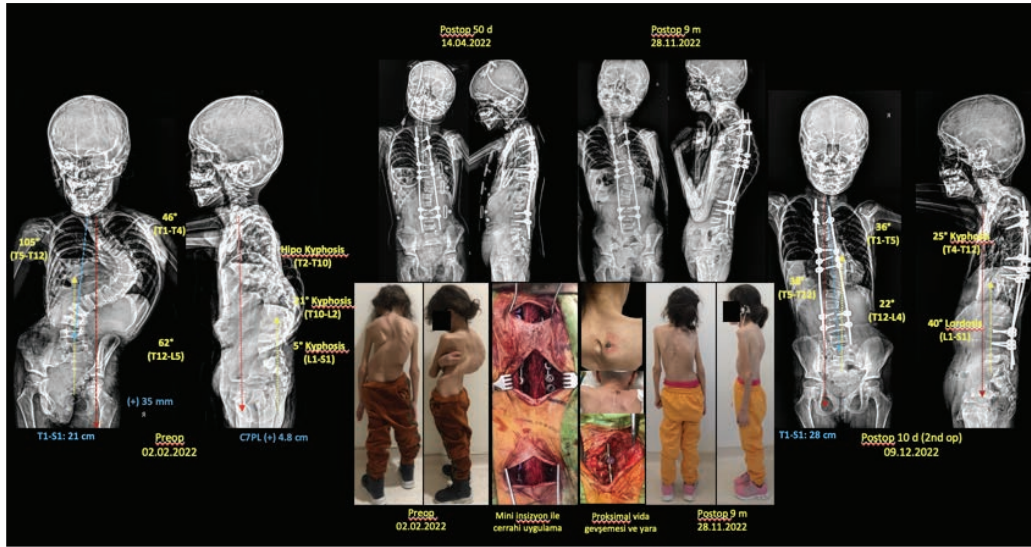
**Method:** Sixteen patients with a follow-up period of at least 1 year ( $30.8 \pm 29.2$ , 12-104 months) were included in the study. Three (18.8%) of the cases graduated with fusion as a result of the lengthening treatment, while the others continued their treatment. Cobb angles, spine heights, kyphosis and lordosis angles, coronal and sagittal balance, pelvis and shoulder balance, quality of life scores (EOSQ-24) results were measured at preop, early postoperative and final follow-up. The effects of deformity correction, T1-S1 and T1-T12 lengths, implant-related complications and unplanned surgeries on treatment were retrospectively analyzed. The results of patients with and without complications were compared.

**Results:** In the early postoperative and final controls, Cobb angle and shoulder balance improved, and T1-T12 and T1-S1 heights increased compared to preoperative measurements ( $p < 0.05$ ). Kyphosis, lordosis, coronal, sagittal and pelvic balance did not change significantly according to preop measurements ( $p > 0.05$ ). No complications were observed in 50% of the cases during the treatment. Unplanned surgery was required in 6 (37.5%) of the other 8 cases (50%) with postoperative implant-related complications (Figure 1). Implant failure in the proximal region in 5 cases (31.25%) and deep tissue infection around the implant in 1 case (6.25%). Unplanned surgery was performed 10 times in 6 patients. No additional surgery was required in 2 cases with rod fractures. There were no significant differences in the preoperative, early postoperative, and final follow-up Cobb angle, T1-T12 and T1-S1 lengths in the group with and without complications ( $p > 0.05$ ). However, it was observed that T1-S1 length and lordosis could be affected in patients with complications compared to uneventful patients. Improvement was observed in all components of the EOSQ-24 score.



S-018

Figure 1



A 6-year-old girl with Syndromic (Marfan) kyphoscoliosis. With minimal surgical incision approach was performed with the Shilla technique. Due to postoperative respiratory distress, pediatric intensive care treatment was required. In the 9th month postoperatively, a revision was performed on the proximal region due to proximal screw loosening and skin penetration of the rod tip.

**Conclusion:** Significant improvement in deformity correction, spine length and quality of life scores in EOS was achieved with Shilla treatment. Although Shilla treatment and implant-related complications and related unplanned surgeries were required in our cases, it was determined that the complications encountered did not have a significant negative effect on the correction and spine growth.

**Keywords:** Early-onset scoliosis, Shilla technique, growth orientation, implant complication, quality of life scores



S-019

## RESULTS OF SURGICAL TREATMENT IN UPPER CERVICAL VERTEBRA INJURY AFTER TRAUMA

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**Aim:** Occipital condyles, atlas and axis form the upper cervical spine region. Trauma to the upper cervical spine, which provides most of the mobility of the neck, can result in a variety of injuries ranging from simple soft tissue disorders to fatal fractures with impaired spinal stability. The purpose of this article was to evaluate the surgical procedures used in our hospital to treat patients with trauma to the upper cervical spine.

**Method:** The study included 32 patients who underwent surgery for posttraumatic injuries of the upper cervical spine between 2014 and 2023. The study excluded pathologic fractures due to malignant or rheumatic diseases. All patients included in the study were evaluated retrospectively.

**Results:** In the study of 12 female and 20 male patients with upper cervical trauma, the mean age was 53 years. Anderson D'Alonzo type 2 odontoid fractures were most common, followed by atlas fractures. Neurologic examinations revealed monoparesis in one patient, hemiparesis in one patient, quadriparesis in one patient, and unilateral cranial nerve 12 palsy in one patient. Four patients had major fractures and two patients had intracranial hemorrhages that did not require neurosurgical intervention. One patient underwent anterior cervical odontoid fixation. All other patients received posterior segmental stabilization (PSS). 6 patients received occipitocervical stabilization, and 4 patients received C1-C3 PSS. Three of the remaining patients received a three-level PSS and two of them received a four-level PSS. (Table 1) One patient received stabilization with a C1 lateral arch and a C2 laminar hook. During postoperative follow-up, surgical site infection was found in 2 patients and meningitis in 2 patients. During postoperative follow-up, surgical site infection and meningitis were noted in 2 patients. Revision surgery was performed in 2 patients because of instrument failure. During postoperative follow-up, death due to other trauma-related pathologies occurred in two cases. Twenty-six patients with normal postoperative neurologic examination were discharged. A patient whose intensive care was prolonged because of systemic complications developed severe disability because of non neurological pathologies. Three patients developed permanent muscle weakness postoperatively.



**S-019**

Table 1

Diagnosis (n=32)	Surgical Procedure (n= Number of Patients)
Type II OF (n=9)	<ul style="list-style-type: none"> <li>-PSS with C1 lateral mass and C2 pedicle screw (n=3)</li> <li>-PSS with C1 lateral mass and C2 laminar screw (n=2)</li> <li>-PSS wit C1 and C2 lateral mass screw (n=1)</li> <li>-PSS with C1, C2 laminar screw and spinous process wiring (n=1)</li> <li>-Anterior odontoid fixation (n=1)</li> <li>-PSS with C1 posterior arcus and C2 lamina hook (n=1)</li> </ul>
Type III OF (n=1)	-PSS with C1 and C3 lateral mass screw(n=1)
Hangman Fracture (n=1)	-PSS with C1 and C3 lateral mass screw(n=1)
Bilateral C2 Pedicle Frac- ture (n=2)	-PSS with bilateral C2 pedicle screw(n=2)
Type II OF + C1-2 Dislo- cation (n=2)	<ul style="list-style-type: none"> <li>-PSS with C1 lateral mass and C2 pedicle screw(n=1)</li> <li>-PSS with C1 and C3 lateral mass screw(n=1)</li> </ul>
Type II OF + C2-3 Dislo- cation (n=1)	-Occipital plate and C1-5 occipitocervical stabilization(n=1)



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Type II OF + C1 Fracture (n=9)	<ul style="list-style-type: none"> <li>-PSS with C1 and C2 lateral mass screw(n=1)</li> <li>-Occipitocervical stabilization with C2 lateral mass and occipital plate screw(n=1)</li> <li>-PSS with C1 lateral mass and C2 laminar screw(n=2)</li> <li>-PSS with C1 lateral mass, C2 laminar and C3 lateral mass screw(n=1)</li> <li>-PSS with C1, C3,C4 LM and C2 pedicle screw(n=1)</li> <li>-PSS with C1, C3 and C4 LM screw(n=1)</li> <li>-OCS with occipital plate, C2 pedicle and C3 LM screw(n=1)</li> <li>-OCS with occipital plate, C2 pedicle, right C3 LM and left C4 LM screw(n=1)</li> </ul>
Occipital Condyle Fracture (n=1)	-OCS with occipital plate, C1 LM and C2 pedicle screw(n=1)
Jefferson Type I + Hangman Fracture (n=1)	-PSS with C1 and C3 LM screw(n=1)
Jefferson Type III + AOD (n=1)	-PSS with C1 and C3 LM screw(n=1)
Hangman + C3 Corpus Fracture (n=1)	-PSS with C1, C3 and C4 LM screw(n=1)
Jefferson Type II Fracture (n=1)	-OCS with occipital plate and C2 pedicle screw(n=1)
Type III OF + C1-2 Dislocation (n=2)	<ul style="list-style-type: none"> <li>-OCS with occipital plate, C2 pedicle, C1 and C3 LM screw(n=1)</li> <li>-PSS with C2 pedicle, right C1 laminar and right C1 LM screw (n=1)</li> </ul>

AOD: Atlantooccipital dislocation, OCS: Occipitocervical stabilisation, PSS: Posterior cervical stabilisation, OF: Odontoid fracture

**Conclusion:** Fractures of the upper cervical spine can be treated with either noninvasive or invasive procedures. Collar braces and motion-restricting orthoses are examples of conservative treatments. Surgical treatment consists of a translaminar transpedicular occipital plate, PSS with a lateral mass screw, and an anterior odontoid screw fixation. The fracture type can be determined using CT. MRI, which provides information about ligamentous damage, is decisive in terms of surgical intervention.

**Keywords:** Upper Cervical, Trauma, Stabilisation



S-020

**EVALUATION TO EARLY TERM SAGITTAL BALANCE PARAMETERS IN PATIENTS WITH DEGENERATIVE LUMBAR STENOSIS SURGERY THAT BILATERAL DECOMPRESSION VIA UNILATERAL APPROACH**

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**Aim:** In elder age group, lumbar spondylosis may be seen as a process of aging with slight symptoms or no symptoms. But, in some individuals, it may be a serious geriatric problem with heavy symptoms. When this disease, known as lumbar spinal stenosis (LSS) causes severe pain and disability surgical treatment may be necessary. Surgical treatment of LSS is based on decompression. Surgical techniques include wide laminectomy and minimally invasive techniques such as bilateral foraminotomy, laminoplasty and bilateral decompression by unilateral laminotomy. Although there are investigations showing superiority of minimally invasive techniques to laminectomy, minimally invasive techniques are not a standard surgical treatment yet. Although the importance of global sagittal balance is underscored recently, little is known about the changes in sagittal alignment after lumbar canal decompression. The aim of this study is to evaluate if bilateral decompression by unilateral laminotomy for surgical treatment of lumbar spinal stenosis is effective and safe or not, and evaluate to affect to early term spine biomechanics and sagittal balance parameters.

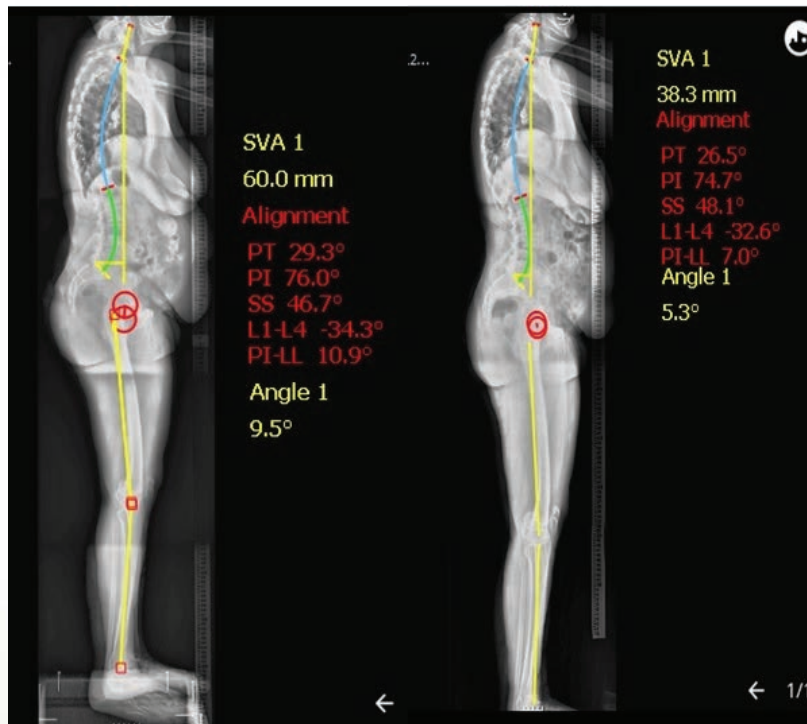
**Method:** 41 patients who underwent bilateral lumbar decompression with the unilateral approach and they were followed up prospectively for a period of 1 year from the date of surgery and sagittal balance parameters were measured by taking whole body radiographs of these patients. Measurements were analyzed and recorded with Surgimap. Patients were divided into 3 groups (<50 mm, ≥50 mm - <100 mm, ≥100 mm) according to their Sagittal Vertical Axis (SVA) values in preoperative measurements. The clinical parameters and sagittal balance parameters of the groups were compared as preoperative and postoperative.

**Results:** Significant improvements were observed in sagittal balance parameters in patients who underwent bilateral decompression with a unilateral approach in the lumbar spinal stenosis. SVA values decreased significantly from preop 66.5 mm to postop 35.3 mm. We observed that the lumbar lordosis angle increased significantly from preop 14° to postop 17°. Clinically, functional improvements were observed in these patients, with an increase in pain control and walking distance. In addition, improvements were observed in the compensation mechanisms along with the improvements observed in the sagittal alignment. Decreases were observed in pelvic tilt and knee flexion angles.



**S-020**

Measurements in preop and postop sagittal alignment



Preop SVA decreased from 60 mm to 38.3 mm. A decrease in pelvic tilt was observed. An increase in sacral slope was also observed. A decrease in knee flexion angle was detected.

**Conclusion:** Bilateral decompression surgery via unilateral approach, which is a minimally invasive approach, in patients with lumbar degenerative stenosis, leads to improvements in sagittal balance parameters and compensation mechanisms in these patients, and is an effective method that provides clinical improvement in these patients.

**Keywords:** Lumbar spinal stenosis, Unilateral laminotomy, Minimal invasive surgery, Sagittal balance



S-021

## IS MEDULLAR CANAL INVASION AS A PREDICTOR FOR POSTERIOR LIGAMENTOUS COMPLEX INJURY IN THORACOLUMBAR BURST FRACTURES?

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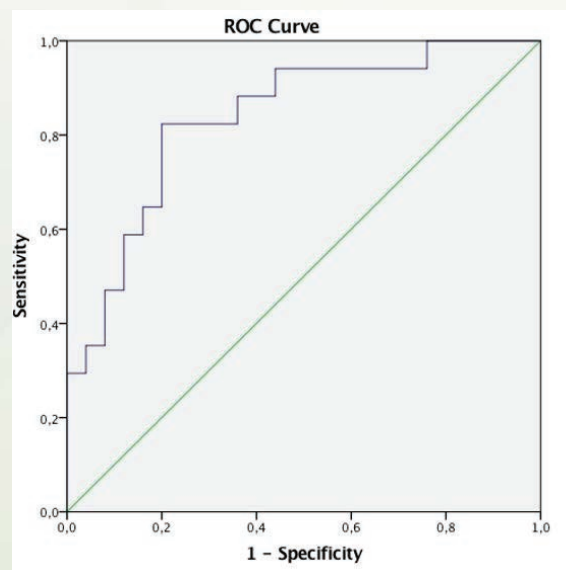
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**Aim:** The large part of spinal fractures occur in thoracolumbar zone and burst fractures constitute for 10%–20% of these injuries. Posterior ligamentous complex acts a major role in spinal stability and injury of this structure leads to spinal instability and neurological compromise. In this study, correlation of medullar canal invasion and posterior ligamentous injury were evaluated.

**Method:** A total of 58 patients with thoracolumbar fractures were retrospectively evaluated between January 2013 and December 2022. Exclusion criteria include fracture dislocation injuries(Ao type C) and pathological fractures. Computed tomography was performed to asses the medullar canal invasion and magnetic resonance imaging was performed to asses the posterior ligamentous complex injury. The compromise of the spinal canal defined as the ratio of the amount of the canal compromise to total spinal canal diameter at the cross-sectional area of injured level. 42 were calculated to evaluate relationships between amount of canal compromise and posterior ligamentous injury.

**Results:** 42 patients were included in the study. There were 25 males (59.5 %) and 17 females (40.5 %), and the average age was 38.2 (15.3) years. The mean follow-up time was 19.9 (21.9) months. (Table 1). Preoperative STIR-weighted MRI showed that 17 patients had posterior ligamentous injury. The results of ROC curve analysis indicate that medullar canal compromise rate greater than %27.99 is a predictive factor for posterior ligamentous injury. [area under the curve (AUC) 0.838; 95% CI 0.714-0.961;  $p < 0.001$ ; 82.4% sensitivity; 80% specificity].

Area under the curve based on ROC analysis assessments.



Area under the curve 0.838: good quality result



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Optimal cut-off value for the area under the curve and the percentage of preoperative canal invasion according to ROC analysis

AUC(95%)	cut off	p	sensitivity	specificity (%)
0.838(0.714-0.961)	27,9926	<0.001	82.4%	80%

Area under the curve 0.838: good quality result.

**Conclusion:** The results of our study indicate that medullar canal compromise percentage greater than 28% was associated with posterior ligamentous complex injury. Our data demonstrate that canal compromise rate measured with CT at the cross-sectional area of injured level is a reliable indicator for posterior ligamentous injury.

**Keywords:** thoracolumbar fracture, burst fracture, posterior ligamentous complex, ligament injury, medullar canal compromise



S-022

## COMPARISON OF THE CLINICAL AND RADIOLOGIC OUTCOMES OF PATIENTS WITH LENKE TYPE 5 AND 6 AIS TREATED SURGICALLY AND WITH L3 AND L4 AS THE LOWEST INSTRUMENTED VERTEBRAE

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**Aim:** Surgically correction of thoracolumbar and lumbar (TL/L) curves requires inclusion of the lumbar vertebrae in the fusion. However, the inclusion of the lumbar vertebrae in the fusion procedure may result in decreased lumbar motion, potentially negatively impacting patients' quality of life. The aim of the present study was to compare the clinical and radiological outcomes of AIS patients who underwent surgical treatment with L3 and L4 as the lowest instrumented vertebrae (LIV).

**Method:** Patients with Lenke type 5 and 6 AIS diagnosed between 2010 and 2020 in our institution, who underwent posterior instrumentation and fusion with a diagnosis of Lenke type 5 and 6 AIS with a follow-up of at least 24 months and whose LIV was L3 and L4 were included in the study. Patients were divided into 2 groups as L3 and L4 level. There were 21 patients (F: 18, M: 3) in the L3 group and 15 patients (F: 10, M: 5) in the L4 group. The study involved the evaluation of preoperative, early and final radiographs of the patients. Furthermore, the SRS-22 questionnaire was employed to assess the patients' quality of life and perception of deformity.

**Results:** The study had a mean follow-up period of  $32.4 \pm 8.7$  (24-52) months and the mean TL/L curvature in the coronal plane in the preoperative radiographs was  $56.0 \pm 10.0$  degrees in the L4 group and  $48.14 \pm 3.1$  degrees in the LIV L3 group, with a statistically significant difference ( $p < 0.001$ ). The TL/L curvatures of the patients in the L4 group were found to be larger than those in the L3 group. There was no significant difference observed between the two groups in postoperative radiologic values. The SRS-22 questionnaire revealed that there was no significant difference between the two groups in the pain and self-image/appearance domains. However, there was a significant difference in the function/activity, mental health, and satisfaction with treatment domains, with higher scores in the L3 group ( $p = 0.001$ ,  $0.025$  and  $0.046$ , respectively).

**Conclusion:** Our findings suggest that in surgical management of TL/L curvatures, surgeons should aim to avoid extending the fusion down to the L4 level to maintain the patients' quality of life. Nevertheless, in cases where the TL/L curves are larger and more rigid, extending the LIV level to include the L4 vertebrae is necessary to achieve optimal correction.

**Keywords:** Adolescent Idiopathic Scoliosis, lowest instrumented vertebra, thoracolumbar curve, lumbar curve



S-023

## **DIGITIZED RADIOGRAPHS OUTPERFORM RADIOGRAPHIC MEASUREMENTS IN PREDICTING MECHANICAL COMPLICATIONS AFTER ADULT SPINAL DEFORMITY SURGERY**

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**Aim:** Spinopelvic sagittal radiographic measurements have been shown to among key factors affecting mechanical failures following adult spinal deformity surgery. Applying artificial intelligence (AI) to clean digital data files has improved predictive abilities in different fields of medicine. We hypothesized that digitized radiographic images would predict postoperative mechanical complications better than do radiographic measurements.

**Method:** A retrospective analysis was performed on a data collected prospectively in a multi-center adult spinal deformity database. We compared the ability of the GAP score (sagittal spinopelvic measurements + age factor) and lateral spine radiographs digitized with vertebral reference points + age factor, to predict postoperative mechanical complications. Surgical patients with more than 2 years of follow-up who had  $\geq 4$  fused segments and full-spine standing preoperative and 6 weeks postoperative radiographs were included. Logistic regression models were used to assess the predictive abilities of GAP Score VS digitized radiographs. Models based on digitized radiographs (Lateral views) used vertebral image coordinates obtained with KEOPS software and machine learning gradient boosting (Catboost) algorithm. In digitized radiograph models, patients were labelled as older or younger than 60 years, as this feature contributes to the GAP score. Three models were created based on preoperative, 6 weeks postoperative, and both data for each method (GAP Score and digitized radiographs). Model diagnostic performance was compared using the area under the receiver operating characteristics curve (ROC-AUC), Youden index, sensitivity and specificity.

**Results:** 434 patients (359F, 75M) met the inclusion criteria. The mean age at surgery was 55 years. The mean follow-up duration was 3.2 years (range 2 to 7 years). A mean of 9.9 levels were fused. 98 patients (22.6%) of the patients underwent a 3-column osteotomy. 154 patients (35.5%) experienced a mechanical complication during the course of the follow-up. Under equivalent conditions, the predictive performance was higher ( $p < 0.05$ ) for digitized radiograph models than for the GAP models (mean AUC-ROCs 0.71 [0.77-0.65] and 0.64 [0.70-0.56]),



## S-023

respectively). Digitized radiograph models resulted in a 3 to 8-fold increase in the sensitivity to predict mechanical complications compared with the GAP score, but with a reduced specificity (27.5% vs 35%) (Fig 1).

Model Comparison

		GAP Score		Digitized Radiographs + Age Factor		P-value
		Mean	SD	Mean	SD	
PRE	AUC-ROC	0.67	0.05	0.71	0.06	0.028
	Sensitivity	0.22	0.10	0.69	0.11	<0.001
	Specificity	0.89	0.07	0.61	0.06	<0.001
	Youden Index	1.14	0.08	1.33	0.11	<0.001
6w POST	AUC-ROC	0.59	0.05	0.71	0.06	<0.001
	Sensitivity	0.08	0.04	0.64	0.10	<0.001
	Specificity	0.97	0.04	0.63	0.09	<0.001
	Youden Index	1.05	0.05	1.32	0.11	<0.001
PRE and 6w POST	AUC-ROC	0.66	0.05	0.71	0.06	<0.01
	Sensitivity	0.22	0.08	0.67	0.11	<0.001
	Specificity	0.87	0.05	0.63	0.07	<0.001
	Youden Index	1.10	0.10	1.34	0.11	<0.001

SD: Standard deviation

**Conclusion:** Digitized radiographs predict mechanical complications better than do radiographic measurements and scoring systems. Models based on digital information in combination with artificial intelligence may reduce workload and manpower needs, offering a more accurate and individualized alternative to predict outcomes in adult spinal deformity surgery.

**Keywords:** adult spinal deformity, GAP score, mechanical complications, artificial intelligence, digitized radiographs



**S-024**

**EVALUTION OF PERCUTANE POSTEIOR FACET FUSION THECNIQUE WITH ANTERIOR CERVICAL SURGERY RELATIONSHIP**

Şahin Kırmızıgöz<sup>1</sup>, Halit Şensoy<sup>1</sup>

<sup>1</sup>Gaziantep Dr Ersin Arslan Training and Research Hospital

**Aim:** Foraminal stenosis caused by cervical intervertebral disc degeneration or cervical spondylosis is a common cervical pathology. In patients with foraminal stenosis, fixing with the posterior lateral Mass screw method after cervical posterior decompression and facet fusion method with percutaneous posterior cage are used. The facet fusion method with a percutaneous posterior cage has advantages such as less intraoperative blood and tissue loss, healing times, and hospitalization periods. We examined the results of patients with percutaneous posterior cages depending on the anterior cervical surgical history.

**Method:** The data of the patients with facet fusion method with percutaneous posterior cage due to foraminal stenosis are given in the Table. We have previously evaluated patients in two groups according to the presence of anterior cervical surgery history due to cervical disc disease. After the patient is taken into prone positions, the entrance location is determined as 5 cm below the planned level and 2 cm lateral of the midline. Under fluoroscopy, titanium Cage that will distraction is placed by reaching the facet joint range with guidance.

The patients are applied facet fusion with percutaneous posterior cage methods





## S-024

In facet fusion with percutaneous posterior cage methods, we showed; A surgery planning, B guide entry, C lateral scope appearance of guide, and D the stages of confirming the cage after the application.

The patients are applied facet fusion with percutaneous posterior cage methods

Patients	With Surgical History	Without Surgical History	Total
Male	5	14	19
Female	15	9	24
Single level	16	10	26
Dual level	4	13	17
Average Age (Year)	37	68	59
VAS reduction (%)	57	83	72
Preoperative use of multiple analgesic drugs	20	23	43
Postoperative use of multiple analgesic drugs	8	5	13

We showed the patients are applied facet fusion with percutaneous posterior cage methods

**Results:** In our neurosurgery clinic, we have applied facet fusion with the percutaneous posterior cage method to 43 patients with foraminal stenosis. We applied bilaterally this method to these patients at single or dual levels. 20 patients had anterior cervical surgical history. The patients without cervical surgical history were older than patients with a cervical surgical history. This method was usually applied single level to patients with a cervical surgical history. The gender of patients with cervical surgical history was mostly female. Preoperative and in the first month of postoperative, we made pain assessments in patients with VAS. We accepted as targets of treatment the reduction of the VAS by more than 50 % and the elimination of using regular analgesic drugs.

**Conclusion:** According to patients with anterior cervical surgery, we found that the facet fusion with the percutaneous posterior cage method is more effective in patients without a surgical history.

**Keywords:** Distractor Implant, facet fusion, percutaneous posterior cage, cervical foraminal stenosis, anterior cervical surgery



S-025

## RETROSPECTIVE EVALUATION OF 15 SPINAL INFECTION CASES WHO UNDERWENT SURGICAL TREATMENT IN OUR CLINIC

Ömer Akar<sup>1</sup>, Murat Korkmaz<sup>1</sup>

<sup>1</sup>Çiğli Education and Research Hospital

**Aim:** Infections after spinal surgery may be related to the nature of the spinal pathology and the surgical procedure, as well as the systemic health problems of the patient. The most common cause is Staph. aureus. Among primary spinal bacterial infections, pyogenic agents, Brucella and Mycobacterium tuberculosis are the first to come to mind. Spinal involvement accounts for 50% of skeletal involvement in tuberculosis. Lumbar region involvement is most common after thoracic region. Pyogenic spondylodiscitis is most common in the lumbar region. The localization of the infection is typically the result of arterial septic embolism. The origin is the metaphyseal region anterior to the vertebra. Spread over time is located to the intervertebral disc space and adjacent vertebrae. The agent is unimicrobial. In many studies, staph. aureus is the most common cause and male diabetic patients constitute the majority of the cases.

**Method:** Between 2018 and 2023, patients who used implants and underwent only discectomy and patients who presented with primary spinal infections were examined.

**Results:** The number of cases with iatrogenic infection was nine. The number of cases presenting with primary spinal infection is five. Staph aureus is the most common cause of infections after spinal surgery. Total primary tbc spondylodiscitis case is three, primary spondylodiscitis case due to Brucella agents is two. No causative agent was found in one patient who underwent surgical treatment for primary spinal infection. Meningitis developed without dural injury in one patient who underwent surgical treatment and antibiotic therapy for tuberculous spondylodiscitis. Mortality due to infection after spinal surgery was observed in one case.

**Conclusion:** The use of antibiotics is the main treatment approach. If there is a neurological finding, surgical treatment can be planned in the presence of deformity or instability. The most important markers for recovery are pain and, if present, improvement in body temperature elevation. Reduction in leukocytosis and erythrocyte sedimentation rate, which are laboratory markers, is important in the follow-up of recovery. Persistent leukocytosis and high sedimentation rate values at 4 weeks or a subsequent increase in these values should suggest failure in treatment. Relapse is important and can be seen in approximately one third of the cases in the literature. Mortality is about 6%.

**Keywords:** Spinal infections, Spinal surgery, Pyogenic, Tuberculosis, Brucella



**S-026**

## EFFECTS OF VERTEBRAL FRACTURES AND THEIR FEATURES ON INTERVERTEBRAL DISC DEGENERATION

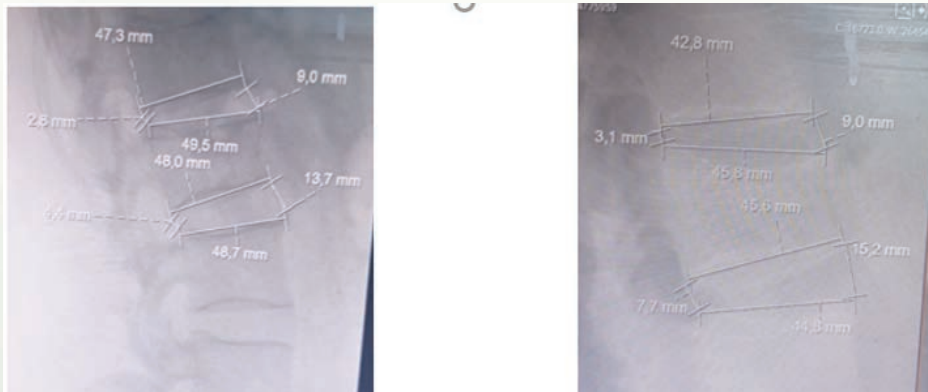
Alaa Mukat<sup>1</sup>, Can Koşay<sup>1</sup>

<sup>1</sup>DEU ortopedi ve travmatoloji

**Aim:** The aim of this study was to investigate the development of disc degeneration and the factors affecting it in patients who sustained thoracolumbar vertebrae fractures.

**Method:** 91 patients (51 female, 40 male - mean age of patients 58.6 years) who were admitted with thoracolumbar vertebrae fractures between the years 2006 and 2017 were included. The follow-up period of the patients was between 2 and 15 years (mean 4.6 years). 109 vertebrae in total were studied: 60 (60.55%) were AO type A1, and the remaining fractures consisted of AO type A2, A3, A4, B1, and B2. Information regarding patient age at the time of fracture (groups: <30y, 30-60y, >60y), gender, high or low energy trauma preceding the fracture, treatment method, and time from initial fracture to final follow-up (groups: 2-3 years, 4-5 years, >5 years) was gathered from patient files. Fracture level, AO fracture type, endplate fracture characteristics, classification and amount of fragmentation, the sagittal index, and disc degeneration described by Akeda were assessed radiologically by an orthopaedic surgeon and Professor of Radiology twice, one month apart.

oner method for intervertebral disc degeneration



**Results:** The disc degeneration rate after 5 years was 55.2 in cranial discs and 44.8 in caudal discs. As the follow-up period increased, especially after 5 years, the development of disc degenerations showed a significant statistical increase in adjacent cranial and caudal intervertebral discs. ( $p=0.012$ ,  $p=0.006$  respectively). Anatomical localization and amount of fragmentation of the endplates did not demonstrate statistically significant changes in disc degeneration. There was no statistically significant difference in the development of disc degeneration, depending on gender, age at the time of trauma, or treatment method. The level of the fracture, the AO type of fracture, and the type of trauma preceding the fracture were not correlated with the frequency of disc degeneration.



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distribution of disc height values

GRUP	-70 VE ALTI	-60	-50	-40	-30	-20	-10	-10 VE ÜST
SAYI	5	9	15	10	15	15	39	110
Yüzdesi	%2,29	%4,12	%6,88	%4,58	%6,88	%6,88	%17,88	%50,45

**Conclusion:** This study has shown us that the incidence of disc degeneration increases as follow-up periods increase. Moreover, after 5 years there is a statistically significant increase in the incidence of intervertebral degeneration, at 55.2%, which is a higher reported value than any other studies. It was also observed that disc degeneration is more common in cranial discs and in cases where there is gross endplate comminution.

**Keywords:** Intervertebral Disc Degeneration, endplate fracture, Vertebral Fractures, sagittal index, disc height index( $\Delta$ DHI).



S-027

## LONG-TERM OPIOID MEDICATION PROFILE OF EUROPEAN ADULT SPINAL DEFORMITY PATIENTS: MINIMUM FIVE YEARS FOLLOW-UP STUDY

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**Aim:** There remains significant variability in the use of postoperative opioids. On one end, it is proven that appropriate pain control is a critical aspect of patient management; on the other end, past few decades have been associated with major increases in opioid-related overdoses and addiction treatment. We hypothesized that several preoperative and postoperative risk factors affecting long-term opioid use could be identified. The aim was to evaluate the factors associated with minimum 5-year postoperative opioid use following adult spinal deformity surgery.

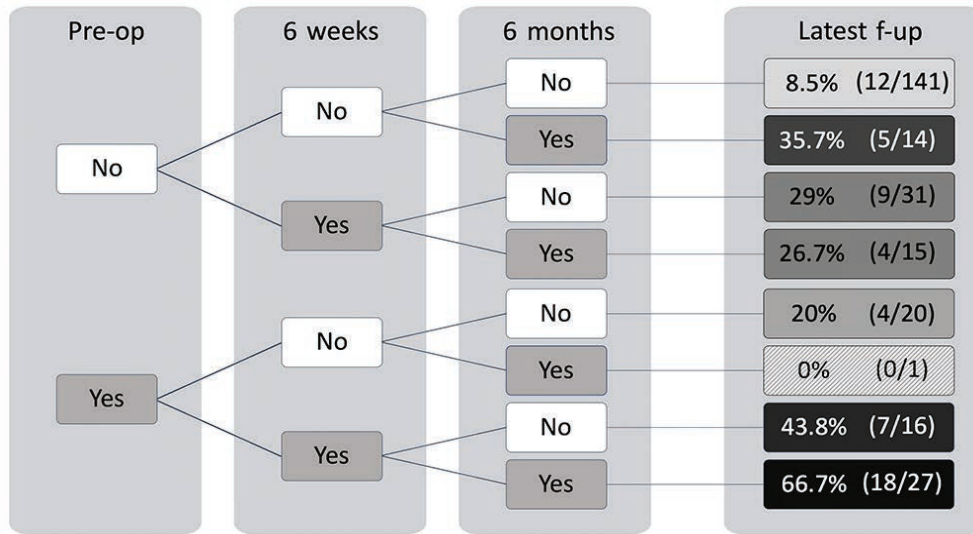
**Method:** A retrospective analysis of patients undergoing elective spinal deformity surgery between 2009 to 2016 was performed on a prospectively followed study group database. A total of 37 factors comprising patient characteristics (7 demographic and 6 medical history), radiographic measurements (5 preoperative and 5 postoperative), operative details (9 variables), opioid usage or otherwise preoperatively and at early postoperative visits (3 time points in total), and details of mechanical complications and revisions were analyzed. Variables were analyzed one by one using univariate tests. Then, to determine the independent risk factors, multiple binary logistic regression following was performed. Details on identified factors were provided.

**Results:** 265 patients (215F, 50M) from five sites were included. The mean follow-up duration was 68.4±11.7 (60-102) months. On average, 10.6±3.5 levels were fused. Preoperatively, 64 (24.2%) patients were using opioids. The rate of opioid users increased to 33.6% at 6 weeks and decreased to 21.5% at 6 months. During follow-up, there were patients who discontinued opioids, while others have started and/or restarted using opioids. As a result, 59 (22.3%) patients were still on opioids at the latest follow-up. Multivariate analyses showed that factors independently affecting opioid use at an average of 68 months postoperatively, in order of significance, were opioid use at six weeks follow-up, preoperative opioid use and opioid use at six months follow-up with the odds ratios of 2.88, 2.51 and 2.38 respectively. At these time points, factors such as age, number of comorbidities, tobacco use, the time of the last prior spine surgery and postoperative sagittal plane alignment affected opioid usage rates.



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Binary Tree Diagram



**Conclusion:** Opioid usage at six weeks was found to be more predictive of long-term opioid use compared to preoperative use. Adjustment of modifiable factors within six weeks might likely alter opioid addiction or dependence in long-term. Differences observed among sites points towards a room for improvement. Patients should be well informed to have realistic expectations regarding opioid use when considering adult spinal deformity surgery.

**Keywords:** Opioid medication, narcotic drugs, adult spinal deformity, spinal surgery



S-028

## EXAMINATION OF THE RELATIONSHIP BETWEEN THE WALTER REED VISUAL ASSESSMENT SCALE, ROSENBERG SELF-ESTEMATED SCALE AND QUALITY OF LIFE IN ADOLESCENT IDIOPATIC SCOLIOSIS

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**Aim:** The presence of deformity in adolescents, who are a biopsychosocial being, causes cosmetic concerns, social and psychological problems. Self-esteem is the state of individuals making self-evaluations and being at peace with the results. Negative perception of the body negatively affects self-esteem. Many studies have shown that deterioration in body image negatively affects quality of life. But few researchers have examined its effect on self-esteem. The aim of this study is to investigate the effect of quality of life and deformity perception on self-esteem. In addition, the relationship between the degree of curvature and the type of curvature with self-esteem, quality of life and perception of deformity was also examined.

**Method:** 78.9% of the participants were girls and 21.1% were boys. The table summarizes the data of the participants (Table 1). Self-esteem was evaluated with the Rosenberg Self-Esteem Scale (RSES), the perception of deformity with the Walter Reed Visual Assessment Scale (WRVAS) and the quality of life SRS-22 questionnaire. Curvature types were determined according to the Rigo Classification. The degree of curvature, curvature types, the existence of correlations between the scales and their sub-parameters were questioned.  $p < 0.05$  was considered statistically significant.

**Results:** A positive correlation was found between Cobb angle and WRVAS score. Curvature angle and SRS22 sub-dimensions were negatively correlated with function score. No correlation was found between the degree of curvature and the RBS score. A negative correlation was found between RBSE score and SRS22 total score and sub-parameters function, body image and mental health scores. There was no correlation between RSQ and WRISS total score. There was a negative correlation between WRGSS scores and SRS-22 function, body image, and scale total scores. No correlation was found between Srs22 and its sub-parameters, curvature type, and scaler and sub-parameters (Table 2). Treatment of the dreamers satisfaction was low. In addition, the better the relationship between our patients and their father, the better their physical health.



S-028

Table 1. The Data of The Participants

Table 1. The Data of The Participants				
	Min	Max	Median Values	S.D
Age	10	18	13,82	2,01
Size	136	179	161,93	8,44
Weight	36	89	52,25	11,63
Degree Of Curvature	11,80	46,70	26,0298	9,24
RSES	0,25	4,91	1,3547	1,05
srs22 pain	2,20	4,20	4,3088	2,79
srs22 Self image	1,40	5,00	3,3789	0,78
srs22 Mental health	1,60	4,30	3,0298	0,59
srs22 Satisfaction/dissatisfaction with management	1,00	5,00	3,9386	0,79
srs22 total	2,40	4,80	3,6667	0,49
Walter Reed Visual Assessment Scale	7,00	21,00	12,9649	3,26

Table 2. Comparison of Curvature Type and Scales and Sub-Dimensional Scores

	Rigo Classification	N	Median ± SD	F	p	Post-Hoc
RSES	3 curve (A1,A2,A3)	8	1,12±0,54	0,381	0.767	-
	4 curve (B1,B2)	21	1,34±0,95			
	non3 non 4(C1, C2)	11	1,63±1,63			
	Singel lomber/thoraco-lumbar(E1, E2)	17	1,30±0,95			
WRVAS	3 Curve (A1, A2, A3)	8	14,00±2,45	2,687	0.056	-
	4 Curve (B1, B2)	21	13,57±4,20			
	Non 3 Non 4 (C1, C2)	11	13,82±2,04			
	(4) E Group	17	11,18±2,24			
SRS 22-total	3 Curve (A1, A2, A3)	8	3,64±0,36	0,505	0.681	-
	4 Curve (B1, B2)	21	3,62±0,55			
	Non 3 Non 4 (C1, C2)	11	3,58±0,53			
	Singel Lomber/Thoraco-lombar(E1, E2)	17	3,79±0,46			



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SRS22- function	3 Curve (A1, A2, A3)	8	4,19±0,35	1,322	0.277	-
	4 Curve (B1, B2)	21	4,07±0,70			
	Non 3 Non 4 (C1, C2)	11	4,13±0,60			
	Singel Lomber/Thoraco-lombar(E1, E2)	17	4,45±0,57			
SRS22- Pain	3 Curve (A1, A2, A3)	8	3,93±0,83	1,044	0.381	-
	4 Curve (B1, B2)	21	3,81±0,81			
	Non 3 Non 4 (C1, C2)	11	4,00±0,76			
	Singel Lomber/Thoraco-lombar(E1, E2)	17	5,31±4,93			
SRS22- Self image	3 Curve (A1, A2, A3)	8	3,33±0,50	1,561	0.210	-
	4 Curve (B1, B2)	21	3,53±0,87			
	Non 3 Non 4 (C1, C2)	11	2,95±0,77			
	Singel Lomber/Thoraco-lombar(E1, E2)	17	3,49±0,75			
SRS22- mental health	3 Curve (A1, A2, A3)	8	3,03±0,43	0,358	0.783	-
	4 Curve (B1, B2)	21	2,94±0,68			
	Non 3 Non 4 (C1, C2)	11	3,17±0,62			
	Singel Lomber/Thoraco-lombar(E1, E2)	17	3,05±0,55			
SRS22-Satisfaction/dissatisfaction with management	3 Curve (A1, A2, A3)	8	3,94±0,62	0,297	0.827	-
	4 Curve (B1, B2)	21	3,90±1,03			
	Non 3 Non 4 (C1, C2)	11	4,14±0,67			
	Singel Lomber/Thoraco-lombar(E1, E2)	17	3,85±0,61			

No statistically significant difference was found between the scales we used and the sub-dimension scores and the curvature type groups

**Conclusion:** AIS not only affects the spine of patients, but also affects all components (physical, mental, and social) of the adolescent, which is a biopsychosocial entity. Individuals with AIS with low self-esteem move away from a state of complete physical and mental well-being. In addition to correcting the bodily deformity, the individual should be treated holistically by considering treatments aimed at maximizing the individual's health status and quality of life with multidisciplinary and interdisciplinary approaches. In future studies, comprehensive studies on the sociocultural dimensions of the subject should be included.

**Keywords:** Adolescent idiopathic scoliosis, self-esteem, quality of life



S-029

## THE EFFECT OF HALO-GRAVITY TRACTION ON LARGE AND RIGID DEFORMITIES OF THE SPINE

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<sup>1</sup>Başakşehir Çam ve Sakura Şehir Hastanesi

<sup>2</sup>Medicana International İstanbul-Beylikdüzü

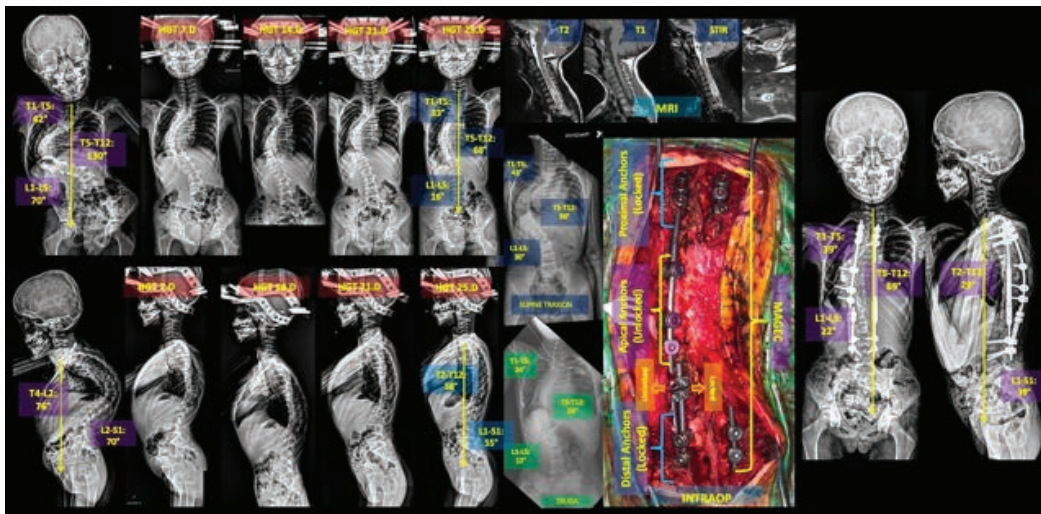
**Aim:** Large and rigid deformities of the spine can be difficult to treat. Indications for Halo-Gravity traction (HGT) are curves  $>70^{\circ}$ - $80^{\circ}$ , marked hyperkyphosis, and  $<20\%$  improvement in traction radiographs. In our study, the effect of HGT application in cases with large and rigid spinal curvature was investigated.

**Method:** Patients who underwent HGT before posterior spinal surgery (PSC) due to large and rigid spine deformities were included in the study. For HGT, 4-8 pins were placed under anesthesia depend on the age and development of the patient, as described by D'Astous and Sanders. HGT was gradually increased not to exceed 50% of the patient's weight and was applied for 12 hours/day, allowing patient mobilization using a wheelchair and walker. Demographic characteristics of the patients, duration of HGT application, preoperative anesthesia risk groups (ASA) value, need for additional surgery, complications, scoliosis Cobb angle and thoracic kyphosis angle before/after surgery were controlled (Table 1).

**Results:** HGT was applied to 10 cases (70% women) due to large and rigid deformity of the spine. The causes of scoliosis were idiopathic (1), neuromuscular (1), congenital (4) and syndromic (4). Pre-operative ASA value was III in 4 cases and II in 6 cases. The age at which HGT was applied was  $14.7 \pm 5.6$  years, the duration of application was  $36.7 \pm 9.2$  days, and the follow-up period after surgery was  $10.7 \pm 7.7$  months. Preoperative scoliosis Cobb angle was  $109.6^{\circ} \pm 18^{\circ}$ , final control was  $58.3^{\circ} \pm 17.5^{\circ}$ , improvement was 46.8%. Preoperative thoracic kyphosis was  $83.5^{\circ} \pm 38.5^{\circ}$ , the final control was  $46.7^{\circ} \pm 19.9^{\circ}$ , improvement was 44.1% (Figure 1). Neurosurgical procedure was performed in two cases due to intraspinal pathology (split cord, tethered core). Two-stage surgery was performed after HGT in three cases (30%), and one-stage surgery was performed in other cases. There were no pin-related complications after HGT. Complications occurred in 3 cases after surgery. Proximal screw revision after early proximal screw loosening was performed in one case, and post-operative early surgical field debridement was performed in one case. One case required surgery for gastric perforation and decubitus ulcer. Except for one case, no neurological problems were encountered. In the patient who developed partial neurological deficit, a significant improvement was achieved as a result of rehabilitation.

**S-029**

Figure 1



8 y F, EOS (Syndromic; Ehler Danlos), Arachnodactyly, increased joint laxity. Serial casting has been applied 7 times before. On MRI, there is syringomyelia between C4-T7 with a length of 6.5 mm and a width of 2.5 mm at its widest point. In the evaluation of Pediatric Cardiology; Aortic regurgitation (mild), Mitral valve prolapsus, Mitral regurgitation (mild-moderate) are present. 26 days after HGT was applied, left convex double rod was applied from the posterior and MCGR was applied to the concave side. The operation time was 7 hours, the amount of bleeding was 200 cc, transfusion was not required. She was tongued with a corset in the early postoperative period. Follow-up was 4 months.

**Conclusion:** Regardless of the underlying etiology, HGT can be used in patients with large, firm scoliotic curves. It can be a useful tool for the safe conclusion of treatment.

**Keywords:** Halo-Gravity Traction, Kyphosis, Scoliosis, Spine deformity



S-030

## THE EFFECT OF NEUROMUSCULAR SCLIOSIS SURGERY ON PELVIC OBLIQUITY

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<sup>2</sup>Medicana International İstanbul-Beylikdüzü

**Aim:** Neuromuscular diseases commonly cause scoliosis deformity and pelvic obliquity (PO), as well as severe spinal deformities that require surgical treatment. When evaluating the outcome of neuromuscular scoliosis (NMS) surgery, detailed analyzes of its effects on PO correction are required. In our study, the effects of correction of spinal deformity on PO in patients operated for NMS were investigated.

**Method:** Major Cobb, kyphosis and lordosis angles of the spines of the patients who were operated for NMS were measured using the O'Brein and Maloney technique for PO (Figure 1). Before and after surgery, those who underwent sacroiliac fixation (SF) were compared with those who did not.

**Results:** 27 patients (13 female, 14 male) were operated for NMS. SF was administered to 15 patients (7 women, 8 men), but not 12 patients (6 women, 6 men). The mean follow-up period was 13.1 months (1-25 months), and an average of 14.4 months in those who underwent SF. While 18 of the 27 patients could not be mobilized, 9 could be mobilized with or without support. O'Brien's angle was 19° (11-28.5) and Maloney's angle was 14° (8.5-26) in patients who required SF, and 5° (2.75-6.25) and 5° (1-10.25) in patients who did not require SF. While there was a statistically significant decrease in major cobb, kyphosis, O'Brien and Maloney angles after NMS surgery, no significant change was observed in lordosis angle. When those who underwent SF were compared with those who did not, there was no statistically significant difference in Cobb, kyphosis, lordosis, and postoperative Maloney angles before and after surgery (Table 1). There was a significant difference between the preop and postop O'Brien and preop Maloney angles, with and without SF. SF was applied in patients with high O'Brien and Maloney angles. While the Maloney angles became similar postoperatively, the O'Brien angles were still higher than the patients who did not undergo SF, although there was a decrease in the SF group. When the preop and postoperative comparisons were made in the SF group, Cobb, kyphosis, O'Brien and Maloney angles decreased significantly, while lordosis angles did not change.

Table 1

	No Sacral Fixation (n=12)	Sacral Fixation (n=15)	P
Gender**	F = 6, M = 6	F = 7, M = 8	
Age	13.25 (9-19)	14.867 (5-36)	
Cobb Preop	69.083 (51-90)	73.8 (14-120)	0.605
Cobb Postop	26.5 (20.5-55)*	26 (18-60.5)*	0.696***
Kyphosis Preop	46.917 (2-82)	52.4 (10-87)	0.572



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Kyphosis Postop	41.083 (9-57)	36.4 (11-67)	0.458
Lordosis Preop	44.5 (8-75)	47.4 (1-114)	0.747
Lordosis Postop	43.667 (15-64)	34.6 (7-62)	0.163
OBrien Preop	5 (2.75-6.25)*	19 (11-28.5)*	0.004***
OBrien Postop	4 (3-5.25)*	13 (7-16)*	0.005***
Maloney Preop	5 (1-10.25)*	14 (8.5-26)*	0.015***
Maloney Postop	5 (2.5-8)*	10 (2.5-14)*	0.365***

Summary statistics and hypothesis test results between patients with and without sacral fixation, “\* median(1st Qt-3rd Qt) due to nonnormal distribution whereas others are mean(min-max) \*\* F=Female, M=Male \*\*\* Mann-Whitney U test”

**Conclusion:** In the presence of significant PO in NMS, SF should be preferred. When SF is applied, significant improvement in PO and spinal deformities can be achieved.

**Keywords:** Neuromuscular scoliosis, Pelvic obliquity, Sacroiliac fixation, O’Brein technique, Maloney technique



**S-031**

## **RESULTS OF FLUOROSCOPY-GUIDED MEDIAL BRANCH BLOCK FOR THE TREATMENT OF LOWER LUMBAR FACET JOINT PAIN: A 2-YEAR FOLLOW-UP**

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**Aim:** Lumbalgia is the most common musculoskeletal disease in the adult population. Lumbar disc hernias are the most common cause of lumbalgia; followed by pathologies related to the facet joint. lumbar facet syndrome; It is the degeneration of the lumbar facet joints with advancing age. Invasive interventions including blockade of the medial branch and intra-articular injections can be applied. The most important indications for facet joint injection are facet degeneration detected radiologically and chronic low back pain and tenderness over the facet joint. In our study, we shared the results of patients who had medial branch block and facet joint blockage in our clinic with the diagnosis of facet degeneration.

**Method:** In this study, the medical records of 243 patients who underwent facet joint block and medial bundle branch block injection in our clinic between 2018 and 2020 were reviewed. In the analysis of the data, the demographic information of the patients, whether they benefited from the procedure, and whether they needed additional treatment after the procedure were evaluated.

**Results:** 150 female patients and 93 male patients were included in the study. (mean age: 54.55). While 62.5% of the patients experienced permanent pain relief after the first facet blocking injection attempt, 5.7% had only a temporary reduction in their pain and required retreatment after an average of 8.4 months. 11.4% of the patients required decompression and instrumentation surgery within the next 24 months. In addition, 5.7% of the patients who did not benefit from the treatment required orthopedic and 14.7% physical therapy and rehabilitation treatment.

**Conclusion:** Facet joint block injection is a form of treatment with a high chance of success because it is less invasive than surgical procedures and eliminates the need for ongoing treatment from other branches in facet joint pain.

**Keywords:** Blok enjeksiyonu; faset eklem; medial dal; sinir bloğu.



S-032

## A COMPARATIVE ANALYSIS OF SKELETAL MATURITY STAGING SYSTEMS BY MEANS OF LONGITUDINAL GROWTH AND CURVE MODULATION PREDICTION AFTER VBT SURGERY

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**Aim:** Risser has been a standard skeletal maturity assessment method for AIS patients. Sanders Skeletal Maturity Staging (SSMS), a more comprehensive system, became popular, especially in decision-making for Vertebral Body Tethering (VBT). Thumb-Ossification Composite Index (TOCI), using ossification of thumb epiphyses, has been claimed to more accurately stage patients at their peak height velocity (PHV). However, around adolescence, growth peaks may occur separately at lower limbs and trunk. Hence, Cervical Vertebral Maturity (CVM), using cervical spine morphology, possesses a potential to better estimate spinal growth. The aim of this study was to compare the predictive abilities of different methods for longitudinal growth and curve modulation after VBT.

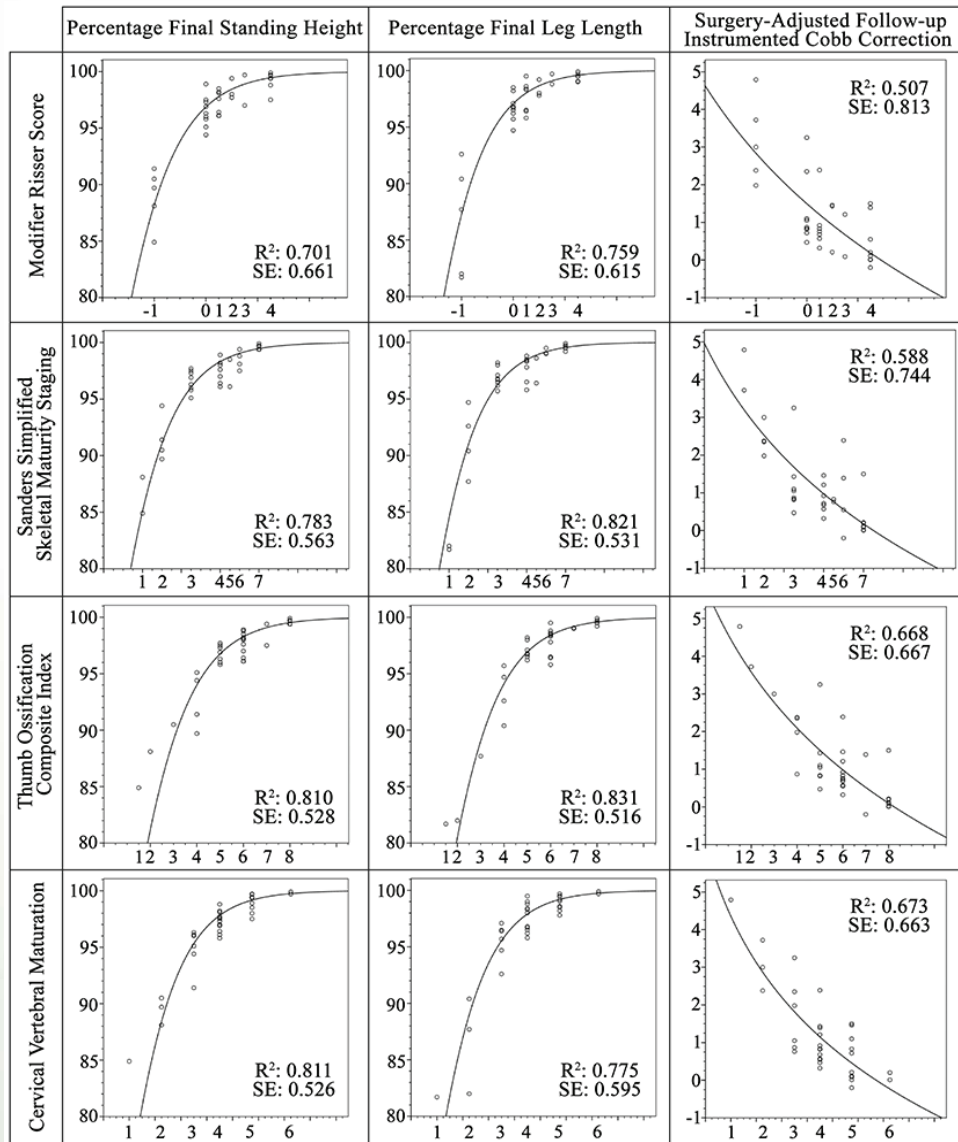
**Method:** A retrospective analysis was performed on a prospectively collected data. Demographic and radiographic data were analyzed. Skeletal maturity was determined using all four systems (Risser, SSMS, TOCI and CVM) for each patient. Crosstabulations of axial vs appendicular markers were formed. Predictive abilities were compared for total height gain, leg length growth and curve modulation (follow-up instrumented Cobb correction after index operation). Logistic and logarithmic regression models were run to assess longitudinal growth and growth modulation, respectively.

**Results:** 34 patients (32F, 2M) were included. The mean age at surgery was 12.8±1.5 years. The mean follow-up duration was 45.3 (24-80) months. The median preoperative stages were: Risser: 1 (-1-4), SSMS: 4 (1-7), TOCI: 6 (1-8) and CVM: 4 (1-6). Preoperative mean height of 155.7 cm (130-171) was increased to 162.9 cm (151-177) at latest follow-up. All patients reached skeletal maturity. The mean preoperative instrumented Main Thoracic (MT) curve magnitude of 45.0°±7.3° was corrected to 20.7°±6.1° at first-erect, which was modulated to 8.4°±13.3°. R-squared values for Risser, SSMS, TOCI and CVM were 0.701, 0.783, 0.810 and 0.811, respectively, for prediction of final height; 0.759, 0.821, 0.831 and 0.775 for final leg-length, and 0.507, 0.588, 0.668 and 0.673 for curve modulation (Fig 1). Concordance and discordance were observed between axial vs appendicular systems that demonstrated a range of possible scenarios and distribution of CVM: 1) Trunk PHV before Height PHV, 2) simultaneous PHVs, 3) Trunk PHV after Height PHV.



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### Logistic & Logarithmic Regression Models



**Conclusion:** TOCI and SSMS had similar leg-length predictions that outperformed CVM. However, in terms of prediction of total height gain and curve modulation after surgery, CVM and TOCI were superior to SSMS. Mutual use of axial and appendicular markers may provide an improved decision-aid.

**Keywords:** adolescent idiopathic scoliosis, growth modulation, vertebral body tethering, skeletal maturity assessment



S-033

## RELIABILITY ANALYSIS OF SMARTPHONE USE IN KYPHOSIS ANGLE MEASUREMENT

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**Aim:** The measurement of kyphosis angle plays a critical role in treatment planning and prognosis prediction in patients with vertebral deformity or fracture. In addition to the manual measurement on radiographs, which is the traditional method in the evaluation of kyphosis, computer-assisted measurements and smartphone applications have also begun to be used. In this study, the main aim is to evaluate the reliability of smartphone use in measuring kyphosis angle. In addition, it is aimed to evaluate the measurement with the help of a smartphone in the selection of the end vertebra.

**Method:** Lateral scoliosis radiographs of 30 patients (9 males, 21 females; mean age:  $38.8 \pm 15.0$  years) over 18 years of age with kyphotic deformity were evaluated retrospectively from the radiology archive. The kyphosis angle was measured with 3 different techniques; manually with the help of a ruler, using a computer-aided system and using a smartphone. The end vertebrae and kyphosis angles selected for kyphosis assessment were recorded. Measurements were made by 2 researchers. The intra- and inter-observer reliability of the end vertebrae selection and measurement methods were analyzed. Statistical evaluation of the confidence analysis was done by calculating the ICC correlation coefficients.

**Results:** The mean kyphosis angle was measured as  $48.3^\circ \pm 11.9^\circ$  in the manual method,  $51.0^\circ \pm 11.9^\circ$  in the computer assisted system, and  $53.1^\circ \pm 11.7^\circ$  using the smartphone. For kyphosis angle measurement, intraclass correlation coefficients were calculated as 0.909, 0.955 and 0.980, respectively, in manual, computer-assisted system and smartphone measurement. Correlation coefficients for inter-observer assessments were calculated as 0.889, 0.942 and 0.962 for manual, computer-assisted system and smartphone measurements, respectively. When results were compared, the agreement between manual and smartphone measurement in end vertebra selection was 85% and it was 90% between computerized measurement and smartphone measurement.

**Conclusion:** It can be stated that the smartphone-assisted method for end vertebra selection is advantageous over other techniques as it allows dynamic measurement compared to other methods of choice. In addition to that, the measurement of kyphosis angle measurement with a smartphone is equivalent to a computer-assisted system. It can be stated that the measurement method with a smartphone is an appropriate, reliable, repeatable and easy evaluation technique, especially in the selection of end vertebra for kyphosis angle measurements.

**Keywords:** kyphosis, end vertebra selection, kyphosis angle, reliability analysis, smartphone



**S-034**

## NAVIGATING THE SPINE WITH AUGMENTED REALITY: A SINGLE CADAVER STUDY

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**Aim:** The incorporation of augmented reality (AR) technology into spinal navigation systems presents a promising approach to advancing the field of spinal surgery. By merging virtual and real environments, AR holds the potential to enhance the precision and effectiveness of these systems. Our objective is to investigate the application of AR in spinal interventions.

**Method:** An application was developed for a single cadaver using Unity and Vuforia software development kit. This application was installed on the Microsoft HoloLens 2, allowing the 3D images of the cadaver spines to be displayed on the cadavers. The precision of needle placement for facet joint injections was evaluated through post-procedure CT scans.

**Results:** An independent radiologist rated needle placements. A total of 12 spinal needles targeting facet joints were inserted at six levels from T12-L1 to L5-S1 in a single cadaver. Post-procedure control CT scans revealed that all 12 needles were accurately positioned within the facet joint spaces.

Control CT



**Conclusion:** This research illustrated the accuracy of AR-guided facet joint injections, suggesting that employing an AR headset could serve as an alternative to traditional spinal neuronavigational techniques. Additional research with larger, controlled groups is needed to enhance our findings. (Project no: AOS-Startup-21-037 was supported by AO Foundation, AO Spine is a clinical division of the AO Foundation – an independent medically-guided not-for-profit organization based in Davos, Switzerland.)

**Keywords:** Augmented Reality, Spinal Navigation



S-035

## ASSESSMENT OF THE QUALITY AND RELIABILITY OF YOUTUBE AS AN INFORMATION SOURCE FOR TRANSFORAMINAL INTERBODY FUSION

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**Aim:** Transforaminal lumbar interbody fusion (TLIF) is a modification of the posterior lumbar interbody fusion technique (PLIF) and was first applied by Harms and Rolinger in 1982. (Collis, 1985) TLIF is gaining popularity with its high fusion rate, good clinical results, and low complication rates. People are trying to research their diseases on the internet independently of physicians and to gain knowledge in their own way (Wasserman et al., 2014). Patients often refer to video resources about how the surgery is done. Youtube is one of the most basic video-sharing sites where it is easy to Access, and most information can be obtained (Fox S., 2011). Since the content of the videos cannot be checked by the experts on the subject. At the same time, they are being uploaded; there are doubts about the accuracy and reliability of the information. The current study aims to assess the quality and reliability of the information in Youtube videos on Transforaminal Interbody Fusion.

**Method:** 100 videos were listed by typing “TLIF”, “TLIF surgery”, and “transforaminal interbody fusion” in the youtube search engine. The top 50 most popular videos based on video power index (VPI), view ratio and exclusion criteria were selected for review. One orthopaedic surgeon and one neurosurgeon analysed the videos together. Modified DISCERN score, Global Quality Score (GQS), the Journal of the American Medical Association (JAMA) score, and a novel interbody fusion score were used to evaluate videos. Data of video length, view count, number of likes and dislikes, like ratio (likex100/[like+dislike]), video source and comment rate were collected.

**Results:** The quality of the videos could have been better according to all scoring systems, regardless of the video source. The scores of the videos published by patients and commercials were significantly lower than those of physicians and allied professionals ( $p < 0.05$ ). VPI and view ratios were similar in all sources.

### Descriptives of the results

	Median	Minimum	Maximum	Mean	Standard Deviation
GQS	2	1	4	2	1
JAMA	1	0	3	1	1
Modified DISCERN score	1	0	5	1	1
Interbody Fusion Score	4	0	10	4	2
Video Length	6,45	1,10	223,10	18,90	40,37
View Count	10436	1548	1581639	67249	226923
Timesince upload/MONTHS	63	14	212	73	48



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view ratio	7,97	,42	365,19	27,51	61,99
Like	70	1	3500	265	684
Dislike	0	0	0	0	0
like ratio	100	100	100	100	0
number of comment	2	0	573	30	94
comments/year	,62	,00	286,50	9,16	40,68
VPI[like ratio × view ratio/100].	7,97	,42	365,19	27,51	61,99

## Descriptives of the results

**Conclusion:** The study demonstrates that YouTube™ videos providing information related to TLIF surgery is available and accessed by the public. The results of this study would suggest that YouTube™ is not currently an appropriate source of information on TLIF surgery for patients. Most of the youtube videos about TLIF surgery contain information about the surgical technique and have limited information about the post-operative condition of the patients.

**Keywords:** TLIF, Youtube, GQS score, JAMA score, DISCERN score



S-036

## INVESTIGATION OF THE RELATIONSHIP BETWEEN SPINE STRUCTURE AND MOBILITY IN THE SAGITTAL PLANE AND PHYSICAL ACTIVITY AND FUNCTIONAL MOBILITY IN WOMEN WITH HYPERKYPHOSIS

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**Aim:** Spinal deformity; may affect the level of physical activity and functional mobility. In this direction, our study aimed to examine the relationship between the spine structure and mobility in the sagittal plane and the level of physical activity and functional mobility of women with hyperkyphosis.

**Method:** Sixty-one women with hyperkyphosis [age; 63.00 (52.00/67.00) years, body mass index; 29.14 (25.24/32.00) kg/m<sup>2</sup> thoracic angle; 57.00 (49.00/64.00) degree] were included in the study. Spinal structure and mobility were evaluated with the HocomaValedo®Shape (Idiag, Fehraltorf, Switzerland) device. Measurements were made on the spinous processes between C7 and S2 in the sagittal plane in standing upright, maximum trunk flexion, and maximum trunk extension position. Physical activity level and sitting times were evaluated using the 'International Physical Activity Questionnaire' and functional mobility level was evaluated using the 'Timed Up and Go Test'.

**Results:** In our study, it was found that the thoracic angle was negatively correlated with physical activity level, and weakly positively correlated with sitting time (respectively  $r=-0.369$   $p=0.003$ ,  $r=0.337$   $p=0.008$ ), while the sacral angle was weakly negatively correlated with sitting time ( $r=-0.387$   $p=0.002$ ). It was observed that thoracic and lumbar mobility were negatively correlated with the functional mobility level (respectively  $r=-0.353$   $p=0.005$ ,  $r=-0.360$   $p=0.004$ ), and spinal inclination mobility was moderately negatively correlated with the functional mobility level ( $r=-0.433$ ,  $p<0.001$ ). There was no correlation between other spine angles and mobility and sitting time, physical activity, and functional mobility level ( $p>0.05$ ).

**Conclusion:** In women with hyperkyphosis, it was observed that the sitting time increased and the level of physical activity decreased with the increase in the thoracic kyphosis. At the same time, it was found that decreased spinal mobility negatively affected the level of functional mobility. The increase in the thoracic kyphosis affects the structure and mobility of the spine, causing a decrease in the physical activity levels of women and negatively affecting their functional mobility levels. Worsening of functional mobility can lead to falls and many secondary problems. To prevent these problems, it is important to guide to prevent the increasing angle of kyphosis in women.

**Keywords:** Spinal deformity, Physical activity, Sitting time, Functional mobility



S-037

## THE OUTCOMES AND COMPLICATION RATES OF THE ADULT SPINAL DEFORMITY SURGERY REPORTED FROM A SINGLE DEDICATED SPINE CENTER

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**Aim:** The aim of the current study is to report the clinical outcomes, radiographic parameters, and complications seen in patients with adult spinal deformity (ASD) who were operated by a single dedicated spinal surgeon and to assess the clinical outcomes, radiographic parameters, and complications at 2-year follow-up. The hypothesis was that the complication rate was higher than that reported previously by multicenter studies which may be secondary to underreporting the complications, missing or faulty medical records, poor patient follow-ups, study populations with different risk potentials, or more limited surgical approaches.

**Method:** This was a retrospective review of the prospectively collected data of patients who underwent ASD surgery performed by a single surgeon. The deformities secondary to tumoral entities, syndromic curves, neuromuscular disorders, patients with  $\leq 4$  levels of fusion, those without at least 2-year follow-up, and those with anterior-only surgery were excluded. All the patients recruited to the study had one of the following criteria; coronal Cobb angle  $\geq 20^\circ$ , sagittal vertical axis (SVA)  $\geq 50$  mm, pelvic tilt  $\geq 25^\circ$ , or thoracic kyphosis  $\geq 60^\circ$ . All the parameters were evaluated just before the surgery and at 2-year follow-up. The Oswestry Disability Index (ODI), Scoliosis Research Society-22 (SRS-22), Short-Form-36 (SF-36), back and leg pain visual analogue scores (BP-VAS and LP-VAS, respectively), and American Society of Anaesthesiologists (ASA) scores were the clinical assessment parameters. The radiographic assessment included the coronal and sagittal Cobb angles of the main deformities, sagittal vertical axis (SVA), L1-S1 lordosis (LL), pelvic incidence (PI), pelvic tilt (PT), PI-LL, and the coronal balance (C7PL-CSVL). All life threatening and re-admission related complications were defined as major.

**Results:** There were 49 patients with a median age of 50 (22-82). Radiographic and HRQoL results and their change in two years may be seen in Table 1. After 2-year-follow-up, the median BP-VAS changed from 5(0-10) to 4(0-10)( $P=.025$ ), the median LP-VAS changed from 5(0-10) to 0(0-10)( $P=.021$ ), the median ODI changed from 53.5(0-92) to 30(0-88)( $P=.001$ ), the median SRS-22 changed from 3(2-4) to 4(2-5)( $P<.001$ ), and the median SF-36-PCS changed from 37(20-66) to 46.4(0-65.8)( $P<.001$ ). On the other hand, complication-free patients were only 40.8%, while 44.9% had major and 14.3% had minor complications.



S-037

Table 1

Radiographic or HRQoL parameter	Preoperative median (min-max)	Postoperative last visit median(min-max)	P value
Major curve Cobb angle	25	11.5	<.001
Lomber lordosis (LL)	-50	-38.35	0.97
Thoracic kyphosis	38.5	49	.021
Coronal imbalance	2.5 (-44.24-91.26)	-0.5 (-54.55-45)	.931
Sagittal vertical axis (SVA)	31.9 (-50.62-144.28)	57.88 (-38.79- 114.1)	.943
Pelvic tilt	26 (2-45)	25 (10-48)	.036
Pelvic Incidence (PI)	55 (37-82)	53 (34-76)	.737
Sacral slope	29.5 (10-63)	26.5 (9-54)	.018
PI-LL	14 (-32-82.3)	16 (-19-95.5)	.334
Global tilt	27 (2-63)	30.8 (1-58)	.253
Back pain Visual Analog Scale (VAS)	5 (0-10)	4 (0-10)	.025
Leg pain VAS	5 (0-10)	0 (0-10)	.021
COMI Back	6 (2-9)	4 (0-8)	.001
ODI	53.5 (0-92)	30 (0-88)	<.001
SRS 22	3 (2-4)	4 (2-5)	<.001
SF36PCS	37 (20-66)	46.42 (0-65.76)	<.001
SF36MCS	40 (26-63)	43.025 (28.95-58.11)	.194

The preoperative and postoperative radiographic datas and health-related quality of life (HRQoL) measures and statistical analysis result of the differences of each parameter

**Conclusion:** The patient-reported outcome measures were all improved after ASD surgery at 2-year follow-up, despite the lack of radiographic support. However, the complication rate was around 60% which is significantly higher than the reports in the literature. We assume this may be due to differences in patient population and/or underreporting of complications in other studies.

**Keywords:** Adult spinal deformity, Spine surgery complications



**S-038**

## COMPARISON BETWEEN TRADITIONAL RADIOLOGICAL PARAMETERS AND A NOVEL ANGLE MEASUREMENT TECHNIQUE IN CERVICAL SPINAL STENOSIS

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**Aim:** Several parameters such as anterior-posterior spinal canal diameter, Torg-Pavlov ratio (TPR), maximum canal compromise (MCC) and spinal cord occupation rate (SCOR) have been suggested for radiological evaluation of cervical spinal stenosis. Our aim in this study is to evaluate the narrowing of the cervical spinal canal via angular measurements between the osseous components of the canal and compare the efficacy of this method with traditional radiological parameters.

**Method:** The participants are divided into two groups: a control group (group 1) and a patient group (group 2). Patients with neck pain without accompanying radiculopathy, neurological deficit, and myelopathy are included in group 1. The inclusion criteria for group 2 are: 1)TPR<1.2 2)spinal canal AP diameter<15 mm 3)SCOR >0.7 in sagittal imaging 4)ligamentum flavum hypertrophy, disc degeneration, or osteophyte formation 5)neurological symptoms attributed to cervical stenosis 6)patients in whom surgical intervention is required. In MR imaging; TPR, MCC, and SCOR were measured in C4-5-6 segments along with the bilaminar angle, laminar angle, pedicle angle, pediculolaminar angle, and pediculolaminar angle.

Angle measurements of spinal canal

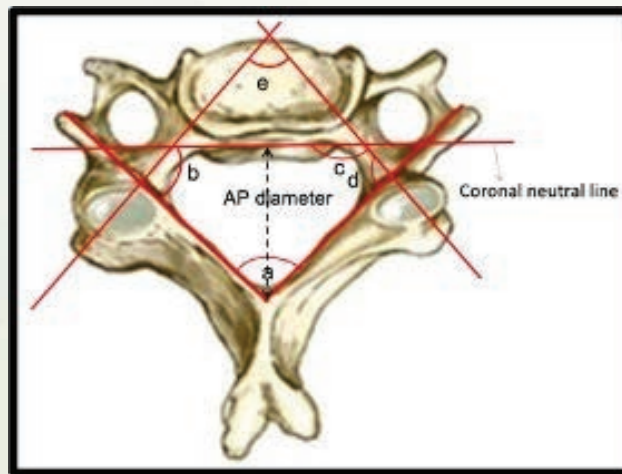


Illustration of angular measurements. a)bilaminar angle; b)laminar angle; c)pedicle angle; d)pediculolaminar angle; e)bipedicular angle



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**Results:** The average age was 44.68 in Group1 and 57.42 in Group 2. The female/male ratio was 1.3 in Group 1 and 0.59 in Group2. The average bilaminar angle was 115.82 in group 1; 123.411 in group 2, bipedikular angle was 95.67 in group 1; 87.667 in group 2, pedicular angle was 134.971 in group1; 135.134 in group2, laminar angle was 37.674 in group 1; 35.297 in group 2, pediculolaminar angle was 84.284 in group 1; 78.194 in group 2. The average TPR was 1.331 in group1; 0.508 in group2, MCC was 0.955 in group 1; 0.362 in group 2, SCOR was %53.1 in group1, %71.9 in group2. TPR was statistically the most superior method compared to other traditional parameters. Bilaminar angle was higher in group2( $p<0.05$ ) and bipedicular angle was higher in group1( $p<0.05$ ). This difference between groups in these angles were similar with TPR measurements. There was no significant statistical difference in angular measurements between vertebral levels. Her iki grupta da açılara bakıldığında vertebra seviyeleri arasında istatistiksel anlamlı bir farklılık görülmemiştir.

**Conclusion:** Radiological evaluation in cervical stenosis has an essential role in decision-making for surgical intervention. Measurement of angles constituting the borders of the spinal canal has similar efficacy with traditional methods for determination of the severity of the stenosis. Bilaminar and bipedicular angles may be used to determine the congenital basis of spinal stenosis and risk stratification for developing cervical spondylotic myelopathy in the future.

**Keywords:** cervical spinal stenosis, congenital spinal stenosis, cervical spondylotic myelopathy, angle measurement, radiological parameters



S-039

## TRANSFORAMINAL INJECTION TREATMENT OF LUMBAR DISC HERNIATION: PLATELET-RICH PLASMA VERSUS STEROID WITH PLATELET-RICH PLASMA

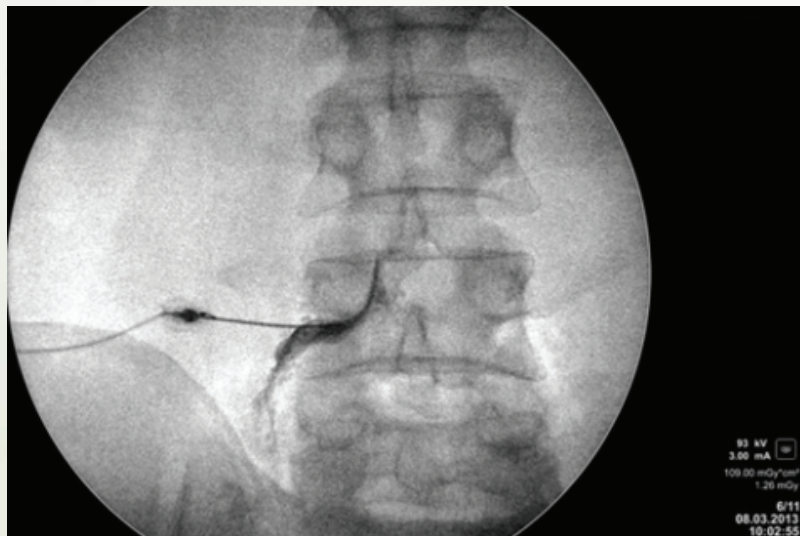
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**Aim:** Transforaminal steroid therapy is widely used in the treatment of lumbar disc herniation. However, due to the narrow range of steroid use and the high negative effects, there are problems in its use. The effect of platelet-rich plasma (PRP), which is widely used in the last waves, contains high amounts of growth factors and cytokines and plays an important role in anti-inflammatory, anti-apoptotic and proliferative effects, on radicular painful lumbar disc herniation remains unclear. This result proposes to review the clinical positive and negative results of transforaminal PRP and Steroid-PRP results under the guidance of fluoroscopy in patients with lumbar radicular pain complaints due to lumbar disc herniation.

**Method:** In the study, PRP (n = 30) or combined injection therapy (n = 32) was applied to a total of 62 patients, aged 20-60 years, diagnosed with CT or MRI and admitted to the orthopedics and traumatology clinic due to lumbar disc herniation, in the form of transforaminal under the guidance of fluoroscopy. Patients 1 week before and 1 week, 6 months after the procedure, visual analog scale (VAS), pressure pain thresholds (PPT), Oswestry disability index (ODI), physical function (PF), bodily pain (BP) domains with SF-36 evaluated according to the scoring.

Transforaminal Injection



Transforaminal PRP and Steroid-PRP results under the guidance of fluoroscopy



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**Results:** There was no statistical difference between the two groups in terms of age and gender ( $P > 0.05$ ). In both groups, VAS (median 7.3 before 1 week, 2.9 p < 0.01 after 6 months), PPT (median 570.50 before 1 week – 706.40 p after 6 months) evaluated 1 week before and 6 months after the procedure < 0.01), ODI (median 34.30% before 1 week – 21.20% after 6 months p < 0.01), SF-36 (median PF 62.00 1 week before, BP 43.00 – PF 87 after 6 months) .00, BP 54.00 p < 0.01, p < 0.01) scores improved significantly. While there was a significant difference in all scores 1 week before and 1 week after the procedure in the combined injection group, there was no significant difference in only the PRP group. There was no significant difference in scoring between the two groups at 6 months after the procedure. No adverse effects were observed in either group.

### Demographic Datas

	Combined group	PRP group	p
Age (y, median)	54,0	55,0	0,9
Gender ( N, Female)	13	14	0,145
VAS ( median)	7.3	7.3	0,108
PPT ( kPa, median)	570,50	580,30	
ODI (% , median)	34,30	36,40	0,482
PF of SF-36 ( median)	62,00	60,00	0,88
BP of SF-36 ( median)	43,00	41,00	0,396

Demographic characteristics and baseline information of patients before 1 week.

**Conclusion:** This study suggests that in the treatment of radicular painful lumbar disc herniation, transforaminal PRP and Steroid-PRP injections administered with scopy have similar long-term effects, and combined injection therapy may be a more effective alternative treatment method when compared in the short-term.

**Keywords:** TRANSFORAMİNAL İNJEKTİYON, LUMBAR DİSK HERNİYASYON, PLATELET-RİCH PLASMA, STEROİD, RADİKULAR PAİNFUL



S-040

## EVALUATION OF THE EFFICIENCY OF THE DUAL DRAIN SYSTEM IN THE TREATMENT OF CSF FISTULA DEVELOPED AFTER SPINAL STENOSIS SURGERY

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**Aim:** Complications such as iatrogenic dural tear and related cerebrospinal fluid (CSF) fistula can be seen in spinal stenosis surgery. Treatment options for CSF fistula include immobilization, medical treatments restricting CSF production, closed subfascial and subcutaneous drain systems, lumbar drainage, and dural repair with reoperation. Among these, good management of the insertion and removal process of closed drain systems is very important for wound healing. In this article, we aimed to present the efficacy of subcutaneous and subfascial closed drain systems in the treatment of 51 patients who developed CSF fistula after spinal stenosis surgery.

**Method:** This study was conducted prospectively on 51 patients who had a dural tear and associated CSF fistula that we operated with the diagnosis of spinal stenosis between 2018 and 2023. Dural tears were repaired by intraoperative primary suturing or placing defected fascia. These patients were divided into 2 groups. Only subfascial hemovac drains were placed in 15 patients in Group A and their drains were removed on the 12th postoperative day. In Group B, subcutaneous drains were placed in 36 patients, both subfascial and over the fascia. The subfascial drain was removed on the 10th postoperative day and the subcutaneous drain on the 12th day.

**Results:** Of the 51 patients included in the study, 16 (31%) were male and 35 (69%) were female, and the mean age of the patients was 59.6 years. CSF fistula persisted in 5 (33%) of 15 patients after subfascial drains were removed on the 12th postoperative day. A subcutaneous drain was placed in these patients under local anesthesia and they were followed for 1 more week. After the drains were removed, it was observed that there was no discharge in all 5 patients. After all drains were removed on the 12th postoperative day, CSF leakage was observed in 4 (15%) of 36 patients, and it stopped spontaneously after 3 days without any additional procedure.

**Conclusion:** CSF fistula, which may develop due to dural tears in spinal stenosis surgery, is an important complication that can take a long time to treat. Especially in this period, it is critical for the wound to heal completely so that the skin integrity is ensured. We believe that the subfascial and subcutaneous dual drain system placed after intraoperative dural repair in patients who develop CSF fistula may be an effective method that can be applied in the treatment of CSF fistula by contributing to wound healing.

**Keywords:** Spinal stenosis, dural tear, CSF fistula, hemovac drain



## S-041

### IMPLEMENTING AN INFECTION CONTROL CHECKLIST MAY NOT BE EFFECTIVE IN REDUCING THE INCIDENCE OF SURGICAL SITE INFECTIONS IN SPINAL SURGERY

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**Aim:** Surgical site infections (SSI) in instrumented spinal surgery (ISS) remains as a major complication with increased morbidity, prolonged hospital stays and economical burden. Although implementation of surgical safety checklists has been reported to lower the rates of SSI, reproducibility of these remain unclear. The specific aim of this study was to explore the results of implementation of SSI control protocol in regard to its efficacy in decreasing the rate of SSI.

**Method:** A total of 140 ISS cases were divided into two groups as Group 1 (checklist implemented) and Group 2 (control) and were compared regarding SSI rates, patient and surgery related factors, laboratory findings and infecting microorganisms. The infection control checklist developed by El-Gafi et al which has been reported in the current literature with significant decrease of postoperative spinal wound infection was implemented for Group 1. This original protocol includes those following ten particular steps: 1. preoperative glycemic management based on hemoglobin A1c; 2. preoperative skin preparation with 2% chlorhexidine gluconate disposable scrubs; 3. limiting operating room traffic; 4. cutting the number of staff in the room to the minimum required; 5. absolutely no flash sterilization of equipment; 6. double-gloving with frequent changing of outer gloves; 7. local vancomycin powder application; 8. re-dosing antibiotic every 4 hours for prolonged procedures and extending postoperative coverage to 72 hours for high-risk patients; 9. subcutaneous tissue irrigation with diluted povidone-iodine solution after deep fascial closure; and 10. use of DuraPrep skin preparation at the end of a case before skin closure.

**Results:** Ten SSIs were encountered in Group 1 out of 48 surgeries (20.8%), whereas only 9 in Group 2 out of 92 surgeries (9.8%). Although not statistically significant ( $p>0.05$ ), these results highly favor the non-checklist implemented group regarding the development of SSI. A definitive infective microorganism could be identified in 5 out of 10 SSI in Group 1 and 6 out of 9 in Group 2. Whereas only 3 out of 11 (27.3%) involved Gr (+) agents, rest of 8 out of 11 (72.7%) involved Gr (-) agents.



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## Details of patients diagnosed and treated as/for SSI

Patient number	Checklist (Y/N)	Basis of SSI diagnosis	Outcome
I	Y	Drainage from wound, persistently high CRP	CRP back to normal after 6 weeks of oral antibiotics
II	Y	Drainage from wound, persistently high CRP	CRP back to normal after 6 weeks of oral antibiotics
18	Y	Persistently high CRP, increase in pain at post-operative 72 h	Resolution of symptoms after 6 weeks of oral antibiotics
22	Y	Drainage from wound, persistently high CRP	CRP back to normal after 8 weeks of oral antibiotics
24	Y	Drainage from the wound, E. Coli and K. Pneumoniae	Irrigation and debridement, resolution after 6 weeks of IV antibiotics
33	Y	Drainage from wound, persistently high CRP	CRP back to normal after 6 weeks of oral antibiotics
35	Y	Drainage from wound, MRSA	Irrigation and debridement, resolution after 6 weeks of IV and 4 weeks of oral antibiotics
39	Y	Drainage from the wound, E. faecalis	Resolution after 3 weeks of IV and 3 weeks of oral antibiotics
41	Y	Drainage from the wound, MSSA	Resolution of symptoms after 6 weeks of oral antibiotics
48	Y	Drainage from the wound, staph epidermidis	Resolution of symptoms after 6 weeks of oral antibiotics
74	N	Drainage from the wound, E. Coli, E. Faecalis	Irrigation and debridement, resolution after 6 weeks of IV antibiotics
79	N	Drainage from the wound, E. Coli	Resolution after 3 weeks of IV and 3 weeks of oral antibiotics
91	N	Drainage from wound, persistently high CRP	CRP back to normal after 6 weeks of oral antibiotics
98	N	Drainage from the wound, K. Pneumoniae, E. Cloacae	Irrigation and debridement *3, resolution after 6 months of continuous IV and oral antibiotics
104	N	Drainage from wound, S. Capitis	Resolution of symptoms after 6 weeks of oral antibiotics
105	N	Drainage from wound, high fever, persistently high CRP	Resolution after 3 weeks of IV and 3 weeks of oral antibiotics
112	N	Drainage from wound, E. Coli	Resolution after 3 weeks of IV and 3 weeks of oral antibiotics
127	N	Drainage from wound, persistently high CRP	CRP back to normal after 6 weeks of oral antibiotics
130	N	Drainage from wound, P. Mirabilis	Resolution after 3 weeks of IV and 3 weeks of oral antibiotics

**Conclusion:** A failure in decreasing the SSI rate through the implementation of a SSI prevention checklist may be due to several factors pertaining to the study design, patient characteristics and the Gr(-) dominance in SSIs in our center. Nevertheless, this suggests that checklist implementation to prevent SSI in instrumented spine surgery may not be effective and is arguable in aspect of the reproducibility of it.

**Keywords:** spinal surgery, surgical site infection, checklist, prevention



S-042

## BALLOON KYPHOPLASTY IN THE TREATMENT OF MULTIPLE MYELOMA: THE ROLE OF LEVEL SELECTION ON MULTIPLE SEGMENTAL INVOLVEMENTS OF THE SPINE

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**Aim:** Multiple myeloma is a B cell-origin disease of the bone marrow. Spine involvement in multiple myeloma is usually generalized, and treating these lesions can be challenging. Conventional surgical procedures must be reserved for patients with neurological deficits or spinal instability. Minimal invasive procedures such as cement augmentation via balloon kyphoplasty or vertebroplasty have recently become popular for treating multiple myeloma with spine involvement. This study aimed to investigate our institution's mid-term results of percutaneous balloon kyphoplasty (PBK) in patients with multiple myeloma.

**Method:** Patients admitted to our clinic between July 2021-December 2022 with the diagnosis of multiple myeloma have been retrospectively investigated. There were 78 patients with multiple myeloma with spinal involvement. Among them, patients treated with BKP were selected for the study. During the BKP procedure, a bone biopsy was obtained through the pedicle to confirm the diagnosis of multiple myeloma. All the patients were operated on under local anesthesia combined with sedoanalgesia and were discharged the day after the surgery. Patients treated conservatively are excluded from the study.

**Results:** The study consists of 13 patients (18 levels). 10 patients were male, and 3 were female. The mean age of the patients was 63,2. The mean follow-up period was 8.9 months. There was a single-level lesion in 4 patients, while there were multiple segmental lesions in 9 patients. Five levels were L4, three levels L3, four levels L2, three levels L1, two levels T12 and one level T11. No cement leakage to the epidural space has been observed. Cement leakage on disk space was observed in 1 patient, and the patient was asymptomatic. Local kyphosis angle improved from 22,2 degrees to 12,5 degrees postoperatively. The mean preoperative visual analog score (VAS) improved from 8,28 to 2,35 in the immediate postoperative period, and the sixth-month follow-up score was 2,64. There was a better clinical outcome in the BKP procedure in low-lumbar segments compared to the thoracolumbar junction, especially in patients with multiple-segment spine involvement.



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A 76 y Female, Postoperative Ap and Lateral view at 1st day



A 76 y Female, Postoperative Ap and Lateral view at 1st day. The photograph shows percutaneous balloon kyphoplasty after L3 compression fracture due to multiple myeloma.

**Conclusion:** BKP is a minimally invasive and safe procedure for treating spinal lesions in low lumbar segments in the presence of multiple myeloma. In the presence of multiple-level involvement, clinical assessment should be made carefully to select the level of BKP. According to our procedure, the most caudal vertebrae must be selected in case of multiple-level involvement to better restore the patient's local kyphosis angle and pain scores. Low lumbar segments should be preferred in the presence of multiple-level disease.

**Keywords:** Multipl Myeloma, Spine involvement, local kyphosis angle, visual analog score, Percutan balloon kyphoplasty



S-043

## THE QUALITY ASSESSMENT OF YOUTUBE™ VIDEOS ABOUT SCOLIOSIS

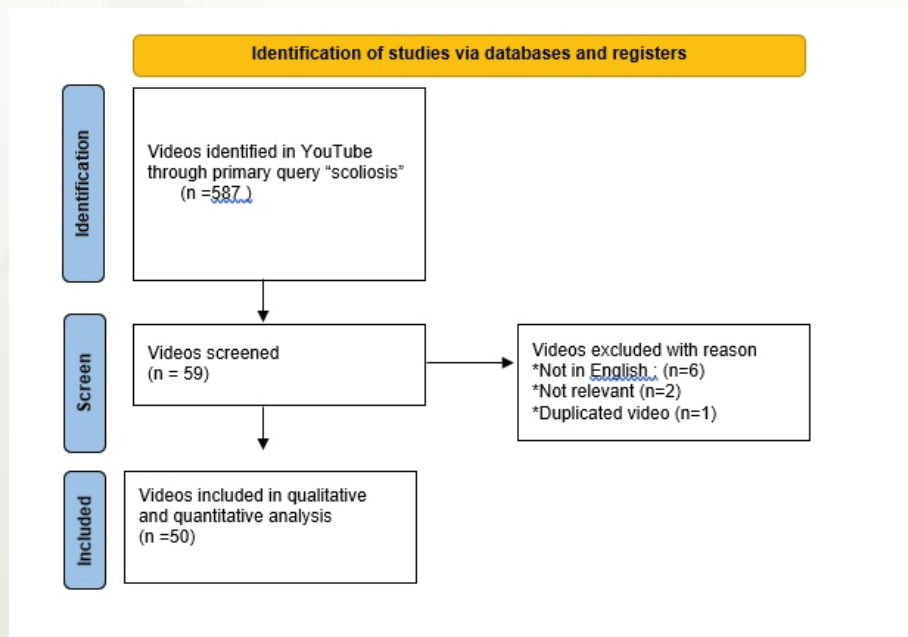
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**Aim:** YouTube is one of the most commonly used internet sources. Most patients watch YouTube videos for gathering more information, especially about health issues. However, everyone, not just professionals, can upload videos on any subject to the youtube site. This may lead the way for the presentation of wrong and incomplete information, especially on important issues such as health, with videos. This study aimed to investigate the informative capabilities of YouTube videos about Scoliosis.

**Method:** The first 50 videos in the English language, from the keyword query “scoliosis” in YouTube search, were analyzed (Figure 1). Source of information, video duration, video age, Number of views, comments and feedback were gathered for assesment. JAMA (The Journal of American Medical Association) criteria were used to assess video reliability, and Scoliosis Specific Score (SSS) were used to assess the quality of content. Data analysis was conducted using SPSS V26.0 (IBM Corporation, Armonk, NY).

Figure 1. Flowchart diagram



Workflow of video selection



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**Results:** Total number of views was 37506251 with a median value of 24031(160-17443638). The total number of comments was 27251 with a median value of 29.5 (0-17679). The total feedback count was 619791 with a median value of 402 (6-296639). Total positive feedback was 606454 with a median value of 391 (6-290126). Total negative feedback was 13337 with a median value of 8 (0-6513). Median SSS was 6 (1-16), JAMA was 2 ( 1-4), video duration was 325 seconds (53-1319), and video age was 1127 days (12-4229). SSS was positively correlated with JAMA score (p:0.03) and video duration (p:0.033). JAMA score was positively correlated with video duration (p:0.019), views (p:0.033), comments (p:0.049), total feedback (p:0.014), and positive feedback (p:0.014).

**Conclusion:** It has been shown in the literature that many YouTube videos about various health issues are insufficient. However, in our study, an increase in video quality is observed when compared to the study conducted in 2015 on the same subject. Considering that the videos deal with certain issues related to Scoliosis, we believe that different evaluation methods should be produced in order to evaluate the real quality.

**Keywords:** Scoliosis, deformity, YouTube, quality, spine



S-044

## ARE THERE ANY CHANGES IN THE CRANIOCERVICAL JUNCTION AFTER PEDIATRIC CONGENITAL SCLIOSIS SURGERY?

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**Aim:** The full evaluation of the effects of craniocervical junction (CSJ) scoliosis surgery in pediatric congenital scoliosis (CS) is insufficient. It was aimed to investigate the effects of surgical treatment on CSJ in CS.

**Method:** Patients who underwent spinal CT examination including CSJ before and after scoliosis surgery, and those who underwent CT for preoperative, postoperative and other reasons without spinal problems were considered as the control group. Basion-axial interval (BAI), basion-dens interval (BDI), posterior atlantodental interval (PADI), anterior atlantodental interval (ADI), atlanto-occipital interval (AOI) and Powers ratio measurements were performed on CT. The groups were compared with each other to evaluate the effect of congenital scoliosis surgery on CSJ.

**Results:** Posterior instrumentation and fusion surgery were performed on 23 pediatric patients (15 women, 8 men) who were operated for congenital scoliosis. The mean age in the CS group was 11 (8.5-13.5) years, and the mean age in the control group was 12.8 (6-18) years. While there was no difference between preoperative and postoperative measurements in BDI, there was a significant difference between preoperative and control groups, and postoperative and control groups. While BAI measurements of congenital cases did not show variability preoperatively and postoperatively, it was found to be different with the control group. There was no significant difference between the groups in other measurements.

Table 1

	Preop CS (n=23)	Postop CS (n=23)	Control (n=100)	Preop-Postop P	Preop- Control P	Postop- Control P
Gender***	F=15, M=8	F=15, M=8	F=50, M=50			
Age	11-10.87 (8.5-13.5)	11 (8.5-13.5)	13(10-16)			
BAI(mm)	7.22 (5.84- 10.165)	6.59 (5.535- 8.22)	8(6.6-9.325)	0.111	0.676	<0.001
BDI(mm)	5.197 (2.250- 9.460)**	4.34 (3.725- 5.42)	3.625(3.527- 4.083)	0.324*	<0.001	<0.001
Power Ratio	0.733 (0.68- 0.775)**	0.733 (0.68- 0.775)**	0.74(0.718- 0.763)	0.099*	0.408	0.299



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ADI(mm)	2.25(1.98-2.615)	2.32(2.085-2.805)	2.4(1.7-2.825)	0.754	0.83	0.54
PADI(mm)	17.754 (15.175-20.235)**	17.16(15.15-18.39)	16.85(15.175-18.625)	0.148*	0.234	0.843
AOI(mm)	1.71(1.305-2.22)	1.97(1.33-2.46)	1.8(1.4-2.2)	0.323	0.798	0.497

\*Paired T-Test, \*\*Mean(Min - Max), whereas others are median(1st Qt-3rd Qt) due to nonnormal distribution,  
\*\*\*\*F=Female, M=Male

**Conclusion:** It was observed that surgical treatment did not cause a significant change in CSJ in pediatric CS. Since BDI and BAI in CS differ from patients without spine problems, it was recommended to evaluate CSJ before surgery in patients scheduled for surgery.

**Keywords:** Congenital scoliosis, Craniocervical junction, Computed tomography, Basion-axial interval, Basion-dens interval



S-045

## EFFECTIVENESS OF ULTRASOUND-GUIDED CAUDAL EPIDURAL STEROID INJECTION FOR PAIN RELIEF IN RECURRENT LUMBAR DISC HERNIATION

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**Aim:** Managing pain in recurrent lumbar disc herniation poses a significant challenge. This study aims to investigate the effectiveness of ultrasound-guided caudal epidural steroid injection (CESI) in relieving pain and improving function in patients with recurrent lumbar disc herniation.

**Method:** Twenty patients who had undergone lumbar disc surgery and received ultrasound-guided CESI in a neurosurgery clinic between June 2022 and March 2023 were included in this retrospective study. All procedures were performed under sterile conditions in the operating room. CESI was administered using a mixture of 1 mL betamethasone steroid and 5 mL 0.5% bupivacaine local anesthetic, diluted with 5 mL 0.9% NaCl=SF (total 11 mL), at the sacrococcygeal ligament using an ultrasonography-guided spinal needle. Contrast material and skin-level local anesthetic agents were not used during the procedure. Pain levels, measured using the Visual Analogue Scale (VAS), and functional recovery, assessed using the Oswestry Disability Index (ODI), were evaluated retrospectively preoperatively, on the first day post-operation, and at the third week post-operation.

**Results:** Of the 20 patients, 13 were women, and the mean age was  $53.9 \pm 9.13$  years. Five patients had undergone surgery at the L4-5 level, seven at the L5-S1 level, and three at both levels. Lumbar stabilization was performed in three patients, while two had undergone surgery via the L4-5 level narrow canal. Fourteen patients had undergone surgery once, four twice, and two three times. Nine patients reported right radicular pain, six left radicular pain, and five bilateral radicular pain. The mean preoperative VAS score was  $8.80 \pm 0.69$ , which decreased to  $2.60 \pm 0.75$  on the first day post-operation and  $4.2 \pm 1.19$  at the third week post-operation. The differences in VAS scores between pre-operation and the first day post-operation ( $p < 0.001$ ) and pre-operation and the third week post-operation ( $p < 0.001$ ) were statistically significant. The mean preoperative ODI score was  $48.20 \pm 10.10$ , which decreased to  $23.55 \pm 5.85$  at the third week post-operation. The difference in ODI scores between pre-operation and the third week post-operation ( $p < 0.001$ ) was statistically significant.

Table 1. Demographic and clinical characteristics of the study population (n=20)

Variable		p
Age	$53.9 \pm 9.13$	
Gender		
Male (n)	7	
Female (n)	13	



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Level of surgery		
L4-5 (n)	4	
L5-S1 (n)	7	
L4-5-S1 (n)	3	
Lumbar stabilization (n)	3	
L4-5 narrow canal (n)	2	
Effected side		
Right(n)	9	
Left(n)	6	
Bilateral(n)	5	
VAS		
Preop	8.80±0.69	
Post op 1st day	2.60±0.75	<0.001*
Post op 3 rd week	4.20±1.19	<0.001**
ODI		
Preop	48.20±10.10	
Post op 3 rd week	23.55±5.85	<0.001**

Visual Analogue Scale (VAS), Oswestry Disability Index (ODI)

**Conclusion:** Ultrasound-guided CESI is an effective treatment option for recurrent painful lumbar disc herniation. It should be considered as a method to prevent the morbidity associated with reoperations.

**Keywords:** Ultrasound, CESI, recurrent, VAS, ODI



S-046

## THE ANALYSIS OF CORONAL AND SAGITTAL SECTIONS DIFFERENCES AT POSTOP PERIOD AFTER VBT SURGERY ON PEDIATRIC NONIDIOPATHIC SCOLIOSIS CASES

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<sup>2</sup>Resident Medical Doctor

**Aim:** VBT (Vertebral Body Tethering) is a technique that has been increasingly used in scoliosis surgery in the past 10 years, and is an important surgical treatment that directs growth while preserving the dynamic structure of the vertebral column with minimal invasive surgical options. In this study, early effects of VBT treatment and changes in coronal and sagittal plane angles in 3 patients with nonidiopathic scoliosis with Cobb angle above 50 degrees were investigated in our clinic.

**Method:** In 2022, two female patients aged 11 and 14 years and one male patient aged 15 years with Cobb angle above 50 degrees who underwent VBT surgery were evaluated with postoperative follow-up to investigate the early effects of VBT. Changes in Cobb angles were recorded by comparing preoperative and postoperative imaging of the patients, and it was observed that there was an improvement of approximately 50% in Cobb angles in all three patients at the postoperative 3-month evaluation. No perioperative or postoperative complications were observed in any of the patients.

**Results:** It was observed that there was an average improvement of 20 degrees or more in coronal and sagittal section angles during the postoperative period following VBT. Within 3 months postoperatively, scoliosis radiographs of all three patients were evaluated in the coronal and sagittal planes, and it was observed that the target Cobb angle was achieved in the early postoperative period.

**Conclusion:** VBT appears to be a safe method that can be used with both minimal invasive surgical techniques and preserving the flexibility of the vertebral column in selected nonidiopathic cases, as in idiopathic scoliosis.

**Keywords:** scoliosis, VBT, vertebral body tethering, nonidiopathic scoliosis, pediatric scoliosis



S-047

## RELATIONSHIP BETWEEN LUMBAR DISC HERNIATION AND SPINOPELVIC PARAMETERS

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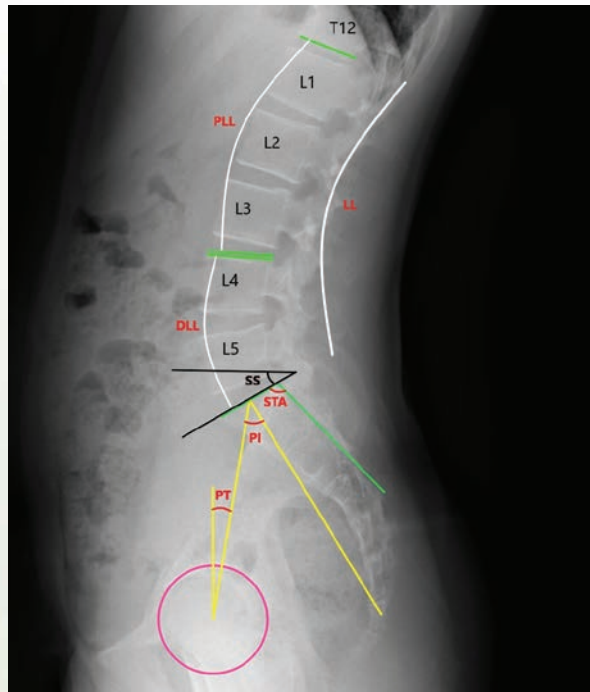
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**Aim:** Investigating the relationship between lumbar disc herniations and some spinopelvic parameters.

**Method:** 59 LDH patients and 44 normal subjects were measured for total lumbar lordosis(LL), proximal lumbar lordosis(PLL) and distal lumbar lordosis(DLL), pelvic index(PI), pelvic tilt(PT), sacral slope(SS), and sacral table angle(STA)in lateral upright standing radiographs using Surgimap software. Statistical differences between two groups were investigated.

Measurement



Measurement of spinopelvic parameters in lateral standing graphs using Surgimap Software

**Results:** There was no statistically significant difference between the two groups in terms of PI, LL, PLL, SS, and STA values. PT values were significantly higher and DLL values were significantly lower in the LDH group.(DLL  $31.67 \pm 10.85^\circ$  vs  $36.88 \pm 8.29^\circ$  ;  $p=0.019$ ;  $p<0.05$ )(PT  $15.94 \pm 6.47^\circ$  vs  $12.14 \pm 6.44^\circ$  ;  $p=0.016$ ;  $p<0.05$ )



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Table 1

	Groups			Post Hoc
	LDH (n=59) <sup>o</sup>	Normal(n=44) <sup>o</sup>	p	LDH- Normal
LL (Avg±Sd)	50,24±16,14	53,32±13,73	d0,507	0,866
DLL(Avg±Sd)	31,67±10,85	36,88±8,29	d0,023*	0,019*
PLL(Avg±Sd)	18,57±9,69	16,44±9,16	d0,380	0,0701
PI(Avg±Sd)	49,65±11,05	45,86±9,75	d0,125	0,165
PT(Avg±Sd)	15,94±6,47	12,14±6,44	<sup>d</sup> 0,020*	0,016*
SS(Avg±Sd)	33,67±9,73	33,83±7,84	d0,893	1,000
STA(Avg±Sd)	104,92±4,95	104,17±5,96	d0,523	1,000

Comparison of spinopelvic parameters between two groups. (d) Oneway ANOVA, (\*) P<0.05

**Conclusion:** After growth, it is generally considered that the morphological spinopelvic parameters PI and STA remain constant for life. Additional parameters such as LL, SS, and PT are compensatory variables which seek optimal congruence with minimal energy expenditure. In contrast to PI, PT increases with age to compensate for the loss of lordosis. The sum of PT and SS equals PI. Thus, as PT grows, SS decreases, and the sacrum becomes more horizontal. Regarding the connection between these factors and LDH, the scientific literature provides conflicting reports. Mardare et al. reported a decrease in PI, SS, and LL with increased PT in patients with LDH. Fei H et al. reported that LDH patients have lower LL and SS values and higher PT values, but that PI has no effect on the development of LDH. Strube correlated LDH with normal PI and low STA levels in patients. Benlidayı et al. concluded that there is no correlation between lumbosacral alignment and LDH. Rather than the lumbar lordosis as a single entity, it is crucial to take into account the proximal and distal lumbar lordosis. Pesenti et al. opined that proximal lordosis accounted for 38% of total lordosis, whereas distal lordosis accounted for 62% in the asymptomatic population. Hence, it can be concluded that the decrease in DLL will be more effective and impactful than the reduction in PLL. In contrast to DLL, we found no association between LL-PLL and LDH. We predict that lower DLL and increased compensatory PT values result in lumbar spine flattening and increased compressive loading, which may contribute to LDH and also disc degeneration.

**Keywords:** Spinopelvic parameters, Lumbar Disc Herniation



S-048

## THE RELATIONSHIP OF COMPLICATIONS ACCORDING TO INTRAOPERATIVE IMAGING METHODS IN THE POSTERIOR INSTRUMENTATION OF THE THORACOLUMBER SPINE WITH TRANSPEDICULAR SCREW

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**Aim:** The posterior instrumentation method with transpedicular screw is one of the most preferred methods in the thoracolumbar spine. This study was conducted to examine the difference of imaging methods in order to detect and minimize important problems such as screw malposition intraoperatively in posterior instrumentation surgery performed with transpedicular screws.

**Method:** Patients aged 18-90 years, who had not undergone spinal surgery before, and who were followed up for more than 1 year in the postoperative period were included in the study. Age, gender, etiological reasons, intraoperative imaging method, number of instrumented segments, intraoperative-postoperative complications of 80 patients were collected retrospectively from the registered documents. The patients were evaluated in two groups as those operated with O-arm CT (group A) and those operated with fluoroscopy (group B).

**Results:** Of 80 patients who underwent posterior instrumentation surgery with transpedicular screws, 63.75% (n:51) degenerative spine (spondylosis & listesis), 26.25% (n:21) traumatic fracture or dislocation, 10% (n:8) tumor cases. 50% (n:40) of the patients were women and 50% (n:40) were men. The mean age was 58.45 years (18-87). A total of 524 transpedicular screws were placed in the patients in both groups. 266 (50.76%) transpedicular screws were placed in 40 (50%) patients in group A. Then, 5 screw malpositions (1.87%) were detected in 4 patients (10% of group A) by intraoperative control with O-arm CT and the malpositioned screw was revised intraoperatively. 258 (49.23%) transpedicular screws were placed to 40 (50%) patients in group B. Intraoperative revision was performed by detecting 1 screw malposition (0.38%) in 1 patient (2.5% of those in group B) controlled by intraoperative fluoroscopy. In the early postoperative period, screw malposition that required revision was detected in 4 patients (10%) and these patients were reoperated. Screw revision was provided in 3 (75%) of them, and in 1 (25%) the screw had to be removed completely.

**Conclusion:** In conclusion, the most commonly used and cheapest imaging method intraoperatively is the fluoroscopy. It has the advantage of being easily accessible and cheap, but the possibility of reoperation is higher. Tomography is a safe technique that can increase the accuracy of screw placement during the operation. Disadvantages are that it is expensive, increases exposure to radiation, requires experienced personnel, and increases the duration of surgery. We think that the use of intraoperative tomography will be beneficial, especially in complicated cases, predicting that it will increase the surgical success.

**Keywords:** posterior instrumentation, thoracolumbar spine, transpedicular screw



S-049

## LOW-LYING CONUS MEDULLARIS RATES IN PATIENTS WITH MENİNGOMYELOCEL OPERATED IN OUR CLINIC

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<sup>1</sup>Şanlıurfa Eğitim Ve Araştırma Hastanesi

<sup>2</sup>Memorial Ataşehir Hastanesi

**Aim:** we seek for low-lying conus medullaris rates in patients with meningomyelocele.

**Method:** we selected 50 patients with meningomyelocele who were taken into operation at Sanliurfa Education and Research Hospital between January, 2021 and October, 2022. we retrospectively searched low-lying conus medullaris rates in spinal mri of patients with meningomyelocele. Patients without spinal mri were excluded. we accepted below L2-L3 disc space for abnormal localization of conus medullaris.

**Results:** 21 of 50 patients with myelomeningocele had low-lying conus medullaris in spinal mri. 12 of the patients with low-lying conus medullary were male and 9 of them were female. The mean age of their mothers was 28, with the lowest 19 and the highest 40. There was no antiepileptic use in the maternal histories. Meningomyelocele localization in a total of 21 patients was in the thoracic region in 2 patients, in the lumbar region in 11 patients, and in the lumbosacral area in 8 patients. When the MRIs of 21 patients were examined, in addition to low-lying conus medullaris, 3 patients had chiari malformation, 1 patient had chiari malformation and corpus callosum agenesis, 5 patients had chiari malformation and ventriculomegaly and corpus callosum agenesis, 1 patient had chiari malformation and ventriculomegaly, and syringing and syringomyelia and corpus callosum agenesis, chiari malformation and syringomyelia and corpus callosum agenesis in 1 patient, ventriculomegaly and syringomyelia and corpus callosum agenesis in 1 patient, and corpus callosum agenesis and ventriculomegaly in 2 patients.

**Conclusion:** There is not much information in the literature about low conus location in patients with meningomyelocele. We could not find a significant reason for the coexistence of meningomyelocele and low-lying conus medullaris. We have prepared this verbal statement to share our clinical experience.

**Keywords:** meningomyelocel, low-lying conus medullaris



S-050

## COMPARISON OF RADIOGRAPHIC AND CLINICAL OUTCOMES OF ADULT VS ADOLESCENT SCHEUERMANN KYPHOSIS PATIENTS: A MATCHED COHORT ANALYSIS AFTER SURGERY

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**Aim:** Studies comparing adult vs adolescent idiopathic scoliosis operations report less correction, more complications and less satisfaction in adults. There is limited information in regards to surgery for adult vs adolescent Scheuermann kyphosis. Furthermore, there is no consensus on surgical indications for adults, which may result in more untreated adult deformity. The aim was to compare surgical, radiographic and patient-reported outcomes of adult vs adolescent Scheuermann kyphosis patients.

**Method:** Retrospective analysis of two prospective databases. Two multi-center databases were queried for patients with  $\geq 2$  years follow-up. An adolescent comparative cohort was formed using the radiographic and surgical profile of adult cases. Magnitude of surgical correction, number of levels fused, number of osteotomies, surgical efficiency, infections, mechanical, medical and other complications, and patient-reported outcomes were compared using Chi-Squared, Independent Samples t, Mann-Whitney U and Two-way mixed ANOVA.

**Results:** 52 patients (21F, 31M) were included in the adult (n=24, mean age  $28.0 \pm 8.2$ , range 18-42) and the adolescent (n=28, mean age  $15.3 \pm 1.14$ , range 13-17) cohorts. Although estimated blood loss was similar (1242 vs 1268 ml, p=0.706), surgical time in the adult group was longer (395 vs 297 min, p=0.001), and adults required a longer hospital stay (9.6 vs 5.7 days, p<0.0001). Number of fused levels were similar (12.9 vs 12.8, p=0.536) and adults did not undergo more 3-COs (4.2% vs 3.6%, p=0.911). Less correction was achieved ( $52.2^\circ \pm 11.9^\circ$  vs  $44.3^\circ \pm 6.1^\circ$ , p<0.0001) in adults although preoperative kyphosis magnitudes was similar ( $75.0^\circ \pm 9.2^\circ$  vs  $77.9^\circ \pm 8.0^\circ$ , p=0.718). PJK/PJF, DJK/DJF, implant-related complications and rod fracture rates, as well as infections, wound,



# XV. Uluslararası Türk Omurga Kongresi “Omurgada Deformite”

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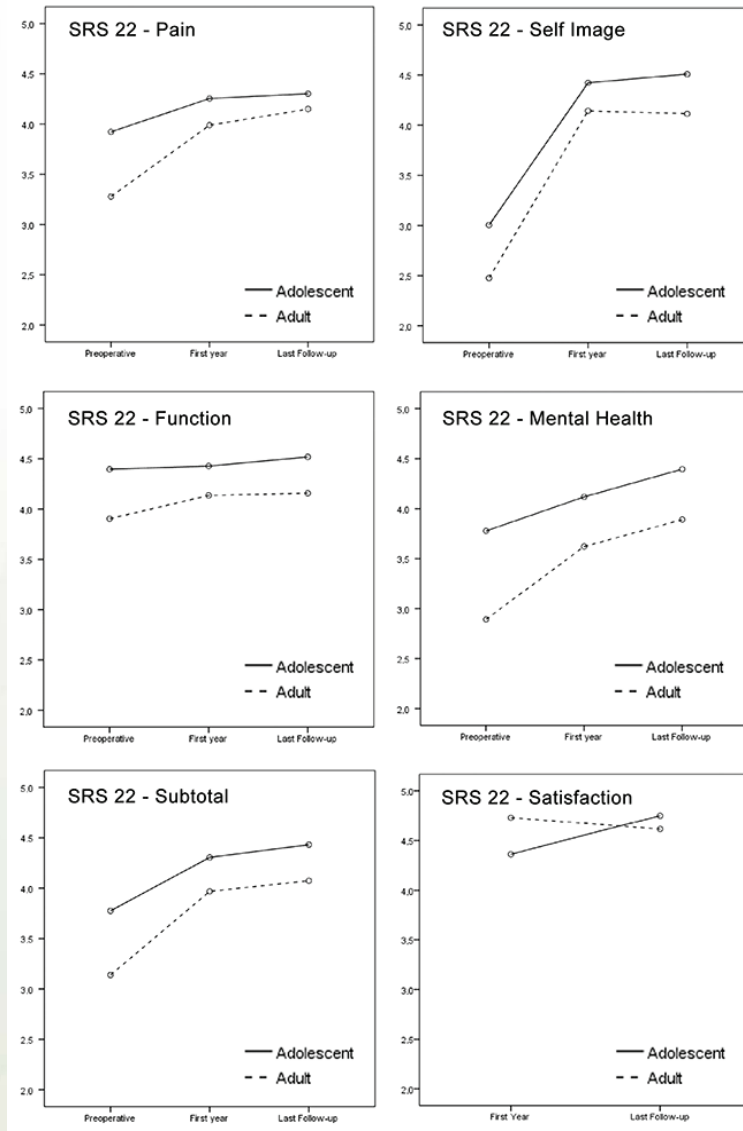
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S-050

iatrogenic, pulmonary and neurologic complications were similar among groups ( $p>0.05$  for all). All SRS-22 subdomains started off lower in adults. Although two groups showed similar improvement patterns, adults had lower scores at the latest follow-up (Fig 1).

Patient Reported Outcomes



**Conclusion:** Surgery for Scheuermann kyphosis during adulthood resulted in slightly less curve correction and longer hospital stay. Although complication rates were similar, patient-reported outcomes were less favorable at all follow-up time points for adults.

**Keywords:** scheuermann kyphosis, adult spinal deformity, complications, patient reported outcomes



S-051

## DEMOGRAPHIC ANALYSIS OF CERVICAL SPINE PEDICLES IN TURKISH POPULATION

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**Aim:** In cervical spine surgery, a thorough analysis of the cervical pedicle morphology is crucial for both the diagnosis and treatment of cervical pathologies. It is known that the morphometry of the spine can vary amongst populations. The purpose of this study was to investigate the morphological characteristics of the cervical pedicle according to gender and age in the adult Turkish population using computed tomography (CT).

**Method:** Computed tomography obtained from the local institution database of 50 patients aged between 18 and 60 years were analyzed. Pedicle width (PW), pedicle axis length (PAL), pedicle transverse angulation (PTA), and pedicle height (PH) were calculated on CT scans.

**Results:** The mean age of the patients included in this study was  $38.08 \pm 9.44$  (18–60) years. Twenty-six (52%) of the 50 patients were males and 24 (48%) were females. In CT scans, mean pedicle width (PW) was  $5.32 \pm 0.75$ , mean pedicle axial length (PAL) was  $30.42 \pm 1.82$ , mean pedicle transverse angulation (PTA) was  $43.52 \pm 3.13$ , and mean pedicle height (PH) was  $6.32 \pm 0.80$ .

**Conclusion:** CT analysis of cervical pedicle morphometry in the Turkish population revealed that the shortest PW was in the C3 vertebra and that the PW and PAL of women in the Turkish population were narrower and shorter than those of males.

**Keywords:** cervical spine, Computed tomography, pedicle morphology, Turkish population



S-052

## THE ASSOCIATION BETWEEN RADIOGRAPHIC LUMBAR SPINAL STENOSIS AND THE QUALITY OF LIFE IN THE TURKISH POPULATION

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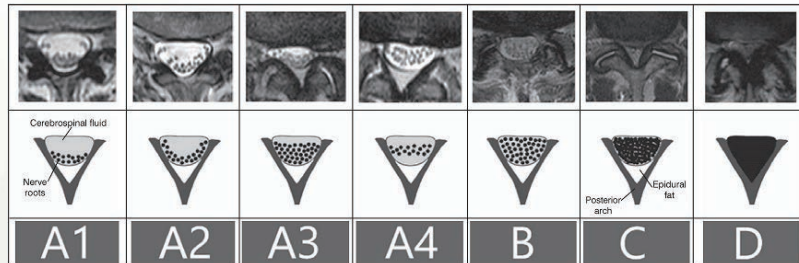
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<sup>2</sup>Özel Ömer Neşet Kişi kliniği

**Aim:** Lumbar spinal stenosis is a degenerative disease characterised by neurogenic claudication and pain. The effects on patients' radiological findings and quality of life are a matter of curiosity. This study examined the radiological findings and quality of life in patients with LSS in a Turkish cohort.

**Method:** One hundred thirty patients were evaluated, and 102 female:75 and male:27) who agreed to participate were included in the study. The patient's quality of life was assessed using ODI and radiologically using Schizas classification.

figure 1



Classification of lumbar stenosis based on the morphology of the dural sac (adapted from Schizas et al.)

**Results:** The relationship between the patients' Schizas radiological classes and Age, Height, Weight, BMI, and ODI was investigated. No statistical significance was found besides age and BMI, which are expected (table 3). In this regard, there was no correlation between Schizas and ODI, as expected.

table 1

Characteristics, n=102	Value	min	Max
Demographics			
Age (years), mean (sd)	54.4 (15.3)	40	87
Sex, n (%)			
female	75 (73.5)		
male	27 (26.5)		
Body Measures			



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Height (cm), mean (sd)	166.4 (9.50)	150	190
Weight (kg), mean (sd)	79.6 (14.0)	55	114
Body mass index, mean (sd)	29.1 (5.27)	20	41
Radiological classification (Schizas)			
B, n (%)	30 (29.5)		
C, n (%)	54 (52.9)		
D, n (%)	18 (17.)		
Clinical classification (ODI)			
ODI, mean (sd)	52.6 (16.7)	26	80
Smokers and alcohol users			
Smoker, n (%)	36 (35.3)		
Alcohol user, n (%)	12 (11.8)		

Baseline characteristics.

**Conclusion:** The most important finding of this study is that there is no relationship between the radiological stage and QoL in patients with LSS. In this context, patients' clinical symptoms should be more prominent in the treatment decisions and follow-up processes during the treatment process.

table 2

Variables	Schizas classes			Total	p
	B	C	D		
Age (years), mean (sd)	53.1 (15.9)	54.7 (13.9)	56.0 (18.7)	54.4 (15.5)	0.842
Height (cm), mean (sd)	166.8 (8.2)	166.4 (10.8)	165.8 (7.52)	166.4 (9.5)	0.919
Weight (kg), mean (sd)	83.5 (14.5)	74.6 (11.7)	88.3 (13.6)	79.6 (14.0)	<.001
Body mass index, mean (sd)	30.1 (4.6)	27.4 (4.6)	32.3 (6.4)	29.1 (5.3)	0.004
ODI, mean (sd)	58.6 (16.7)	49.9 (16.1)	51.0 (16.7)	52.6 (15.6)	0.070
ODI, mean (sd) <sup>Age</sup>					0.408 <sup>a</sup>
ODI, mean (sd) <sup>height</sup>					0.410 <sup>b</sup>

Variance analyses of Age, Height, Weight, BMI, and ODI between SCHIZAS groups

**Keywords:** lumbar spinal stenosis, Schizas, quality of life



S-053

## “T-TOOL” FOR INTRAOPERATIVE EVALUATION OF CORONAL BALANCE IN SPINAL DEFORMITY SURGERY

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**Aim:** The gold standard method for intraoperative measurement of coronal balance is suggested to be obtaining scoliosis X-rays when the patient is on the operation table. When this is not possible, the coronal balance may be evaluated with the T-Tool that our team has developed and anterior-posterior fluoroscopic images.

**Method:** The T-Tool has a size of 40 cm width and 70 cm height. This cost-free tool is made up of stainless steel. Intraoperatively, the coronal balance was measured based on the iliac crests or acetabular joints. An additional apparatus was used to confirm the balance of the arms.

**Results:** Intraoperative fluoroscopic imaging with a T-tool was performed in 1882 patients in whom spinal stabilization surgery was performed between the years 2013 and 2023. 845 of these patients underwent a deformity surgery. 6.24 (range 4-14) fluoroscopic images were obtained per patient on average. As the experience increased, the number of intraoperative fluoroscopic images decreased. Postoperative coronal imbalance was not observed in any of the patients in whom the T-tool was used.

**Conclusion:** Intraoperative evaluation of the coronal balance is fundamental after reduction and osteotomy procedures in patients with severe deformity and coronal imbalance. Postoperative coronal imbalance is a major reason for patient dissatisfaction and may predispose to repetitive surgeries. Achieving sagittal and coronal balance has an essential role in surgical outcomes in all patients that are undergoing a stabilization surgery. The T-tool is a simple and feasible method for maintaining coronal balance intraoperatively. The only limitation is the exposure to radiation due to fluoroscopic imaging.

**Keywords:** t-tool, scoliosis, deformity, coronal balance



**S-054**

## NEGLECTED CASE OF CERVICAL MENINGOCELE IN AN ADULT

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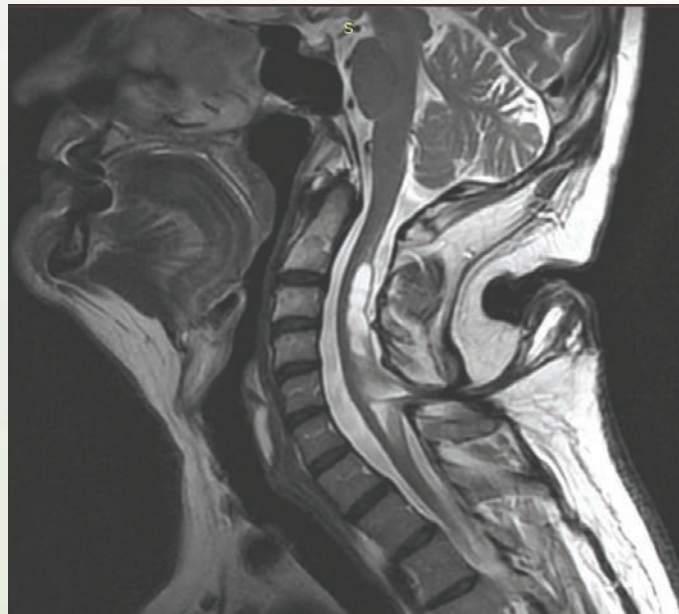
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**Aim:** Caused by a disturbance of the neurulation process, neural tube defects (NTD) are easily diagnosed and treated in the early years of life. Although early repair of NTD is advocated, there is lacking information on the natural course. There have been only 11 cases including this one reported in the literature of a cervical meningocele diagnosed and treated in an adult.

**Method:** In this case report we present a 64-year-old male patient with a neglected cervical meningocele. The patient has been aware of a skin lesion on his neck for all his life but had not consulted a physician until three years ago when he started experiencing neuropathic pain in his arms. His cervical MRI revealed a posterior arch fusion defect at the C5 and C6 spinous processes a syrinx cavity extending from C2 to the C6 levels with a tethering meningocele at the C6 level. He was operated on with the excision of the skin tag and connecting stalk. During the prone positioning and neck flexion, intra-operative neuromonitorization cautioned of a loss in MEP values thus the flexion was reduced. The skin tag was followed up until the dural defect. The bony defect was widened with laminectomies. Intradural adhesiolysis of the connecting bands around the spinal cord was performed and dura was sutured.

Pre-Operative Sagittal T2 MRI



Tethering at the C5-6 level with a syrinx cavity extending from C2 to C6.



## S-054

**Results:** The patient recovered uneventfully however still has neuropathic pain in his left arm aggravated by straining. Histological analysis revealed meningotheial cells and psammoma bodies. The postoperative MRI revealed untethering of the spinal cord with relative reduction in the syrinx cavity.

**Conclusion:** NTD are easily detected and treated early in life to prevent neurological deterioration, decrease the rate of infection and improve cosmetics. However, since they are mostly treated during childhood, its natural course in adulthood remains unknown. There are only a handful of case reports of cervical meningoceles in adults. The pathological analysis suggestive of a meningioma may also shed light into the theory of “cutaneous meningioma.” Additionally, the loss of MEP values in neck flexion should caution surgeons in avoiding hyperflexion especially in cases of spinal cord tethering.

### Previous Reports of Adult Cervical Meningocele and Myelomeningocele

Author/Year	Age/ Gender	Af- fected Level	Type	Syr- inx	Stalk Exci- sion	Untether- ing, Adhe- siolysis	Symptom	Outcome
Akay et al. 2003	21/M	C2-3	MC	-	+	+	Cosmetic	Good
Konya et al. 2006	47/M	C4-5	MC	-	+	+	Intermittent CSF leakage, lower ex- tremity stiff- ness	Improved, as- ymptomatic
Denaro et al. 2008	52/M	C4-5	MMC	+	+	+	Neurological deficits	Improved, as- ymptomatic
Duz et al. 2008	22/M	C2-3	MC	-	+	+	Intermittent CSF leakage	Good
	22/M	C4-5	MC	-	+	+	Neck pain	Good
	20/M	C3-4	MC	-	+	+	Neurological deficits	Improved, as- ymptomatic
	20/M	C6-7	MC	-	+	+	Neck pain	Good
	18/M	C6-7	MC	-	+	+	Neurological deficits	Improved, as- ymptomatic
Wang et al. 2013	21/F	C3-4	MC	-	+	+	Cosmetic	Good
Noureldine et al. 2020	47/M	C5-6	MMC	-	-	+	Neck pain, neurological deficits	Improved, mini- mum symptoms
Bozkurt et al. 2023	64/M	C5-6	MC	+	+	+	Neurological deficits	Improved, mini- mum symptoms

MC: meningocele, MMC: myelomeningocele

**Keywords:** meningocele, neural tube defect, adult, meningioma, neuromonitorization



S-055

## FUNCTIONAL AND RADIOLOGIC OUTCOMES OF LUMBOPELVIC FIXATION FOR SACRAL FRACTURES

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**Aim:** Sacral fractures can cause pain, instability, and complications such as neurologic deficits, urinary incontinence, and paralysis. The sacrum serves as the foundation for the spine and pelvis, and as such, plays a critical role in maintaining stability and transferring loads between the upper and lower body. Lumbopelvic fixation is a technique used to treat sacral fractures by restoring normal load transfer across the injured area. The rationale for lumbopelvic fixation is based on the pathomechanism of sacral fractures, which involves a combination of compressive, bending, and rotational forces that can result in complex multiplanar (especially vertically instable) fracture patterns and displacement of the sacral segments. These fractures are often associated with injuries to other parts of the spine and pelvis, such as the lumbar spine, ilium, or pubic bones, which can further complicate the treatment and prognosis of the injury. This study aimed to evaluate the functional and radiological outcomes of lumbopelvic fixation for sacral fractures.

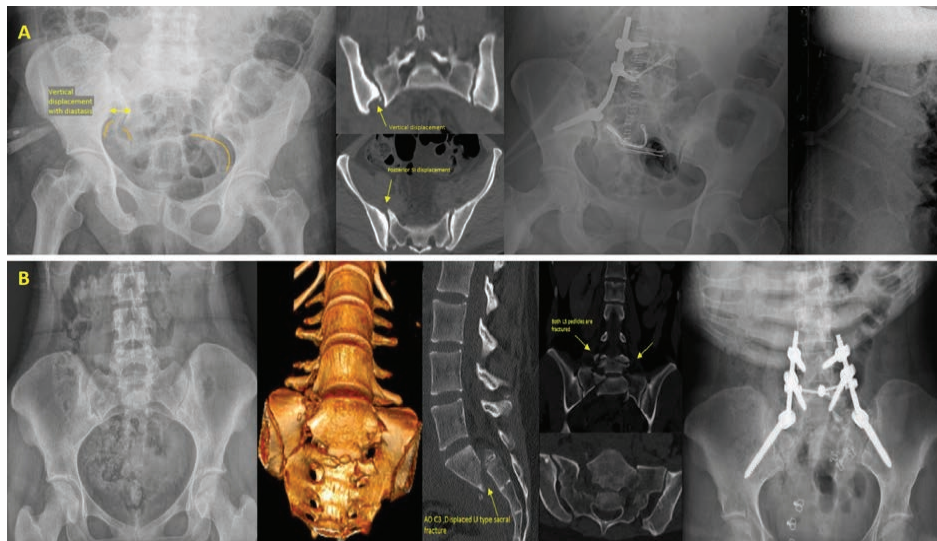
**Method:** Twenty-five patients with sacral fractures underwent lumbopelvic fixation from February 2019 to December 2021. Three patients were lost to follow-up, and the remaining 22 patients' demographics, age, injury mechanism, and characteristics were recorded. Clinical, radiologic, and functional outcomes were evaluated using various criteria, including Matta's reduction criteria, peroperative neuromonitoring activities, Majeed grading scale, Iowa Pelvic Score, SF-36 survey, early weight-bearing status, radiographically healing, and complication rate.

**Results:** All 22 patients showed radiographic healing, and none of the patients required hardware removal. In four cases, iliac screws were found to be radiographically loose in the last follow-up, but the patients refused hardware removal. There was an intraoperative improvement in neuromonitoring noted in 4 out of 9 cases. The reduction was excellent in 22 sides, good in six sides, and fair in five sides of a total of 33 sides, according to Matta's reduction criteria. The mean Majeed grading scale was 86.6, and the mean Iowa Pelvic Score was 78. The average SF-36 scores were similar to the general population. Four patients mobilized with full weight-bearing in the acute stage, and five patients mobilized with partial weight-bearing due to other orthopedic injuries. The rest of the patients managed to mobilize with full weight-bearing after the acute stage.



**S-055**

### lumbopelvic



A) A 50-year-old female MVA victim sustained right-sided sacrum fracture with marked displacement B) A 24-year-old female suffered the AO C3 - H type unstable sacral fracture with spinopelvic instability after falling from 5 metres high.

**Conclusion:** In conclusion, lumbopelvic fixation proves to be a successful method for managing unstable sacral fractures, resulting in improved functional and radiological results in both the short and long term, and allowing early weight-bearing mobilization for suitable patients.

**Keywords:** lumbopelvic fixation, spinopelvic fixation, sacral fracture, sacrum fracture, unstable sacrum



S-056

## IS POSTERIOR FUSION SURGERY SUCCESSFUL IN THE TREATMENT OF NEUROMUSCULAR SCOLIOSIS?

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**Aim:** Scoliosis is a common deformity in many types of neuromuscular disease. The aim of this study is to evaluate the radiological results, functional efficacy and complications of posterior instrumentation and fusion surgery performed in neuromuscular scoliosis patients.

**Method:** Neuromuscular patients with scoliosis deformity who were operated between 2015 and 2022 were evaluated retrospectively. 28 patients with at least 1 year of follow-up were analyzed. The patients were evaluated radiologically preoperatively and postoperatively in terms of cobb angle and pelvic obliquity. Also the patients' ages, follow-up times, preoperative and end follow-up gross motor function classification scores (GMFCS), severity of scoliosis, instrumentation levels, intraoperative blood loss, need for blood transfusion, complications and related additional surgeries were recorded.

**Results:** The average age was 14 years and the average follow-up period was 49 months. The distribution of the cases according to GMFCS was as follows; Level 2: 5 (17.8%), Level 3: 6 (21.4%), Level 4: 8 (28.5%), Level 5: 9 (32.3%). There was no change in GMFCS before and after surgery in any of the cases. According to preoperative cobb angle, moderate curve was found in 8 patients and severe in 20 patients. Measurement of the cobb angle significantly changed from  $54.4 \pm 1.62$  degrees to  $14.04 \pm 0.22$  degrees postoperatively ( $p < 0.001$ ). The mean change in the severity of scoliosis was 74.2%. Pelvic obliquity was measured as  $11.7 \pm 6.33$  degrees preoperatively and  $2.36 \pm 4.26$  degrees postoperatively ( $p < 0.001$ ). On average, 14 vertebral levels were fused and pelvis was added to the fusion site in 10 patients. Functional balance was restored with surgery in 8 patients whose sitting and walking balance was impaired. The mean intraoperative blood loss was 1200 mL and postoperative blood transfusion was required in 4 patients. Complications were observed in 9 patients (%32). Implant failure was observed in 5 patients, which required revision surgery. Superficial or deep infection was not observed in any of the cases, but wound problems developed in 3 patients that not require additional surgery. As other organ complications, pneumonia was observed in one patient in the first month postoperatively and with appropriate treatment, recovery was achieved.

**Conclusion:** According to the findings of this study, posterior instrumentation and fusion surgery is an extremely effective treatment method, considering the significant improvement in radiological and functional parameters. Also it is possible to prevent major complications with the correct preoperative planning by experienced surgeons.

**Keywords:** neuromuscular diseases, scoliosis, pelvic obliquity, complication



S-057

## BISPECTRAL INDEX (BIS) MONITORING IN ENDOSCOPIC LUMBAR SPINE SURGERY: RETROSPECTIVE ANALYSIS OF CENTRAL NERVOUS SYSTEM COMPLICATIONS

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**Aim:** Endoscopic spinal surgeries are gaining importance as minimal invasive techniques. Unilateral biportal endoscopic spinal surgery (UBE) involves two separate portals for viewing and working. Continuous flow of irrigation fluid between two portals creates a working space and provides a clear view. If the outflow of irrigation fluid is blocked, cerebrospinal fluid pressure may increase. This can lead to increased intracranial pressure and related CNS complications. Depending on the sudden increase in intracranial pressure, transient cerebral hypoperfusion may occur, which is observed as an isoelectric pattern on the BIS monitoring. There is currently no non-invasive method available to monitor the increase in intracranial pressure, and it was aimed to investigate the use of BIS monitoring for this purpose.

**Method:** Bispectral index (BIS) is an electroencephalography (EEG) parameter that monitors hypnotic and sedative effects of anesthetic agents. The target values for surgical anesthesia are between 40-60. The value of 0 (zero) is referred to as an isoelectric EEG, indicating absence of brain activity. BIS monitoring was applied to patients who underwent unilateral biportal endoscopic lumbar surgery in our clinic to detect the sudden increase in intracranial pressure noninvasively. Cases with a follow-up period of less than 3 months were excluded. The intraoperative BIS values of the patients and postoperative neurological complications were evaluated retrospectively.

**Results:** Between July 2017 and December 2022, a total of 2330 levels of endoscopic spinal surgery (UBE) were performed on 1505 patients diagnosed with spinal stenosis or lumbar disc herniation in our clinic. Postoperative visual impairment due to intraocular hemorrhage was observed in 2 of these patients. Retinal hemorrhage was resorbed in both patients, and permanent visual impairment did not occur. As of May 2022, BIS monitoring was applied to all patients who underwent UBE surgery in our clinic. Between this date and December 2022, 111 patients underwent UBE surgery. Isoelectric BIS pattern was observed intraoperatively in 6 of these patients. In these cases, it was observed that the isoelectric pattern lasted for a period of 3-5 minutes. A case of retinopathy due to increased intracranial pressure was observed in 1 of these 6 patients. No neurological complications were observed in the other 5 patients.

**Conclusion:** BIS monitoring is a non-invasive technique that can monitor cerebral hypoperfusion due to sudden intracranial pressure increases. BIS monitoring should be used in all patients undergoing UBE surgery to reduce neurological complications.

**Keywords:** Bispectral index (BIS), isoelectric EEG, endoscopic spine surgery, retinopathy, intracranial pressure



**S-058**

## VARIATIONS IN THE EXTENSION OF THE L5 TRANSVERSE PROCESS TO THE SACRUM AND IMPACT ON LUMBOSACRAL FUSION SURGERY

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<sup>3</sup>Nörospinal Akademi

**Aim:** Long-segment fusion surgeries in degenerative spinal pathologies may aggravate mechanical stress on the lumbosacral junction. Anterior interbody fusion and pelvic fixation techniques have been suggested to overcome this problem, however, there is no definite algorithm for the exact indications of these methods. Our scope in this study is to evaluate the impact of the anatomical variations in the L5 transverse process and sacrum interrelationship on the necessity of L5-S1 interbody fusion and the generated amount of fusion.

**Method:** Patients in whom spinal instrumentation including the lumbosacral junction was performed for spinal stenosis, degenerative scoliosis, and degenerative sagittal deformity were included in this study. The horizontal length of the TP and the vertical distance of the most lateral end of the TP, Castellvi grade, and intervertebral disc height were recorded from the preoperative CT. Control CT scans were obtained postoperatively on 3rd week and 2nd year. The number of instrumented levels, insertion of an interbody fusion in L5-S1, pedicle fusion of L5-S1 (Lenke grading), and interbody cage fusion (Bridwell grading) were evaluated on the postoperative 2nd-year CT. For clinical evaluation, preoperative and postoperative VAS scores were recorded.

**Results:** 79 patients were included in the study. The mean age was 61.86. 51 were female and 28 were male. The diagnosis was spinal stenosis in 38, degenerative scoliosis in 17 and sagittal deformity in 24 patients. The mean number of instrumented vertebral levels was 7.06. In all patients, Castellvi grade 2B or higher had a higher amount of fusion according to Lenke grading. In patients with anterior interbody cages, the Bridwell grade increased with a shorter vertical distance between L5 TP and sacrum. Implant failure and pseudoarthrosis were observed in 4 patients with Castellvi 1B and 2A grade and who did not receive an anterior interbody fusion. The highest amount of fusion was detected in patients with Bridwell grade 3A or higher with anterior interbody fusion. The improvement of the VAS score and the Castellvi grade were not found to be statistically correlated.

**Conclusion:** The anatomical interrelationship between the L5 TP and sacrum may be utilized for prognostication of the amount of fusion after instrumentation including the lumbosacral junction and may be used for preoperative surgical planning. A higher Castellvi grade and a shorter vertical distance between L5 TP and sacrum may reduce the risk of postoperative pseudoarthrosis and implant failure rates.

**Keywords:** interbody fusion, transverse process, lumbosacral junction, Castellvi classification



S-059

## RESULTS OF 360 DEGREE FIXATION WITH SPINAL INSTRUMENTS IN PELVIC INJURIES WITH SPINOPELVIC INSTABILITY

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<sup>1</sup>Ankara Etlik City Hospital

**Aim:** Although various surgery methods have been described in the emergency treatment of spinopelvic unstable pelvis injuries that cause hemodynamic instability, there is no study in the literature on the use of 360-degree fixation with anterior INFIX and posterior spinopelvic fixation. Our aim in this retrospective cohort study is to present the results of this procedure performed by surgeons familiar with spinal instrumentation.

**Method:** In this study, the data of 13 consecutive patients with spinopelvic instability between January 2019 and March 2023, who had pelvic ring injury with spinopelvic instability and who were emergently treated with anterior INFIX and posterior spinopelvic fixation, were retrospectively analyzed. Operation time, intraoperative blood loss, number of fluoroscopy images obtained, hospital stay duration, postoperative pain (VAS), need for secondary surgery (revision, infection, implant removal), mobilization time and complications (neurological deficit, infection, thromboembolic events, wound complications, death) were evaluated.

**Results:** A total amount of 13 patients (7 females, 6 males, mean age=42,6 (20-71) ) were included in this study. Mean follow-up period was 9 months (2-38 months). The mean operation time of anterior INFIX was 34.2 (25-40) minutes, the mean operation time for posterior spinopelvic fixation was 68.7 (54-88) minutes, the total operation time was 123.8 (109-139) minutes. Mean intraoperative blood loss was 378 (210-760) ml, fluoroscopy usage is 4.2 (2-7) shots, average hospital stay was 8.3 (3-21) days. Mean postoperative VAS score of the patients was 3.2 (2-7). Patients were allowed weight bearing as tolerated at an average of 34 (30-48) hours. There was no neurological deficit, thromboembolic event or death in any patient. No patient underwent revision surgery. INFIX was removed in 4 patients due to prominent hardware. Repeated debridements and antibiotic cement were applied in 3 patients with suspicion of posterior deep infection with one removal of implants due to infection. 4 patients had serous discharge at the posterior wound site that resolved with follow-up. No wound infection was observed in the anterior surgical area in any patient.



**S-059**

58 yo male patient with spinopelvic fixation and INFIX combined



**Conclusion:** Intervention of pelvic ring injuries with anterior INFIX and posterior spinopelvic fixation is a safe and effective method with easy positioning, fast surgical intervention, low fluoroscopy exposure and low complication rates. With this method, pelvic ring injuries can be treated quickly and effectively by surgeons familiar with the instrumentation of spine surgery. However, it should be kept in mind that rate of wound site discharge may be high in the posterior spinopelvic instrumentation site, consistent with previous studies.

**Keywords:** INFIX, Spinopelvic Fixation, Pelvic Ring Injury



**S-060**

## **EFFECT OF IRRIGATION WITH SALINE OF THE VERTEBRAL BODY BEFORE CEMENTING ON POSTOP PULMONARY ARTERY PRESSURE IN VERTEBROPLASTY**

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<sup>1</sup>Istanbul Medipol University Mega Hospital Orthopedics and traumatology

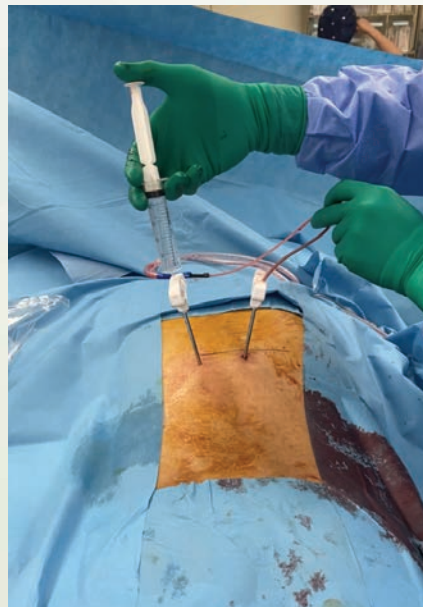
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<sup>3</sup>Medipol University Esenler Hospital

**Aim:** Vertebral compression fractures are more common with osteoporosis, but they can also be seen with pathologies such as malignant tumor metastases. Percutaneous vertebroplasty is a safe and less invasive treatment for both osteoporotic and metastatic vertebral fractures in patients of all age groups, and enables early mobilization for patients. A “wash-out” method has been described to reduce the resistance forces to cement injection, improve the distribution of cement, and reduce the risk of possible cardiovascular events. A similar method was also used in metastatic compression fractures to reduce the tumoral load on the vertebra to be injected. Our aim in this study is to evaluate the effect of saline irrigation method on pulmonary artery pressure in patients who underwent percutaneous vertebroplasty.

**Method:** 36 patients (15 Males, 21 Females) who were operated for vertebral compression fractures between 2018 and 2023 were included in the study. While the etiology was osteoporosis in 22 of the patients, the other 14 patients were metastases of different malignancies. In these cases, vertebroplasty cannula was placed on the fractured vertebra from both pedicles first, and the vertebral body was irrigated with saline before the cement was sent, and then cement injection was performed under fluoroscopy. Preop-postop VAS scores, d-dimer level changes, pulmonary artery pressure changes, and complication rates of the patients were recorded

irrigation with saline in vertebroplasty





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**Results:** Vertebroplasty was performed to an average of 2.3 levels in these patients. The mean d-dimer level was 1573 before the procedure and 2592 after the procedure, and the increase was statistically significant ( $p<0.001$ ). While the mean pre-procedural VAS score was 8.2, the mean post-procedure VAS score was 2.2 at the 24th hour. In the second week, it was found to be 0.19. The decrease in VAS score was found to be statistically significant. While the mean pulmonary artery pressure was 29 before the procedure, it was 29.95 after the procedure, and this change was not statistically significant ( $p:0.066$ ). Foraminal cement leakage was found in one patient, paravertebral venous cement leakage was found in one patient, and cement leakage into the disc was detected in one patient, but the patients were asymptomatic. No complications were observed in the follow-up of the other patients.

**Conclusion:** Vertebroplasty with wash-out technique; It is seen as an effective, safe and low major complication rate surgical option. Studies with larger patient participation and control groups are required for this newly defined method in the literature.

**Keywords:** Vertebroplasty, wash-out, compression fracture, osteoporosis



## S-061

### IS CRANIOCERVICAL JUNCTION AFFECTED AFTER SURGERY IN PEDIATRIC IDIOPATHIC SCOLIOSIS?

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**Aim:** It is not known exactly whether the craniocervical junction (CSJ) differs after surgery in pediatric (juvenile and adolescent) idiopathic scoliosis (IS). It was aimed to investigate the effect of IS surgery on CSJ.

**Method:** The patients who underwent spinal CT examination including CSJ before and after scoliosis surgery, those who underwent CT for preoperative, postoperative and other reasons without spinal problems were considered as the control group. Basion-axial interval (BAI), basion-dens interval (BDI), posterior atlantodental interval (PADI), anterior atlantodental interval (ADI), atlanto-occipital interval (AOI) and Powers ratio measurements were performed on CT. The groups were compared with each other to evaluate the effect of scoliosis surgery on CSJ.

**Results:** Posterior instrumentation and fusion surgery were performed on 79 pediatric patients (60 females, 19 males) operated for IS. 100 cases (50% women) without spinal problems were considered as the control group. The mean age in the IS group was 13.8 (6-18) years, and the mean age in the control group was 12.8 (6-18) years. When the measurements of all three groups were compared, no significant difference was observed in AOI, but a significant change was observed in BDI. While there was no difference between BAI, Power Ratio and PADI only in the postoperative-control group, the difference was significant in the other groups. While ADI preop-postop was not different, a significant difference was found between the other groups (Table 1).

Table 1

	Preop AIS (n=79)	Postop AIS (n=79)	Control (n=100)	Preop-Postop P	Preop-Control P	Postop-Control P
Gender****	F=60, M=19	F=60, M=19	F=50, M=50			
Age(years)	13.861 (6-18)	13.861 (6-18)	12.82 (6-18)			
BAI(mm)	6.99 (3-12.9)	7.3 (3.3-13.3)	8 (5.3-10.7)	<0.001	<0.001	0.076
BDI(mm)	4.146 (1.4-7.5)	4.47 (3.55-5.35)***	3.881 (3.52-4.08)***	<0.001	<0.001**	<0.001**
Power Ratio	0.716 (0.59-0.89)	0.727 (0.62-0.85)	0.74 (0.69-0.79)	<0.001	<0.001	0.079
ADI(mm)	1.714 (0.7-2.8)	1.629 (0.7-2.8)	2.319 (1-4.4)	0.142	<0.001	<0.001
PADI(mm)	15.587 (11-22.6)	17.496 (9.4-25.6)	16.88 (13.4-20.3)	<0.001	<0.001	0.213
AOI(mm)	1.9 (1.5-2.45)***	1.8 (1.4-2.7)***	1.8 (1.40-2.20)***	0.419*	0.175**	0.223**

\*Wilcoxon Signed Rank Test, \*\*Mann-Whitney U Test, \*\*\*Median(1st Qt - 3rd Qt) due to nonnormal distribution, whereas others are mean(min-max), \*\*\*\*F=Female, M=Male



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**Conclusion:** It was determined that craniocervical region measurements differed significantly from the control group except AOI and ADI in pediatric IS, and surgical treatment affected CSJ. It was considered important to evaluate the CSJ while planning the surgical treatment of IS.

**Keywords:** Basion-axial interval, Computed tomography, Idiopathic scoliosis, Craniocervical junction, Basion-dens interval



S-062

## CLINICAL CONFLICTS BETWEEN CERVICAL DISC HERNIATIONS AND ROTATOR CUFF DISEASES

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**Aim:** Shoulder and arm pain is an important group of patients complaints in neurosurgery clinics. In these patients whom we have evaluated with preliminary diagnoses of cervical pathology, there is often no reason to explain the pathology. Our aim with our case series is to determine which pathology is more common and to examine the details that can guide us in terms of treatment.

**Method:** In our study, patients ; who were older than 18 years old who applied to the neurosurgery clinic of our hospital between november 2022 and january 2023 and who had palpitation sensitivity in the shoulder joint were included in the foreground although there were arm complaints. Radiologic images of the patients were retrospectively scanned and cervical MRI and shoulder MRI tests were examined. 152 patients who meet all these conditions have been identified. demographic, clinical and radiological characteristics of the patients were grouped and detailed.

**Results:** When 152 patients were evaluated, the combination of cervical disc herniations and shoulder joint pathologies was noteworthy. 68 (44.7%) patients were accompanied by various pathologies such as edema in the shoulder joint and rotator cuff tear in addition to cervical pathology. Isolated cervical disc degeneration patterns were observed in the remaining 46 (30.2%) patients, while only shoulder pathology was detected in 21 patients, clinical incompatibility with imaging tests in 19 (12.5%) patients. The mean age of the patients was 46 years. When the gender distribution was examined, 88 (57%) female , 64 (43%) male patients were admitted.

**Conclusion:** In this study, we have determined that rotator cuff diseases are a pathology that significantly accompanies cervical disc pathologies in clinical evaluation .Multicenter studies covering a wide range of studies are needed ,in terms of the necessity of adding shoulder MRI to routine imaging tests or the development of new protocols related to the subject, especially in cases with painful shoulder movements.

**Keywords:** shoulder, cervical, disc, herniation, impingement



**S-063**

## COMPARISON OF POSTERIOR 2 ROD INSTRUMENTATION WITH 3 ROD INSTRUMENTATION IN CORRECTIVE SPINE FUSION PROCEDURES AND RISK FOR MECHANICAL FAILURE

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**Aim:** Surgical treatment of degenerative spine diseases is considered if conservative treatment fails. Indications for instrumented fusion include severe pain and trunk imbalance, which can enhance quality of life over time. Techniques for 3-rod instrumentation have recently been described. In comparison to 2-rod instrumentation, we hypothesize that 3-rod instrumentation combined with spine fusion procedures may reduce the risk of postoperative loss of correction, the rates of pseudarthrosis, rod failure, non-union, and revision surgery. The purpose of this study was to compare clinical results, sagittal alignment and mechanical complications with both techniques.

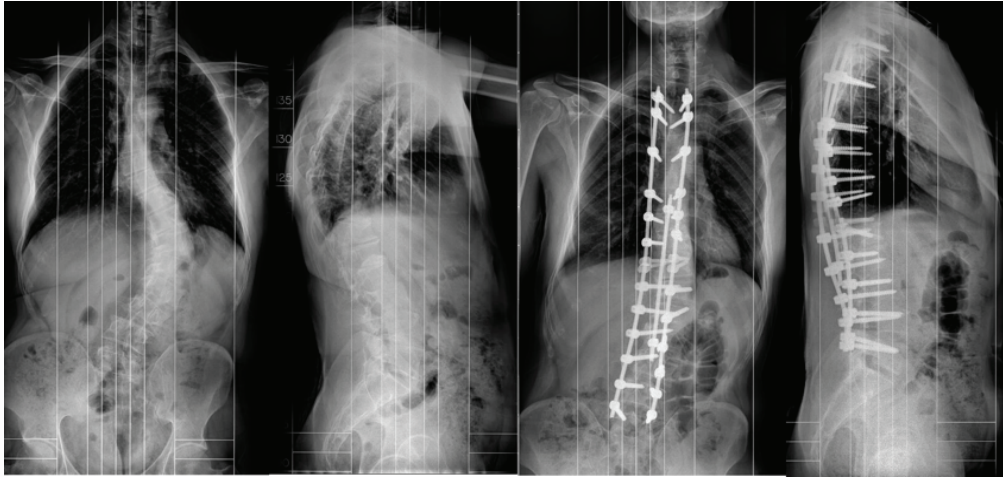
**Method:** A retrospective review of patients who had corrective spine fusion procedures at a single center between the years of 2015-2020 was done with a minimum follow-up of three years. This study includes 2 groups. Both group1 (two-rod instrumentation) and group2 (three-rod instrumentation) have a total of 30 patients. A convex lamina hook system was separately added to the bilateral pedicle screws in group2. Indications were similar in both groups and patients were operated by the same surgeons. Clinical scores (VAS, ODI) were systematically submitted to the patients preoperatively, postoperatively (6 weeks–3 months), at 1 year and last follow-up. Following scores were analysed: visual analogic scale (VAS) for back and leg pain, Oswestry disability index (ODI). Full spine radiographs were analysed in 60 patients. The data were then compared statistically.

**Results:** In this study, 3-rod instrumentation, as opposed to 2-rod instrumentation, reduced lordosis loss. In the group1 lumbar lordosis increased to 52.8° postoperatively and decreased to 47.0° at follow-up. In the group2, lumbar lordosis increased from 54.3° postoperatively and remained at 53.2°. Proximal junctional kyphosis is another prevalent issue (PJK). It has several different underlying causes. 13.3% in group1 and 15.4% in group2 both had a similar incidence of PJK. This clinical investigation shows that using three rods reduces the risk of pseudoarthrosis and does not require revision surgery for rod fractures. With the exception of pseudoarthrosis and rod fracture, both major and minor problems were statistically similar between the two groups postoperatively for these regional sagittal alignment assessments.



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### 3-rod instrumentation



An X-ray of the patient in our study who had 3-rod instrumentation

**Conclusion:** Early rod failures, nonunions, infections, and the degree of correction were all quantitatively assessed and compared between the 3-rod technique and the conventional 2-rod technique in our study. The use of supplemental rods is intended to reduce mechanical stress on primary rods. They aim to lower primary rod tension to reduce the risk of non-union and rod fracture. In summary, this study compares two procedures that may help to lower the rates of pseudoarthrosis and rod failure. It will be important to confirm these findings in a prospectively designed study with multiple institutions in order to better control for potentially confounding factors.

**Keywords:** Sagittal alignment, 3-rod technique, Degenerative spinal deformity, Non-union, Proximal junctional kyphosis



**S-064**

## APPROACH TO POSTTRAUMATIC SPINAL ARACHNOID CYSTS IN TRAUMATIC VERTEBRA FRACTURE TREATMENTS

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<sup>1</sup>Gaziantep Dr Ersin Arslan Training and Research Hospital

**Aim:** In spinal traumas, neuromotor deficits are observed under the lesion level due to spinal instability and spinal cord compression. Decompression by removing bone fragments and providing spinal stability is sometimes not sufficient for the improvement of neuromotor deficits. This is also caused by the occurrence of spinal cord damage or the presence of a posttraumatic spinal arachnoid cyst. Although there is no additional surgical intervention for spinal cord damage, the drain of posttraumatic spinal arachnoid cysts may contribute to the improvement of neuromotor deficits. In our declaration, we examined the results of spinal arachnoid cyst drainage in patients with surgery and neuromotor deficits due to traumatic spinal injury, although intradural pathology was not detected in radiological examinations.

**Method:** During the post-traumatic spinal surgery, the data of patients with spinal arachnoid cyst drainage after dura mater opening are given in the Table. After the paravertebral muscles were stripped and facet joints were presented, decompression and stabilization were performed for spinal vertebrae. Afterward, the dura mater was opened as linear at the lesion level and the arachnoid cyst was revealed. The posterior membrane of the arachnoid cyst in the field was opened. The content of the arachnoid cyst was drained. Dura Mater Watertight was closed.

Posttraumatic spinal arachnoid cyst



Posttraumatic spinal arachnoid cyst was showed



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Spinal arahnoid cyst's drainage

	Female	Male	Total
Patient's number	16	12	28
The average age	28	43	34
Thoracic vertebrae fracture	12	6	18
Lumbal vertebrae fracture	4	6	10
NMD improvement in the early period	14	8	22
NMD improvement in the late period	2	3	5
Postoperative CSF fistule surgery	0	1	1

Patients with traumatic spinal injury and with neuromotor deficitis (NMD) and with intraoperative spinal arahnoid cyst drainage are given.

**Results:** In our neurosurgical clinic, we performed spinal arahnoid cyst drainage in 28 patients. No intradural pathology was detected in radiological examinations. The patients with thoracolumbar spinal fracture diagnosis were performed posterior decompression and stabilization of the spine and all patients had a different degree of neuromotor deficits before surgery. Depending on the method subject to the declaration, we followed different rates of improvement in the neuromotor deficits of 22 cases. Full improvement was achieved in the neuromotor deficits of 18 patients. In 5 patients, neuromotor deficits were improved in the first 6 months after physical therapy. No-improved in the neuromotor deficit of one patient was observed in the late period.

**Conclusion:** In these patients, the drainage of arahnoid cysts by opening the dura mater contributes to the reduction of morbidity.

**Keywords:** Spinal arahnoid cysts, Vertebrae fracture, Neuromotor deficitis, Traumatic spinal injury, Opening dura mater



**S-065**

## TRANSFORAMINAL INJECTION TREATMENT OF LUMBAR DISC HERNIATION: PLATELET-RICH PLASMA VERSUS STEROID WITH PLATELET-RICH PLASMA

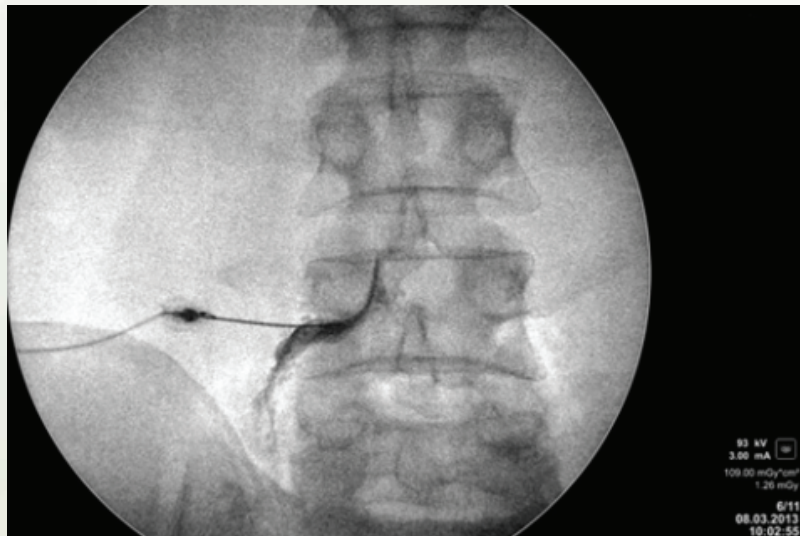
Mehmet Fatih Aksay<sup>1</sup>, Ali Can ÇİÇEK<sup>1</sup>

<sup>1</sup>Ağrı Education and Research Hospital

**Aim:** Transforaminal steroid injection is widely used in the treatment of lumbar disc herniation. However, due to the narrow usage range of the steroid and the high negative effects, there are problems in its use. The effect of platelet-rich plasma (PRP), which is widely used and contains high amounts of growth factors and cytokines, with anti-inflammatory, anti-apoptotic and proliferative effects on radicular pain remains unclear. The aim of this study is to compare the clinical positive and negative effects of transforaminal PRP and steroid-PRP combination injections under the guidance of fluoroscopy in patients with radicular pain due to lumbar disc herniation.

**Method:** In the study, PRP (n = 30) or combined injection therapy (n = 32) was applied to a total of 62 patients, aged 20-60 years, diagnosed with CT or MRI and admitted to the orthopedics and traumatology clinic due to lumbar disc herniation, in the form of transforaminal under the guidance of fluoroscopy. Patients 1 week before and 1 week, 6 months after the procedure, visual analog scale (VAS), pressure pain thresholds (PPT), Oswestry disability index (ODI), physical function (PF), bodily pain (BP) domains with SF-36 evaluated according to the scoring.

Transforaminal Injection



Transforaminal Injection Treatment of Lumbar Disc Herniation



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**Results:** There was no statistical difference between the two groups in terms of age and gender ( $P > 0.05$ ). In both groups, VAS (median 7.3 – 6 months after the procedure) evaluated 1 week before and 6 months after the procedure (median 7.3  $p < 0.01$  after 1 week), PPT (median 570.50 before 1 week - 6 months after the procedure 706.40  $p < 0.01$ ), ODI (median 34.30% before 1 week – 21.20% after 6 months  $p < 0.01$ ), SF-36 (median PF 62.00 1 week before, BP 43.00 – PF 87.00 after 6 months), BP 54.00  $p < 0.01$ ,  $p < 0.01$ ) scores improved significantly. While there was a significant difference in all scores 1 week before and 1 week after the procedure in the combined injection group, there was no significant difference in only the PRP group. There was no significant difference in scoring between the two groups at 6 months after the procedure. No adverse effects were observed in either group.

Demographic characteristics and baseline information of patients before 1 week.

	Combined group	PRP group	p
Age (y, median)	54,0	55,0	0,9
Gender ( N, Female)	13	14	0,145
VAS ( median)	7.3	7.3	0,108
PPT ( kPa, median)	570,50	580,30	0,74
ODI (% , median)	34,30	36,40	0,482
PF of SF-36 ( median)	62,00	60,00	0,88
BP of SF-36 ( median)	43,00	41,00	0,396

Demographic characteristics and baseline information of patients before 1 week.

**Conclusion:** This study suggests that in the treatment of radicular painful lumbar disc herniation, transforaminal PRP and Steroid-PRP injections administered with scopy have similar long-term effects, and combined injection therapy may be a more effective alternative treatment method when compared in the short-term.

**Keywords:** Transforaminal Injection, Steroid, Platelet-Rich Plasma, Lumbar Disc Herniation, radicular painful



S-066

## THE EFFECT OF BLOOD PRESSURE VALUE ON INTRAOPERATIVE IMAGING IN BIPORTAL ENDOSCOPIC SPINE SURGERY

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**Aim:** Degenerative lumbar spinal stenosis (DLSS) is a common cause of low back pain in the elderly population. Unilateral biportal endoscopic (UBE) decompression is an approach that causes a wound smaller than 1 cm in minimally invasive surgical techniques, thus minimal postoperative wound pain, less pain, less hospital stay and preventing atrophy in the paraspinal muscles. The aim of our study is to investigate the relationship between vision and blood pressure during tube decompression in patients with lumbar spinal stenosis and to clarify the optimal blood pressure to maintain good visualization during surgery.

**Method:** At the beginning of UBE, during laminectomy and during foraminotomy, 3 consecutive blood pressure measurements were taken with 2-minute intervals, and the patient's systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) were recorded. The mean of these consecutive measurements was taken to determine the SBP, DBP, and MAP of these surgical stages. Simultaneously, the first surgeon and the assistant surgeon were asked to evaluate the image quality. Surgeons evaluated the image quality independent of blood pressure values and each other, as 4 best and 1 worst. Stages 4 and 3 were evaluated as good images for surgery, and Stages 2 and 1 were evaluated as bad images for surgery.

**Results:** Forty-five patients (25 females, 20 males) with a mean age of 66.88 (min:52-max:81) who were scheduled for UBE surgery due to lumbar stenosis were included. The mean blood pressure values of the good (stage 4-3) and bad (stage 2-1) image groups at the surgical stages were compared. When the mean SBP, DBP and MAP values of the good image group were compared with the mean values of the bad image group at the beginning of UBE and at the foraminotomy stage, no statistical difference was observed ( $p=0.29/0.10/0.26$ ), ( $p=0.96/0.07/0.22$ ). When the mean SBP and MAP values of the good image group were compared with the mean values of the poor image group at the laminectomy stage, no statistical difference was observed ( $p=0.42/0.05$ ) (table 1). However, there was a statistically significant difference between the mean DBP between the groups ( $p=0.02$ ). ROC analysis was performed and the cut-off value was found to be 106.34 mm Hg for SBP.



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Table 1: monitoring clarity and blood pressure values during surgical stages

Sur- gical Stages	Good monitoring group						Bad monitoring group						P		
	4			3			2			1					
	SBP(SD)	DB- P(SD)	MAP(SD)	SB- P(SD)	DBP(SD)	MAP(SD)	SBP(SD)	DB- P(SD)	MAP(SD)	SB- P(SD)	DB- P(SD)	MAP(SD)	SBP	DBP	MAP
Begin- ning of UBE	102.78 (18.16)	62.11 (10.60)	76.11 (12.75)	107.99 (7.19)	65.05 (9.68)	81.70 (7.22)	113.75 (10.14)	75.50 (9.68)	88.42 (8.95)	113.67 (11.79)	72.67 (8.49)	87.17 (7.79)	0.29	0.10	0.26
Lami- nec- tomy time	94.78 (11.35)	55.98 (7.43)	70.82 (8.20)	99.73 (8.94)	62.25 (6.0)	77.02 (6.05)	95.17 (8.71)	55.25 (8.78)	70.67 (8.07)	101.67	64	77	0.42	0.02*	0.05
Forami- natomy time	99.5 (15.21)	53.5 (6.14)	69.87 (7.49)	100.47 (9.77)	59.42 (6.70)	75.11 (5.93)	99.85 (17.08)	54.70 (10.44)	73.5 (13.13)	104.5 (24.75)	66.0 (16.97)	82.34 (20.27)	0.96	0.07	0.22

**Conclusion:** UBE decompression monitoring clarity is correlated with patient blood pressure. Keeping the systolic blood pressure below 106 mmHg ensures good monitoring clarity, without posing a risk to the patient during the surgery.

**Keywords:** UBE, Monitoring, Blood pressure



S-067

## ANALYSIS OF THE QUALITY, RELIABILITY AND EDUCATIONAL CONTENT OF YOUTUBE VIDEOS ON UNILATERAL BIPORTAL ENDOSCOPIC SPINE SURGERY

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**Aim:** The aim of this study was to evaluate the quality and reliability of UBE spinal surgery videos on YouTube.

**Method:** This was a cross-sectional study. In February on 2023, an online search was performed on YouTube using the statement “unilateral biportal endoscopic (UBE) spine surgery”. The popularity of videos was assessed with Video Power Index (VPI), the technical and educational quality, and the reliability of videos were measured using the Global Quality Scale (GQS), the Journal of American Medical Association (JAMA) benchmark criteria, and modified DISCERN instrument

**Results:** Ninety-three videos were included for evaluation. Technical characteristics of videos are given in Table 1. The video uploader profiles were analyzed according to their continents and found that 57 (61.3%) were from Asia, 33 (35.5%) were from the USA, 2 (2.2%) were from Africa and 1 (1.1%) was from Australia. If the features of the videos are analyzed by dividing into two groups as those uploaded from Asia and from other continents, it was found that there was no significant difference in terms of the number of likes and dislikes, total number of views, video duration, upload time, daily viewing rate, video popularity, quality and reliability of the videos; however, the educational quality of the videos was higher in those uploaded from except of Asia (Table 2). When the relationship between the image quality, reliability, educational quality and technical features of the videos is evaluated, a positive correlation was found between the number of likes and dislikes and the popularity of the video; video duration and video reliability and also total number of views and daily viewing rate and video reliability. However, there was a negative correlation between the total number of views and daily viewing rate and video quality, and also between upload time and video quality, reliability and content quality (Table 3). When the videos were divided into two groups as low-medium and high quality according to their educational quality, it was determined that there was a significant difference between video duration, loading time, video quality and reliability ( $p < 0.001$ ).

**Conclusion:** Most of the YouTube videos on UBE spine surgery were added by spine surgery professionals. Therefore, the reliability, quality, and educational content of YouTube videos on UBE spine

**Keywords:** spine, Unilateral biportal endoscopic spine surgery



S-068

## THE EFFECT OF CLINICAL AND RADIOLOGICAL PARAMETERS ON QUALITY OF LIFE IN UNTREATED ADOLESCENT IDIOPATHIC PATIENTS IN ADULTHOOD

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**Aim:** Several studies investigated health-related quality of life (HRQoL) of untreated AIS patients in adulthood and demonstrated comparable results to control groups. The aim of this study is to evaluate the factors that affect HRQoL in untreated AIS patients in the adulthood. We investigate the effect of clinical and radiological parameters to the SRS-22 results of these patients.

**Method:** This prospective single-center cross-sectional study was reviewed and approved by our institutional review board (2021/113). Untreated AIS patients at adult age between April 2021 and April 2022 who admitted to our clinic were included in the study. Postural disturbances, coronal plane deformities under 10°, and Patients with congenital, neuromuscular, or other secondary scoliosis were excluded from the study and a total of 286 patients (194 female, 92 male) enrolled. Age, gender, occupation, weight, height of the patients were recorded and body mass index (BMI) was calculated for all patients. Clinically rotational deformities were evaluated with scoliometer both in thoracic and lumbar region. Radiologically Cobb angles, coronal balance, clavicle angle, pelvic tilt, trunk shift, and apical vertebral translation were measured in standing anteroposterior x-rays. Since Lenke classification cannot be applied to the minor curves, the patients were divided into three groups as thoracic (MT), lumbar/thoracolumbar (LTL), and double curves (DM) according to the gibbosity measurement region with scoliometer. The effect of each parameter on SRS-22 results were evaluated.

**Results:** No correlation was found between gender, age, curve type, presence of gibbosity or diagnosis time, and SRS-22 scores. A negative correlation was found between the BMI of the patients and the SRS-22 self-image scores ( $r=-0.246$   $p<0.01$ ) and function scores ( $r=-0.193$   $p<0.05$ ). Although we found no correlation between age and SRS-22 results, self-image scores were decreased as the duration that patients knows he or she has scoliosis increased. MT gibbosity was found to negatively correlate with self-image and total SRS-22 scores. Also, negative correlations between LTL gibbosity and function, pain scores were found. No correlations were found for other SRS-22 subscores. MT Cobb angle magnitude was negatively correlated with self-image, mental health, and total SRS-22 scores. There were negative correlations between clavicle angle and mental health score, between coronal pelvic tilt and self-image score, between apical vertebral translation and pain score. Trunk shift had no effect on SRS-22 scores.

**Conclusion:** BMI, MT gibbosity, LTL gibbosity, MT Cobb angle, clavicle angle, coronal pelvic tilt, apical vertebral translation were negatively correlated with SRS-22 domains in untreated AIS patients in adulthood.

**Keywords:** health related quality of life, Adolescent Idiopathic Scoliosis, adulthood, outcome



S-069

## UNTREATED UNILATERAL HIP DISLOCATION ASSOCIATED WITH CEREBRAL PALSY SCOLIOSIS.

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**Aim:** The presence of a unilateral hip dislocation in children with cerebral palsy (CP) may cause problems with sitting imbalance, pressure ulcers, and hip pain. There is a dynamic interplay between hip dislocation, pelvic obliquity (PO), and scoliosis. The effect of an untreated unilateral hip dislocation on the rate of curve progression of CP scoliosis has not been well defined in the literature. The purpose of these cases is to investigate the severity of unilateral hip dislocation with scoliosis in cerebral palsy.

**Method:** Patients with spastic quadriplegic CP who had spine radiographs at the time of initial presentation with scoliosis and at the latest follow-up were evaluated. Three children with spastic CP who had an untreated unilateral hip dislocation and scoliosis constituted the study.

**Results:** The mean ages of patients were 16 (12-20) years (2 female 3 male). The mean follow-up was 28 months. The mean scoliosis curve was 105.6 degrees (95-111degrees) preoperatively, and decreased to 43 degrees (13-60 degrees). Brace was used nearly 6 months after surgery till fusion. There were no any intraoperative and postoperative complication.

**Conclusion:** Unilateral hip dislocation causes a significant increase of pelvic obliquity and increase scoliosis deformity progression. Posterior alone surgery can correct coronal imbalance

**Keywords:** scoliosis, neuromuscular scoliosis, cerebral palsy



S-070

## ADAPTATION AND VALIDATION OF THE TURKISH VERSION OF THE QUALITY OF LIFE PROFILE FOR SPINAL DEFORMITIES IN IDIOPATHIC SCOLIOSIS

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**Aim:** The Quality of Life Profile for Spinal Deformities (QLPSD) was developed to evaluate the quality of life of patients with scoliosis and other spinal deformities the purpose of the study was to translate the QLPSD into Turkish systematically and to examine the reliability and validity of the Turkish version.

**Method:** This methodological study was conducted with 125 participants with idiopathic scoliosis. After the translation of the QLPSD into Turkish systematically, all participants were answered the Turkish version of the QLPSD (T-QLPSD) and SRS-22 questionnaires. Intraclass correlation coefficient (ICC) and Cronbach's alpha statistics were calculated for reliability, exploratory factorial analysis and construct validity were calculated for validation.

**Results:** 125 participants were included in the study. The mean age of them was  $13.7 \pm 2.2$  years. For the T-QLPSD total score, Cronbach's alpha was 0.91, and the ICC was 0.94. A strong correlation was found between T-QLPSD and SRS-22 total scores ( $r = -0.705$ ). Participants with mild scoliosis reported less back pain, better back flexibility and body image compared to moderate scoliosis.

**Conclusion:** The T-QLPSD was found to be a reliable and valid scale for assessing quality of life for idiopathic scoliotic patients in Turkey.

**Keywords:** Quality of life, Reliability, Scoliosis, Turkish, Validity



S-071

## CASES OF FACET DISLOCATION AFTER CERVICAL TRAUMA: OUR CLINICAL EXPERIENCES

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**Aim:** Today, as a result of the advancement of technology and the increase in the use of motor vehicles, spinal injuries have become a common situation. Cervical injuries occur as a result of sudden acceleration-deceleration movements of the head. The current and recently widely used classification for neurological evaluation is the ASIA classification, which includes motor and sensory losses and disability rates related to them. The surgical decision is made depending on the ligament and bone damage. The primary goal in surgery is to completely preserve the neural structures. In this study, we examined the management of 12 patients with cervical fractures who applied to SBU Bozyaka Hospital between the years 2019-2022, and the patients with facet dislocation.

**Method:** Cases with facet dislocation after cervical trauma between the years 2019-2022 were included. The patients were examined in terms of age, gender, etiology, clinic, prognosis, treatment approach, and surgical timing.

**Results:** Nine of the patients were male and 3 were female. Ages ranged from 27 to 64. 8 cases were admitted to our hospital after non-vehicle traffic accidents, 3 cases after falling from height, and 1 case after assault. According to the admission clinic, 2 cases were ASIA C, 3 cases were ASIA D, and 7 cases were ASIA E. Five patients with deficits at the time of admission to the hospital were operated on the same day, and the other 7 patients were operated within two days. Of these, 6 cases were treated with posterior, 2 cases anterior, and 4 cases with anterior and posterior combined approach. Traumatic cervical disc herniation was present in two patients who were operated anteriorly.

**Conclusion:** The presence of acute cervical disc herniation and the condition of the posterior ligament complex are important in the surgical treatment approach. In the patient with traumatic cervical disc herniation, the anterior approach should be applied first, and if it is insufficient, additional posterior reduction is recommended. In our clinic, we performed only anterior surgery in 2 of 4 cases with traumatic disc and both anterior and posterior surgery in the other 2 cases. If there is no acute disc herniation, direct posterior reduction is recommended. We performed reduction with only posterior approach in 6 of our cases. We provided reduction with anterior-posterior approach in 2 cases with posterior ligament damage. As a result, the clinical and radiological imaging of the patient are shown to be decisive in the treatment approaches.

**Keywords:** Cervical dislocation, cervical trauma, facet dislocation



S-072

## FUSION LEVEL IN THE SURGICAL TREATMENT OF UNSTABLE TRACOLOMBER VERTEBRA FRACTURES; SHORT SEGMENT OR LONG SEGMENT?

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**Aim:** There is some debate as to which is the best approach for the surgical treatment of unstable thoracolumbar vertebral fractures. The aim of this study is to compare the results of short segment and long segment fusion in the surgical treatment of unstable thoracolumbar vertebral fractures.

**Method:** Ninety-one patients with unstable T11-L2 burst fractures operated between January 2014 and March 2021 were included in the study. The patients were divided into two groups as those who underwent long segment fusion (group A: n: 55, age: 40.3) and those who underwent short segment fusion (group B: n: 36, age: 39.7). All patients were followed up periodically with clinical and radiological evaluation. Vertebral compression angle (VCA), vertebral corpus height (VCH), intraoperative parameters and complications were compared between the groups.

**Results:** There was no statistical difference with respect to age, sex, level of injury, AO classification, mechanism of injury and ASIA (American Spinal Cord Injury Association) classification between the groups. Improvement in early postoperative VCA was statistically significantly better in Group A ( $p=0.0025$ ). At the last follow-up, postoperative VCA correction was significantly more successful in group A ( $p=0.0009$ ). There was no difference between the two groups in terms of correction loss in VCA measured at the last follow-up. There was no statistically significant difference between the two groups in terms of postoperative VCH, VCH at the last follow-up, and correction loss in VCH. There was no difference between the two groups in terms of postoperative Denis pain scale scale.

**Conclusion:** Although long segment fusion provides better postoperative correction of the fractured vertebra than short segment fusion, there is no difference between the two groups in terms of loss of correction in the follow-up. Short segment fusion is as effective as long segment fusion in the treatment of unstable thoracolumbar vertebral fractures.

**Keywords:** Thoracolumbar fractures, long segment fixation, short segment fixation, fracture level.



S-073

## ASSESSING SAGGITAL BALANCE MEASUREMENT IN PATIENTS UNDERGOING POSTERIOR SEGMENTAL INSTRUMENTATION:A COMPARISON OF PEEK RODS AND TITANIUM RODS

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**Aim:** The aim of this study was to compare the sagittal balance measurements in patients who underwent posterior segmental instrumentation using PEEK (polyetheretherketone) rods and those using titanium rods, in order to evaluate the degree of improvement.

**Method:** In this prospective study, preoperative and postoperative radiographs of patients who underwent posterior segmental instrumentation at Ankara Bilkent City Hospital between 2019 and 2023 were evaluated. Measurements were made using Surgimap Spine Software.

**Results:** The first group of 19 patients (10 female and 9 male) with an age range of 21-84 who used PEEK rods, while the second group of 19 patients (10 female and 9 male) with an age range of 18-85 who used titanium rods. The average lumbar lordosis (LL) angle was 43 preoperatively and 46 postoperatively in patients who used PEEK rods, and 44 preoperatively and 48 postoperatively in those who used titanium rods. In patients who used PEEK rods, the sacral slope (SS) averaged from 32 to 36, and pelvic tilt (PT) ranged from 24 to 26 on average. In patients using titanium rods, the sacral slope changed from 34 to 31 on average, and pelvic tilt changed from 25 to 29 on average (Table 1).

Table 1: Average of Titanium rods and PEEK rods preoperative /postoperative measurements

	PEEK ROD PREOP	PEEK ROD POSTOP	TİTANİUM ROD PREOP	TİTANİUM ROD POSTOP
LL	43	46	44	48
SS	32	36	34	31
PT	24	26	25	29

**Conclusion:** There was no significant difference in the change of sagittal balance measurements between PEEK rods and titanium rods used in patients with posterior segmental instrumentation.

**Keywords:** PEEK (polyetheretherketone) rods, titanium rods, sagittal balance



S-074

## COMPARISON OF UNILATERAL DYNAMIC STABILIZATION AND BILATERAL DYNAMIC STABILIZATION IN SHORT SEGMENT SPINAL PATHOLOGIES

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**Aim:** To treat the unstable spine, fusion operations by using transpedicular screws and cages are commonly performed. To overcome the problems encountered with rigid fusion systems, dynamic systems with flexible pedicle screws and rods started to be used. Dynamic systems have several advantages over fusion systems. It controls the excessive movement of the unstable segment, distributes load and stress more equally and thus, prevents the degeneration of the adjacent segment. Postoperative long-term results of patients who were fixed with a unilateral dynamic transpedicular screw system and patients who were fixed with a bilateral dynamic transpedicular screw system in different spinal pathologies were examined.

**Method:** 43 patients operated in our clinic and stabilized with unilateral and bilateral transpedicular dynamic screw system were examined. Thirteen of these patients were diagnosed with foraminal stenosis, six with intradural extramedullary spinal tumor, seven with extraforaminal disc herniation, and seventeen with two-level foraminal stenosis. Patients with two-level foraminal stenosis were operated using a two-level dynamic pedicle screw system, and the rest were operated using a single-level dynamic pedicular screw system. Unilateral dynamic transpedicular screw system was used in 18 patients and bilateral dynamic transpedicular screw system was used in 25 patients. The preoperative and postoperative long-term clinical follow-ups of these patients were compared according to the visual analog pain scale (VAS) and Oswestry disability index (ODI) and using radiological instability criteria.

**Results:** The patients consisted of 26 (60.4%) males and 17 (39.6%) females with a mean age of  $39.13 \pm 14.11$  years (range 23–65 years). In the postoperative period, a statistically significant difference was found in the VAS and ODI scores ( $p < 0.001$ ). It was observed that there was no difference between the symptomatic and radiological criteria of both groups. Instrument failure was observed in 1 of 9 patients who underwent unilateral 2 levels of dynamic stabilization. Other patients did not require revision surgery. No significant difference was found between the two groups when compared in terms of complications. Superficial wound infection was detected in 1 patient, and subcutaneous hematoma was detected in 1 patient.

**Conclusion:** Long-term clinical and radiological results of unilateral dynamic stabilization systems and bilateral dynamic stabilization systems in short segment spinal pathologies were found to be similar.

**Keywords:** Dynamic systems, unilateral stabilization, transpedicular, dynamic screw



S-075

## COMPARISON OF SURGICAL TECHNIQUES AND LOCALIZATION IN OPERATED GIANT DISC HERNIATIONS

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**Aim:** Lumbar disc herniation can be classified radiologically, but there is no study that clearly expresses the size of disc herniation. The accepted general opinion; In order to be called massive organic disc hernia, there must be a disc herniation that covers more than half of the sagittal diameter of the lumbar spinal canal. Lumbar giant disc herniations operated in our clinic were examined according to their localization, surgical technique, preoperative and postoperative clinical findings of patients and surgical complications.

**Method:** Fifty patients who were operated for giant disc herniation between 2016 and 2023 were retrospectively analyzed. Patients with listesis and/or lumbar stenosis were not included in the study. MRI was used as the diagnostic method.

**Results:** Thirty (60%) of the operated patients were male and 20 (40%) were female. The mean age was 48.32 (64%) had disc herniation at the L4-5 distance, while 11 (22%) had L5-S1, 4 (8%) had L3-4, 2 (4%) had L2-3 and 1 (2%) of them had disc herniation at L1-2 level. When the localizations of the disc herniation were evaluated on MR images, 18 (36%) median disc herniations, 18 (36%) left paramedian, and 14 (28%) right paramedian disc herniations were present. The mean duration of symptoms was 70 days. 26 (52%) patients had preoperative loss of muscle strength. These patients, 9 had median disc herniation, 9 had right paramedian, and 8 had left paramedian disc herniation. One patient had cauda equina syndrome. 10 patients had previous lumbar discectomy. When surgical treatment methods were evaluated, flavectomy and discectomy were performed in 2 patients. Partial hemilaminectomy and discectomy were performed in 24 patients. Lumbar stabilization was applied to 9 of the remaining 24 patients. As a complication, 2 patients had recurrence, 1 patient was hospitalized for wound infection.

**Conclusion:** Giant lumbar disc herniations present with a higher rate of deficit and more severe radicular pain. Because of these clinical features, the first treatment option is surgery. In the literature show that postoperative deficit recovery rates are satisfactory. In our patients, the improvement of the deficit in 22 (84%) of 26 patients with preoperative loss of muscle strength confirms this. The ultimate goal in disc herniation surgeries should be to provide adequate decompression. Each patient needs to be evaluated specifically and it should be kept in mind that the surgical technique can be changed if needed preoperatively.

**Keywords:** Giant Disc Hernia, Lomber



S-076

## THE EFFECT OF ASYMMETRICAL LOADING ON BONE DENSITY DISTRIBUTION IN ADOLESCENT IDIOPATHIC SCOLIOSIS CASES

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**Aim:** Load changes may cause different mechanical loads on the lower extremities in cases such as spinal deformities, leg heterometry, and pelvic obliquity. In Wolf's law, a decrease or increase in bone mass will occur as a result of the load applied to the bones (1). The proximal femoral bone density can be evaluated opportunistically using computerized tomography (CT) with the Hounsfield units (HU), which is correlated with dual-energy X-ray absorptiometry (DEXA) (4). The aim of this study is to analyze the bone density differences in both femoral neck regions in patients diagnosed with Adolescent Idiopathic Scoliosis (AIS), and to examine the relationship of this difference with scoliosis type, bilateral iliac-femoral head height difference and pelvic inclination.

**Method:** 46 AIS patients were included. Demographic data and Lenke curvature types were determined. CT/angio sequence via a DICOM viewer program, determining the triangle (wards) between the right and left proximal femoral trabecular bone structures, HU measurements from 1 cm<sup>2</sup> area (HU(RIGHT) and HU(LEFT)) was performed by two radiology and orthopedics residents. The height differences between both femoral heads and upper points of iliac wings, and inclination angle of the S1 upper end-plate were measured on the standing AP radiographs. Statistical significances were investigated.

**Results:** Data analyzed with SPSS 24.0 at 95% confidence level. In all cases, the main thoracic curvature was on the right and the thoracolumbar/lumbar curvature was on the left convex sides. HU (LEFT) values differed statistically significantly according to gender (p=0.048). HU (LEFT), HU (RIGHT), iliac wing and femoral head difference values did not differ statistically significantly according to Lenke types, lumbar and sagittal modifiers (p>0.05). Sacral inclination values differed significantly according to Lenke type and sagittal modifiers (p<0.05). Correlations were; Positive and strong between HU (LEFT) and HU (RIGHT), positive and moderately strong between HU (LEFT) and femoral head, positive and moderately strong between HU (RIGHT) and femoral head. A positive and strong correlation was found between the difference between the femoral head levels and the sacral inclination, and a positive and moderately strong correlation between the femoral head levels and the sacral inclination.

Table 1

	YAŞ	HU (SOL)	HU (SAĞ)	iliak kanat farkı mm	femur başı farkı mm	sakral eğim
YAŞ	1					
HU (SOL)	-0,036	1				
HU (SAĞ)	-0,095	,758**	1			
iliak kanat farkı mm	-0,287	0,265	0,277	1		
femur başı farkı mm	-0,141	,318*	,402**	,837**	1	
sakral eğim	-0,033	0,070	0,071	,632**	,574**	1



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The relationship between measurement values (correlation test)  $*p<0.05$   $**p<0.01$ : there is a significant relationship.

**Conclusion:** Vertebral column curvatures and differences in femoral head and iliac wing levels among pelvic coronal parameters do not affect the bone density of the femoral neck in AIS cases. However, as the sacral inclination increases, the difference in bone density increases. This may help clinicians consider restoring sacral plate level with such as shoe supports during treatments.

**Keywords:** Opportunistic bone density, Adolescent idiopathic scoliosis



S-077

## SELECTION OF LEVELS IN PATIENTS OVER 70 YEARS OF AGE WITH OSTEOPOROTIC CANAL STENOSIS

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<sup>1</sup>Gülhane Training And Research Hospital

**Aim:** Osteoporotic patients with canal stenosis are a group that is difficult to treat. Level selection is important in these patients. PJK is a common complication. The aim of this study is to determine the appropriate fusion level to minimize the likelihood of developing PJK in osteoporotic patients.

**Method:** Twenty patients over 70 years of age, who were operated on at Gülhane Training and Research Hospital between 2018 and 2022 and were followed up for at least 1 year in the post-op period, with a BMD below -2.5 were included in the study. Fusion level was applied as t8 s1 iliac wing in 5 patients, s1 t10 in 9 patients, iliac wing t-10 in 2 patients, and s1-t3 in 4 patients. No TLIP-PLIF was applied to any patient. Laminectomy was performed on the area with isolated stenosis. the patient was followed up for at least 1 year and was examined regarding PJK development and screw loosening

**Results:** PJK developed in 5 of 7 patients who underwent iliac wing stabilization, and the fusion level was increased to t3. Sacral screw loosening was observed in 1 of the patients with s1-t10. The patient was followed up as it was tolerated. Other patients did not develop complications

**Conclusion:** Iliac wing screw insertion to avoid rigid fixation increases the risk of PJK development at higher levels in osteoporotic patients with canal stenosis. If a screw is to be inserted into the iliac wing, the fusion level should be increased up to t3. The ideal fusion level is found to be t10-s1. There was no advantage found in going above T 10 and terminating fusion at t 7-8 levels compared to t 10 level.

**Keywords:** spinal sthenosis with osteoporosis, proksimal junctional kyphosis



**S-078**

## OUR CLINICAL EXPERIENCE IN PATIENTS WHO UNDERWENT BILATERAL DECOMPRESSION SURGERY WITH UNILATERAL APPROACH AND DIAGNOSIS OF DEGENERATIVE LUMBAR SPINAL STENOSIS

Luay ŞERİFOĞLU<sup>1</sup>

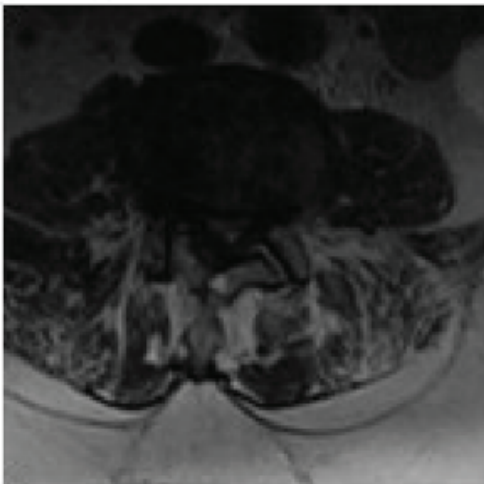
<sup>1</sup>Istanbul Provincial Health Directorate Umraniye Training And Research Hospital- İstanbul- Turkey

**Aim:** Introduction: Patients diagnosed with degenerative lumbar spinal stenosis experience complaints that arise due to reduced walking distance caused by nerve compression. If complaints persist despite medical and physical therapy, spinal surgery, either targeted or non-targeted fusion, may be required. Neural decompression is targeted with surgical treatment. Unilateral approach bilateral decompression (ULBD) surgery expands the spinal canal and eliminates nerve compression without creating instability in the spine. In elderly patients and those with comorbidities, surgery is aimed at reducing complaints with shorter duration and less bleeding. In this study, we examined a total of 25 patients who underwent ULBD surgery between 2017 and 2020.

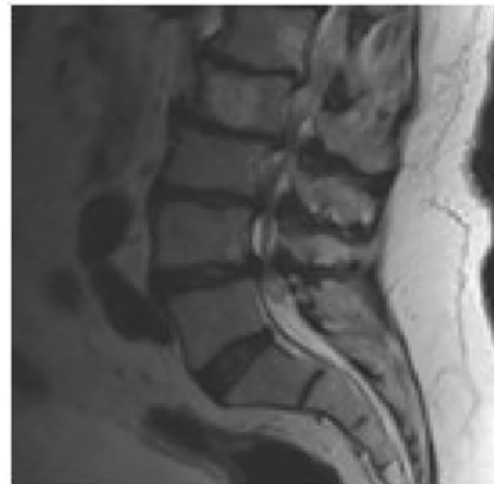
**Method:** We retrospectively examined patients who underwent ULBD surgery with a diagnosis of degenerative lumbar stenosis. Patients were compared in terms of gender, age, VAS scores for regression of complaints, complications, and the need for reoperation during the 5-year follow-up.

### ULBD CASE IMAGES

preop axial



preop sagittal





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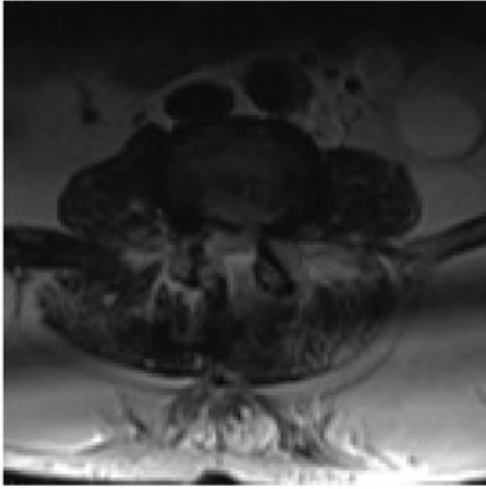
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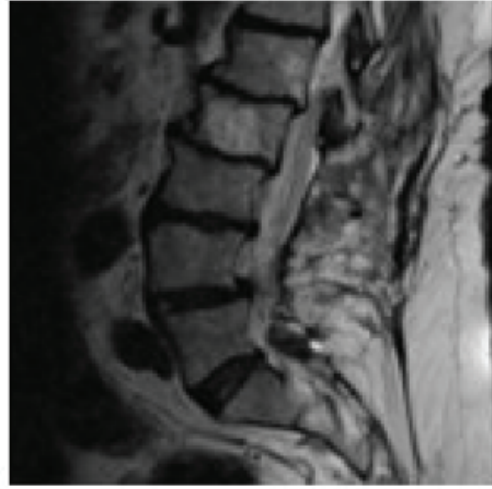


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postop axial



postop sagittal



**Results:** Of the 25 patients we examined between 2010 and 2022, 19 were female and 6 were male. There were 6 female and 3 male patients under the age of 60. There were 13 female and 3 male patients over the age of 60. We performed single-level ULBD surgery in 12 patients, two-level surgery in 11 patients, and three-level surgery in 2 patients. VAS scores improved in 21 of the 25 patients, while significant improvement was not observed in 4 patients. Two patients developed a peroperative dural fistula, and two patients received transforaminal blockage in the postoperative period.

**Conclusion:** In patients diagnosed with degenerative lumbar spinal stenosis, who are not targeted for fusion and who are of advanced age and have comorbidities, minimally invasive ULBD surgery can be preferred

**Keywords:** Unilateral approach bilateral decompression surgery



**S-079**

## MINIMAL INVASIVE SURGERY IN THE SPINE WITH LUMBAR DEGENERATIVE DEFORMITY AND SPINAL STENOSIS: 25 CASES

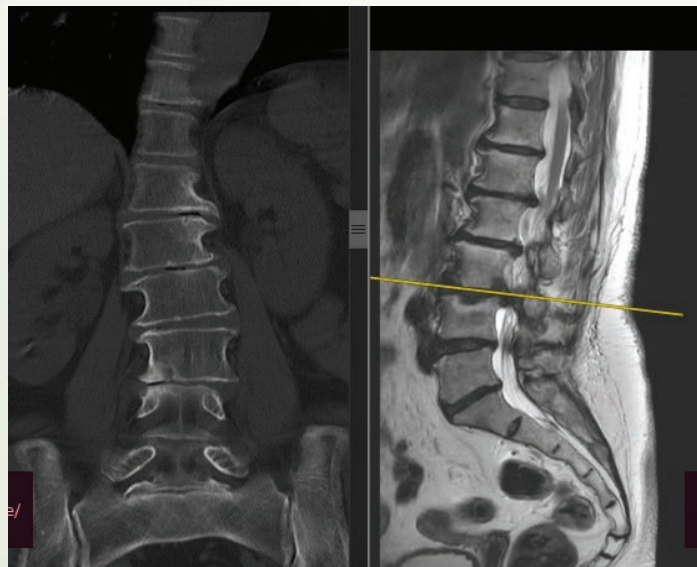
Ali Harmanoğullarından<sup>1</sup>, Mehmet Özer<sup>1</sup>, Ali İhsan Ökten<sup>1</sup>, Can Sezer<sup>1</sup>, Şüheda Özkavaklı<sup>1</sup>

<sup>1</sup>Adana City Education And Research Hospital

**Aim:** Spinal stenosis, which develops due to lumbar degenerative deformity, is a lumbar deformity that occurs in advanced ages due to degeneration of spinal elements and has become an important public health problem with increasing average age rates. They are extremely rare under the age of 40. Its incidence is 6% over the age of 50, and it is generally seen as a disease over the age of 60. Since comorbid diseases are high in a large proportion of these patients, the risks of surgery are also high. In this study, the results of minimally invasive surgery performed without instrumentation in 25 patients with high lumbar comorbidity, lumbar degenerative deformity and spinal stenosis were evaluated.

**Method:** 25 patients with lumbar degenerative deformity spine that I personally operated between January 2019 and December 2022 were included in the study. Patients with vertebral fracture and spondylolisthesis were excluded from the study. All patients had low back and leg pain complaints and neurogenic claudication complaints. All patients underwent preoperative and postoperative lumbar 4-way lumbosacral radiography, CT and MRI examinations. Preoperative and postoperative low back and leg pains of the patients were evaluated according to VAS scoring. Bilateral decompression was performed with a unilateral approach without one, two or three level laminectomy and wide facetectomy according to the complaints and side findings of the patients.

before and after the operation





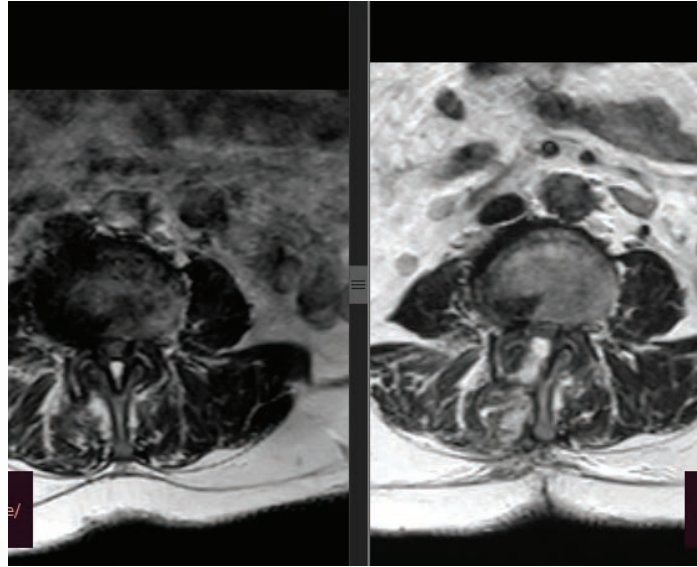
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**Results:** The mean age of the patients was 67.1 (60-81). 19 were female and 6 were male. Bilateral decompression was applied to 17 patients with a single level approach and 8 patients with a 2 level unilateral approach. The mean preoperative waist and leg VAS scores were 6.50 and 7.00, respectively. Postoperative waist and leg VAS scores were 3.57 and 3.19. Dural repair was performed during surgery in 1 patient due to the development of dural injury. The mean follow-up period of the patients was calculated as 18.4 (6-28 months) months. Instability developed in 3 of the patients during follow-up. However, the patient and his relatives did not accept the operation due to comorbidity.

**Conclusion:** Especially in the elderly and comorbid patients with lumbar degenerative deformity and spinal stenosis, bilateral decompression with a unilateral approach is a minimally invasive method that reduces the surgical time by avoiding the complications that may occur due to the instrument. It can be applied as a surgical method in selected patients.

**Keywords:** SPINAL STENOSIS, MINIMAL INVASIVE SURGERY



**S-080**

## MINIMALLY INVASIVE APPROACH TO OSTEOPOROTIC VERTEBRAL FRACTURES, BALLOON KYPHOPLASTY RESULTS ON LOW BACK PAIN, CLINICAL TRIAL

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<sup>1</sup>University of Health Sciences, Kayseri City Hospital, Neurosurgery Department, Kayseri, Turkey.

**Aim:** Vertebral fractures are common in osteoporotic patients and may occur after minor trauma or without trauma. In patients presenting with low back pain, it appears as a 10-15% or more decrease in the height of the vertebral corpus radiologically. The aim of the treatment of osteoporotic vertebral fractures is to restore the biomechanical and physiological stability of the vertebra. Especially advanced aged patients, with a fracture for less than three months and those who complain of severe pain are suitable candidates for Balloon Kyphoplasty (BK). Vertebroplasty and kyphoplasty, which are minimally invasive procedures, are performed under sedation as a local anesthetic and allow early postoperative mobilization of patients.

**Method:** BK was applied to 64 patients diagnosed with osteoporotic vertebral fractures in our clinic. After the evaluation of vertebral graphy, they were mobilized at the 6th hour postoperatively. The pain Visual Analogue Scale (VAS) test was applied to the patients before and after surgery to compare the severity of their pain. The pain VAS is a unidimensional measure of pain intensity, used to record patients' pain progression, or compare pain severity between patients with similar conditions. For statistical analysis, the national statistical software TURCOSA was used and analyzed. Frequency and percentage, mean value, standard deviation, min-max were used for descriptive statistics.

Figure 1



Figure 1: L1 level vertebral fracture with Balloon Kyphoplasty, sagittal section of CT scan.



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**Results:** Of the 64 patients in the study, 39 (61%) were female and 25 were male (39%). The mean age of the patients was  $68.57 \pm 10.68$  years and the median age was 69 years. The most common fracture level of the patients was T12 with 25% (n:16) L1 with 23.43% (n:15) and L2 with 12.5% (n:8). The preoperative VAS mean score of the patients was  $8.03 \pm 0.79$  (min-max: 7-9) median: 8 and the post-operative VAS mean score was  $1.73 \pm 0.73$  (min-max: 1-2) median 2. A statistically significant difference was found between the preoperative and postoperative VAS scores of the patients ( $p < 0.001$ ).

**Conclusion:** Vertebral fractures are common and play a leading role in the destruction of osteoporosis. The risk of fracture increases with age. The morbidity of patients with osteoporotic vertebral fractures increases and mortality rates increase according to age. Vertebral fractures are seen mostly at the thoracolumbar junction (T11-L2) and we encountered fractures most frequently at T12 and L1 levels. In the literature, within one year following an osteoporotic vertebral fracture, the rate of development of additional vertebral fractures at levels may be between 5% and 29% shown. In our study, there were patients with 2 or more level vertebral fractures. The decrease in the pain of the patients was a direct indication that the minimally invasive procedure was beneficial.

**Keywords:** Balloon Kyphoplasty, osteoporotic vertebral fractures, minimally invasive, percutaneous kyphoplasty



S-081

## INVESTIGATION OF THE EFFECTS OF EXERCISE ON PULMONARY FUNCTION, SPINAL STRUCTURE AND MOBILITY IN INDIVIDUALS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

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**Aim:** Adolescent idiopathic scoliosis affects the spine and soft tissue structures, causing physical problems such as postural disorders and decreased flexibility of the spinal column. Our study aims to examine the effect of exercise on spinal structure and mobility in individuals with adolescent idiopathic scoliosis.

**Method:** Twenty individuals (gender; 6 males-14 females, age; 14(13-16) years, height; 164.75 (160.12-174.25) cm, weight; 50.8(41.25-62.95) kg, BMI;18.04(16.47/22.12) kg/m<sup>2</sup>) with Lenke type 1 curvature and diagnosed with moderate scoliosis with 20-40 degree Cobb angles, who applied to our clinic between 2021 and 2023 and were diagnosed with scoliosis were included in this study. 24 sessions of Schroth exercises and stabilization exercises were applied to the individuals. Pre-treatment and post-treatment evaluations were made. Pulmonary function was evaluated by measuring the basal and xiphoid chest circumferences during inspiration and expiration using a tape measure. Spinal structure and mobility were evaluated by the İDIAG M360 Spinal Mouse device. Angle trunk rotation (ATR) were measured with a scoliometer during standing and sitting position. Trunk flexor and lateral flexor flexibility were evaluated with fingertip ground distance using a tape measure.

**Results:** A statistically significant increase was found in the basal and xiphoid chest diameters after the exercise program ( $p<0.001$ ). There was a statistically significant increase in trunk flexion ( $p=0.009$ ) and trunk lateral flexion ( $p=0.002$ ) flexibility. While there was a significant decrease in the thoracic rotation angle in standing and sitting ( $p<0.001$ ), a significant decrease was found only in the sitting lumbar rotation angle ( $p=0.048$ ). A statistically significant decrease was found ATR in standing ( $p<0.001$ ) and sitting ( $p<0.001$ ). While there was a decrease in the thoracic kyphosis angle ( $p=0.008$ ), and the sacral ( $p=0.004$ ) and lumbar lordosis angle increased ( $p=0.045$ ) in the upright position, there was no statistically significant difference in the spinal inclination angle ( $p=0.790$ ). While there was a decrease in the thoracic kyphosis angle ( $p=0.016$ ) and an increase in the sacral angle ( $p=0.031$ ) in the trunk flexion position, there was no statistically significant change in the lumbar lordosis angle ( $p=0.896$ ) and spinal inclination angle ( $p=0.150$ ).

**Conclusion:** It was observed that scoliosis-specific exercise approaches applied specifically to spinal curvature increased pulmonary function, trunk flexibility, and mobility, and reduced rotational deformity. It is recommended to include scoliosis-specific exercise programs in the treatment process to control the rotational deformity and prevent pulmonary complications that may occur in the future.

**Keywords:** Adolescent idiopathic scoliosis, sagittal plane, mobility, spinal structure, Schroth exercises



**S-082**

## VERTEBRAL OSTEIOD OSTEOMA, FACET JOINT PROTECTIVE TECHNICAL METHOD WITH CASE PRESENTATION

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**Aim:** Osteoid osteoma is the cause of painful scoliosis of the spine. The most valuable test in diagnosis is imaging of the nidus focus on tomography imaging 1. Nidus is often located in the posterior elements of the spine and in cases with facet joint and intracanal involvement, interventional radiological procedures are avoided because of the risk of thermal necrosis 1,2. Curettage offers curative treatment in surgical treatment. With the help of technological navigation systems, the mass can be excised by opening a cortical window over the nidus without the need for facet joint resection 3. Our aim in our study is to provide direct anatomic localization of the mass by tomography examination and to describe a technical method for facetectomy and wide laminectomy, which can be used for centers without navigation systems.

**Method:** A 13-year-old male patient diagnosed with L1 vertebral osteoid osteoma due to painful scoliosis, tomography examinations were performed using multiplanar formatting (MPR) with MIP (maximum intensity projection) and 3D volume rendering via a DICOM viewer program, and screenshots were taken. Over the PowerPoint application, the X-Ray and 3D spine images of the patient were added to the sequential slides in such a way that the MIP sections were transparent, and the mass was clearly visible, and the images containing the nidus were overlapped (Figure 1). The anatomical localization was clarified and the bony cortex location to be seen in the surgical exposure was determined (Figure 2).

figure 2

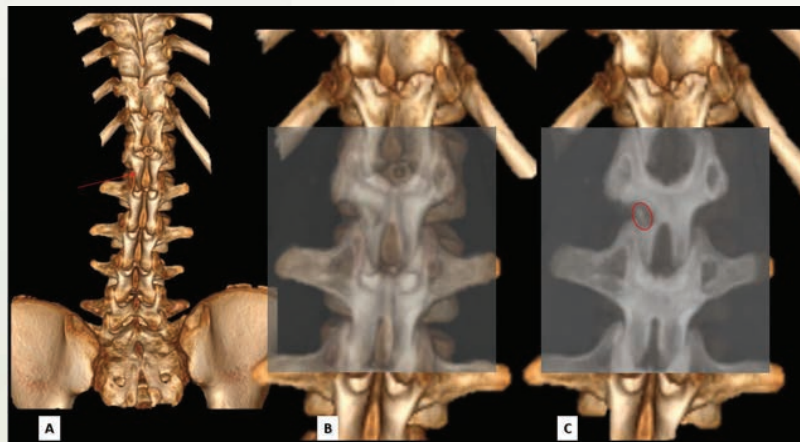


Figure 2. CT images with 3D Volume Rendering (A) and MIP images (B and C) with changed transparency values are overlapped to see the location of the tumor on the cortical bone during surgical exposure. The red arrow and circle indicate the level of the tumor.



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**Results:** The nidus was curetted from the cortical bone, which was determined during surgery, through the window opened with a burr motor, and the facet joint was preserved, and total excision of the tumour was performed. In the 24-month follow-up, the patient's scoliotic deformity resolved (Figure 3).

**Conclusion:** Conclusion: Some conveniences brought by expensive navigation systems can be provided free of charge by analyzing the imaging examinations we have on modern computer programs.

**Keywords:** osteoid osteoma, minimally invasive surgery, spine tumour



S-083

## SURGICAL TREATMENT RESULTS OF ADULT TETHERED SPINAL CORD SYNDROME

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Rahmi Kemal KOÇ<sup>2</sup>

<sup>1</sup>Özel Erciyes hastanesi

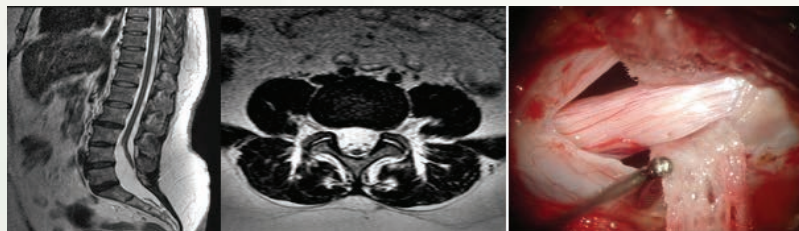
<sup>2</sup>Erciyes Üniversitesi tıp fakültesi beyin cerrahi

**Aim:** Tethered cord syndrome (TCS) is a diseases characterized by progressive neurologic deficits that occur with stretching of the spinal cord due to congenital or acquired causes In this study, we tried to reveal the factors that cause the emergence of symptoms, how and when surgical planning should be done, the effects of accompanying spinal pathologies on surgical results and the results of surgical treatment with all its components in patients diagnosed with TCS in adulthood.

**Method:** We reviewed 20 patients diagnosed with adult TCS who were followed and treated in our clinic between 2010 and 2021. The patients under the age of 18 and associated disorders such as diastematomyeli, lipom were excluded from the study. The mean follow-up period was 30 months.

**Results:** The mean age was 29.9 years and the mean follow-up period was 30 months. Of the 20 patients with low back and leg pain, 16 had relief. 2 were partially benefited and 2 were unchanged. In nine patients, carrying heavy loads, excessive exercise, childbirth, walking too long before the onset of symptoms were detected. The complaint of 1 of the patients with urinary incontinence improved. Three of them continued with frequent urination. There was no change in two of them. There was no improvement in sensory dysfunction and sphincter dysfunction.

Sagittal axial MRI images of TCS and surgical image



**Conclusion:** TCS are traditionally believed to be pediatric disorders defined by the onset of neurological deficits in early childhood. Despite the origin of this condition in embryogenesis, there is a poorly characterized subset of TCS patients who subsequently become symptomatic in adulthood. Spinal pathologies accompanying tethered cord should be considered when planning surgical treatment in adult patients with TCS. Predisposing factors leading to the onset of symptoms should be well questioned. It should be kept in mind that early diagnosis and early surgery have a favorable effect on treatment outcomes. Considering that postoperative recovery of the neurologic picture takes years, long-term follow-up of patients is absolutely necessary to demonstrate the efficacy of surgery.

**Keywords:** Adult tethered cord syndrome, tethered cord, incontinence.



S-084

## INTRACRANIAL COMPLICATIONS AFTER LUMBAR SPINAL SURGERY: OUR CLINICAL EXPERIENCE

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<sup>1</sup>SBÜ Bozyaka Eğitim Araştırma Hastanesi

**Aim:** In this study, intracranial symptoms after surgery for disc herniation are presented. We also discuss presumed pathophysiology, differential diagnosis, and avoidance of remote intracranial complications after lumbar spinal surgery.

**Method:** Between 2012-2022, 7 cases with intracranial complications after lumbar spinal surgery were evaluated in Izmir Bozyaka EAH Brain and Nerve Surgery Clinic. Data regarding the following variables were looked for: demographics, clinical presentation, postoperative complications, location of intracranial events, radiologic findings, treatment strategies, and outcome.

**Results:** There were 7 cases (5 women and 2 men) with remote intracranial events happened after lumbar spine surgery. Symptoms included headache (n=6), seizure (n=1), visual problem (n=2). All patients underwent head CT, Pneumocephaly was observed in 2 patients, while the others were normal. Glaucoma was detected in two patients who developed vision loss. The patients were followed for about a week, and their complaints regressed after the treatment.

**Conclusion:** Intracranial complications should be kept in mind in patients with persistent headache and sudden vision loss after lumbar spinal surgery. It is especially complicated by the known dural tear and CSF leakage.

**Keywords:** Intracranial, complication, lumbar spine surgery



S-085

## CHALLENGES OF REVISION SURGERY IN SPINAL INSTRUMENTATION AND METHODS USED

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**Aim:** The aim of this study is to discuss and explain the perioperative peroperative strategies in revision surgery. In revision surgery, surgical instrument incompatibility arising from the difference in medical materials may cause peroperative surgical difficulties. It has a surgical approach to provide strength, stability and bone fusion in spinal revision surgery. surgeons

**Method:** As Pamukkale University Hospital, revision surgery was performed on 237 patients between February 2019 and December 2022, and 63 of these patients were previously operated by us. Intraoperative difficulties and incompatibility of medical materials were not experienced in patients operated on in our center, since there was no difference in the medical equipment used in revision surgery. Since the remaining 174 patients were operated in an external center and the medical equipment and surgical instrument removal kits used were different from those in the hospital, they were insufficient and various difficulties were experienced. A detailed anamnesis was taken from the patients before the operation, the date of the operation and the center of the operation were questioned, and the medical companies working with the hospital at that time were searched and surgical instrument removal kits suitable for it were searched. The medical company was asked to supply these sets. Thanks to the compatible removal set in 79 patients, the removal of the screw caps and the screw during the operation was successful.

**Results:** Some methods have been developed by us during the operation and these experiences have been gained in a 2-year period. Due to the differences in medical materials used in revision surgery, some methods have been developed by us.

**Conclusion:** In recent years, as the surgical treatment of spine and spinal cord diseases increases, the use of instrumentation in these treatments also increases, so the number of patients whose complaints do not go away, worsen and need revision surgery is increasing proportionally. With the increase in the number of patients, the number of operations and the difficulties during the operation increase.

**Keywords:** revision surgery, spinal instrumentation, surgical difficulties



S-086

## COMPARISON OF TWO POSTERIOR INSTRUMENTATION TECHNIQUES IN MULTILEVEL CERVICAL SPONDYLOTIC MYELOPATHY TREATMENT: LATERAL MASS SCREW FIXATION VS PEDICLE SCREW FIXATION

Zeki Boğa<sup>1</sup>

<sup>1</sup>Adana Şehir Hastanesi

**Aim:** In this study we compared the clinical results of two posterior instrumentation methods in surgical treatment of multilevel cervical spondylotic myelopathy (CSM) and we aimed to share the clinical outcomes.

**Method:** This study was a retrospective analysis of patients with multilevel CSM disease who underwent decompression and posterior internal fixation with lateral mass screw (LMS) or pedicle screw (PS). The study included 63 patients and the patients were divided into two groups. The LMS group comprised 32 patients and the PS group included 31 patients. C2-7 cervical lordosis, modified Japanese Orthopedic Association (mJOA) scores, neck disability index (NDI) and visual analog scale (VAS) assessments of the groups were compared. Complications were noted and analyzed in detail.

**Results:** In the PS group, change in C2-7 lordosis was found to be significantly higher than the LMS group ( $p<0.001$ ). Changes in quality of life indices (mJOA, NDI and VAS) in the postoperative period did not show a significant difference between LMS and PS groups ( $p=0.608$ ,  $p=0.224$  and  $p=0.296$ ). In the study group, 10 complications were observed in 63 patients (10/63, 15.8%). Implant related complication ratio was found to be significantly higher in the LMS group.

**Conclusion:** Both of the posterior instrumentation methods revealed similar results in terms of quality of life indices. In this study, better results were obtained in the PS group in terms of C2-7 lordosis and implant-related complications. We think that both methods can be used in CSM treatment, however PS fixation is technically challenging with a long learning curve. Therefore, we have the opinion that it can be applied in selected patients by trained and experienced surgeons.

**Keywords:** cervical spondylotic myelopathy, lateral mass screw, pedicle screw



S-087

## RETROSPECTIVE ANALYSIS OF PATIENTS OPERATED DUE TO NEURAL TUBE DEFECT IN OUR CLINIC

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**Aim:** Neural tube defects(NTD) are common congenital anomalies that develop when a part of the neural tube doesn't close normally during the fifth and sixth weeks of pregnancy. NTD can be open or closed. Open NTD is 80 percent; the most common is myelomeningocele. 90% of newborns with NTD have enlarged ventricles, indicating some degree of hydrocephalus.1 VP shunt is required in approximately 60 percent of patients.2 Meningocele is less common. Meningoceles are cystic cavities under the skin that contain cerebrospinal fluid(CSF) surrounded by the meninges. Myelomeningocele contains neural tissue in the cavity as a difference. Patients may have weakness in the lower extremities and bowel/bladder dysfunction. It is the most common isolated vertebral defect in closed NTD. Diastomatomyelia is also a subtype of closed NTD. It is used to describe anomalies in which the spinal cord is divided.3 Tethered cord syndrome can occur in all neural tube defects. In this study, we wanted to evaluate the data of 8 patients who were surgically treated for NTD in our clinic.

**Method:** The data of 8 patients who were operated for NTD in Ankara Etlik City Hospital were evaluated retrospectively. Demographic characteristics, surgical treatments and complications of the patients were examined.

**Results:** 3 of the patients(37.5%) were male and 5 of the patients were female. One of the male patients was 13 years old and the other patients were newborns. 1 of 8 patients(12.5%) was closed NTD and 7 of them was open NTD. 5 of the patients with open NTD(71.4%) had myelomeningocele and 2 of the patients with open NTD had meningocele. Hydrocephalus didn't develop in patients with meningocele and didn't need any VP shunt. Hydrocephalus developed in 4 of 5 patients with myelomeningocele(80%) and a VP shunt was inserted. No new weakness developed in any of the patients. In 1 patient, it was observed that the lower extremity strength improved compared to the preoperative period. Wound infection didn't occur in any of the patients(0%) and there were no complications. Emergency surgical treatment was performed in 1 patient due to CSF discharge from the cavity wound.

**Conclusion:** Especially in patients with open NTD, surgical treatment for the first 72 hours greatly reduces the risk of loss of strength, bowel/bladder dysfunction, and central nervous system infection.4 It should be kept in mind that patients with NTD may require a VP shunt due to the need for early treatment and hydrocephalus.

**Keywords:** neural tube defects, hidrocephalus, myelomeningocele, meningocele, ventriculoperitoneal shunt



S-088

## SCREWING THE LOWER CERVICAL PEDICLE WITH THE USE OF PEROP OF THE 3D MODEL

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**Aim:** Narrowing of the vertebral canal due to trauma, rheumatologic diseases, neoplastic processes in the cervical vertebrae may result in complaints such as loss of strength, loss of sensation and difficulty in performing daily vital activities involving both upper and lower extremities. In this case, transpedicular instrumentation with a posterior approach is performed in surgical treatment in appropriate patients. The pedicle route allows the instrument to travel longer in the bony mass and terminate in an area such as the corpus where thick bone tissue remains around, thus creating a relatively more biomechanically durable system. However, the difficulties of this method include the possibility of malposition of the screw due to thin cervical vertebral pedicles, congenital or age-related anatomical changes, and the possibility of nerve damage by advancing into the vertebral canal. For this reason, with the developing technology, it was thought to create models to be used during surgery using a 3D printer without the need for neuronavigation.

**Method:** In our study, with the help of 3D modeling, which is a new technique nowadays, and 3D printing, it was thought to create a guide that could be placed on the vertebrae of the patients during surgery in accordance with the vertebral alignment of the patients, specific to each patient, almost like a key-lock model. With the data obtained from the preoperative imaging of the patients, the instrument directions were calculated and these areas were left blank on the guides. Then, the prepared guide model is prepared specific to the patient by manually drilling with the help of a motor in accordance with the pedicle tracing in the preoperative period and reaching the place where the screw is desired to end in the corpus. With this method, it is aimed to reduce perioperative complications and shorten operation times by sterilizing the models.

**Results:** In our study, computer-aided models were created with 3D computed tomography in 8 patients who underwent cervical pedicle screws for posterior segmental instrumentation in our clinic, and the final physical model was obtained by printing these models with a 3D printer. This model played a helpful role in intraoperative navigation and determination of instrument orientation.

**Conclusion:** The use of these models for navigation purposes is not available in large case series and clinical studies in the current literature.

**Keywords:** transpedicular instrumentation, cervical vertebra, 3d model



S-089

## ONE-STAGE SURGICAL TREATMENT OF SEVERE SCOLIOSIS WITH DIASTOMETAMYELIA; CASE SERIES

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**Aim:** Split spinal cord malformation is rare in scoliosis. This study evaluated the safety and effectiveness of one-stage surgical treatment of congenital scoliosis in patients with split spinal cord malformation in a single Turkish center.

**Method:** A retrospective study of 3 cases who underwent surgery for congenital scoliosis with split spinal cord malformation (all of them are type I) from March 2015 to March 2017. Patients included 3 females with a mean age of 5,3 years. All patients underwent one-stage posterior surgery with resection of a bony spur firstly in split spinal cord malformation type I. Concave side ;we used growing rod systems initially for convex side single rod curved and used. Rod lengthening done in every 6 months. After shoulder balance gained we change the single rod to growing system. Clinical symptoms and radiological changes were evaluated preoperatively and for at least 2 years postoperatively.

**Results:** Preoperatively, 3 patients had not any neurological and other symptoms. They had a mean preoperative Cobb angle of  $68 \pm 12,3^\circ$  and T2-T12 kyphosis of  $20 \pm 21^\circ$ . In all 3 patients we removed bony spur. The mean postoperative Cobb angle was  $35.6 \pm 5,4^\circ$  with a correction rate of  $48 \pm 8,0\%$ . There were no neurological deficit complications or deteriorated neurological signs postoperatively or at follow-up

**Conclusion:** One-stage surgical treatment of congenital scoliosis with split spinal cord malformation could be safe and effective, but we need further multicenter studies with larger samples. Intraspinal intervention of bone spur was recommended in Split spinal cord malformation type I before deformity correction.

**Keywords:** diastometamyelia, severe scoliosis



S-090

## SURGICAL AND CLINICAL RESULTS IN PATIENTS WITH SPINAL OSSEOUS MALIGNANT TUMORS

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**Aim:** 55% of tumors in the spine affect the bone tissue. Malignant tumors involving the vertebral corpus can be categorized as primary and secondary (metastatic) tumors. The primary group is very uncommon, and its precise incidence is unknown. Secondary malignant vertebral tumors (metastases) account for 95% of cases. Bone tissue is the third most common site of metastasis. With Tomita and Tokuhashi scoring, treatment can be planned according to the survival times of the patients. The neurological status of the patients is evaluated oncologically in a multidisciplinary manner, including cancer type and response to radiotherapy, mechanical instability, and whether there is a systemic disease (NOMS). According to the diagnosis and survey of primary or secondary osseous spinal cancer in patients, it is crucial to address their quality of life and ensure continuity of care by surgically managing pain and addressing any instability that may be present.

**Method:** Between 2016 and 2022, patients admitted with lower back and back pain and neurologic deficits were retrospectively analyzed. 50 patients with primary or secondary malignant vertebral tumors were retrospectively analyzed for age, gender, surgery performed, Frankel scoring, epidural spinal cord scoring, Spinal instability scoring in oncology cases, Tokuhashi score, the number of vertebrae affected, the level of frequency, sensitivity to radiotherapy, diagnosis, and duration of the survey.

**Results:** There are 32 male and 18 female patients. The mean age of the patients is  $59.60 \pm 13.92$ . Most commonly, the thoracic vertebrae were affected. 12 patients underwent only a biopsy procedure, 23 patients underwent a biopsy and vertebroplasty procedure, and 15 patients underwent a post-stabilization procedure. The majority of patients in the primary Tm group are sensitive to radiotherapy. Tumor type, TS, and survival were statistically significant when the sensitivity and resistance to radiotherapy were compared with the factors using the independent T-test. Life expectancy in radiotherapy-sensitive patients was  $13.68 \pm 8.84$  months, and life expectancy in resistant patients was  $7.16 \pm 4.91$  months.

Primary or Secondary malignant vertebral tumors (PMT) (SMT) and results

	PMT	SMT	p value
Age	62,30±14,7	56,6±12,66	0,154
Vertebra number	1,88±0,81	2,04±0,95	0,534
ESSC	1,30±0,47	1,083±0,28	0,049
Tokuyashi Score	9,26±1,51	8,29±2,49	0,097
SINS	11,50±1,63	11,70±2,01	0,688
Survival	15,61±10,0	8,33±4,08	0,002
Frankel Score	3,80±0,89	4,54±0,77	0,003



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Primary or Secondary malignant vertebral tumors (PMT) (SMT) and results(epidural spinal cord scoring , Spinal instability scoring in oncology cases

**Conclusion:** The primary focus is uncertain, the survey is longer than metastases due to its sensitivity to radiotherapy in spinal malignant osseous tumors, and open surgery is more common due to the development of early neurological deficits. The ESC criteria and Frankel neurological scoring are also important factors in the open surgery decision. Although the surgical procedure does not affect the patient's survey, minimally invasive intervention should be planned if the patient's general condition is poor and the survey is less than 3 months.

**Keywords:** spine, osseous malignant tumors, metastasis



S-091

## EFFICACY OF FORAMINAL INJECTION AND FACET ABLATION TREATMENT FOR LUMBAR DEGENERATIVE DISEASE

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**Aim:** Lumbar degenerative disease is one of the most common causes of low back pain in the middle-aged and elderly patient population worldwide. Treatment is divided into conservative and surgical methods. Recently, foraminal injections and facet ablations have become popular in conservative treatment. In this study, we evaluated the effectiveness of foraminal injection and facet ablation in terms of pain and patient functionality.

**Method:** Between January 2022 and December 2022, we applied foraminal injection and facet ablation to 48 patients with lumbar degenerative disease. Exclusion criteria include patient withdrawal study and have a spine operation follow-up time. Visual Analog Scale (VAS) and Oswestry Disability Index (ODI) was used in this study.

**Results:** 38 participants who received the foraminal injection + facet ablation treatment were included in the study. 22 participants (57.9%) was female, and 16 of them (42.1%) was male. Before treatment, Visual Analog Scale (VAS) score was 7.9 (1.2) points and Oswestry Disability Index (ODI) score was 64.3 (9.1). When participants evaluated before treatment, after 4 weeks and after 8 weeks with VAS and ODI; it was found that there was a statistically significant decrease between three times in terms of VAS ( $p < 0.001$ ). Additionally, there was a statistically significant increase between pre-treatment – after 4 weeks and pre-treatment – after 8 weeks ( $p < 0.001$ ), but no difference was found between after 4 weeks and after 8 weeks in terms of ODI ( $p = 0.175$ ).

**Conclusion:** Foraminal injection and facet ablation is a treatment that provides short-term benefits in terms of pain and functionality in conservative treatment of lumbar degenerative disease.

**Keywords:** VAS, ODI, facet ablation, foraminal injection



**S-092**

## VERTEBRAL ANEURYSMAL BONE CYST IN THE PEDIATRIC AGE AND MANAGEMENT OF ITS TREATMENT

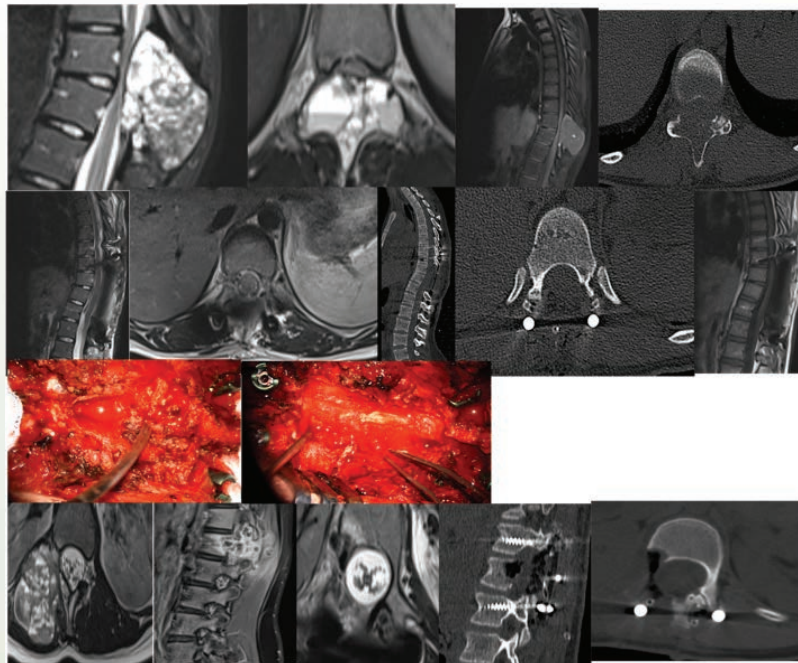
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**Aim:** Aneurysm bone cysts are non-malignant, tumor-like vascular lesions consisting of blood-filled channels. They are most commonly seen in the femur, tibia, and vertebrae. 80% of these are seen under the age of 20. They may present with insidious onset of pain, pathological fractures, edema, and palpable mass within weeks or months. The neurological deficit can be seen in acute and chronic stages. Surgical excision is usually curative. However, the probability of spontaneous recurrence is 19%. Patients should be followed up regularly for up to 5 years for reproduction.

Figure 1



Pre and postoperative MR and CT images of 2 pediatric vertebral aneurysmal bone cysts

**Method:** X-Ray: Eggshell, limited cystic structure, destroyed bone CT: Cystic structure limited to eggshell, swallowed bone dead cell fluid, and fluid-fluid level between serum may be seen. MR T1 and T2 images are consistent with blood or liquid, depending on the condition of the lesion. Contrast involvement + There may be



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a pathological fracture next to the cystic structure. Differential diagnosis; Chondroblastoma, Fibrous dysplasia, Giant cell tumor, Telangiectatic osteosarcoma, Unicameral bone cyst. The presence of root/cord compression will require surgical decompression. In the fact of instability, stabilization may be necessary. To obtain a total cure, total excision should be performed.

**Results:** Case 1-A 16-year-old patient complained of decreased sensation in the lower extremities and weakness, and a giant cystic mass pressing on the spinal cord was found at the thoracolumbar junction. He had bilateral 2/5 paraparesis and hypoesthesia in his lower extremity. The patient underwent gross total mass resection and posterior spinal instrumentation surgery. The patient, whose paresis improved in the early postoperative period, was mobilized. Case 2-A 13-year-old K patient was diagnosed with erysipelas with complaints of right paravertebral swelling, tenderness, and pain, and medical treatment was started. After his complaints did not go away, he was operated on when a vertebral aneurysmal bone cyst was detected in his examinations. Since the patient had severe bleeding from the lesion during the operation, only the soft tissue mass was removed. When his hemodynamics was stable, right pediculectomy and posterior segmental instrumentation were performed in his second operation. The pain of the patient, who was mobilized on the 2nd postoperative day, was relieved.

**Conclusion:** An aneurysmal bone cyst is very common in childhood. It must be excised entirely, with or without a neurological deficit. A complete cure can be achieved with total resection; strict follow-up regarding recurrence is required. If there is instability after removing the lesion, stabilization should be performed with instrumentation.

**Keywords:** Pediatric Age, Aneurysmal Bone Cyst, Total Excision, Instability, Instrumentation



S-093

## THE MAJOR DIFFERENCES OF CORONAL AND SAGITTAL SECTIONS ON PEDIATRIC TERM SCOLIOSIS DURING HALO GRAVITY TRACTION TREATMENT

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**Aim:** Scoliosis is a complex disease with 3-dimensional rotation defect of vertebral column. In cases of rigid scoliosis in childhood, Halo Gravity Traction (HGT) treatment, a minimally invasive procedure, has been used in addition to surgical treatment to maximize the benefits of surgery. HGT treatment has been used in the treatment of rigid scoliosis cases with a Cobb angle of over 100 degrees. The aim of this study was to investigate the effects of Halo Gravity Traction (HGT) treatment on the changes in coronal and sagittal sections in pre and postoperative imaging of patients undergoing HGT treatment.

**Method:** In our clinic, the coronal and sagittal angle changes on direct radiographs of 14 patients (6 males and 8 females) between the ages of 8-18 years old, with a Cobb angle of 100 degrees or more, who underwent Halo traction were measured before traction, during traction, and in the postoperative period from 2021 to 2023. The duration of the Halo traction treatment varied between 4-8 weeks for the patients. All patients underwent surgery after the traction treatment and were followed up postoperatively in our clinic.

**Results:** It has been observed that there is an average improvement of 20-40 degrees in preoperative coronal and sagittal angles with HGT. The target Cobb angle with Halo traction is to decrease it below 50% of the initial angle, and our clinical follow-ups have shown that patients primarily experience improvement in sagittal plane angles. None of the patients had any additional complications before or after HGT treatment.

**Conclusion:** With HGT, patients experience positive changes in postural alignment after surgery, and complications that may arise from surgery are reduced due to the softening effect of traction on the angle that needs to be corrected. Especially in the pediatric age group, Halo traction has provided extremely positive results, increasing the success of surgical treatment. The higher postoperative patient comfort and reduced risk ratio indicate that HGT treatment is highly effective in achieving the target correction.

**Keywords:** Halo Gravity Traction, Scoliosis, HGT, halo traction



S-094

## COMPARISON OF SPINE STRUCTURE AND MOBILITY AND POSTURAL STABILITY IN WOMEN WITH AND WITHOUT HYPERKYPHOSIS: A CASE-CONTROL STUDY

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**Aim:** It is important to maintain correct and upright posture in maintaining postural stability. In individuals with hyperkyphosis, besides the deterioration of the upright posture, it can cause changes in the structure and mobility of the spine and postural stability. In this direction, it was aimed to compare the spine structure and mobility and postural stability of women with hyperkyphosis in our study.

**Method:** Sixty subjects, including 30 women with normal kyphosis [age;  $54.70 \pm 7.75$  years, body mass index (BMI);  $26.69 \pm 5.05$  kg/m<sup>2</sup>] and 30 women with hyperkyphosis [age;  $55.50 \pm 6.88$  years, BMI;  $29.07 \pm 6.32$  kg/m<sup>2</sup>], were included in the study. The dominant lower extremity of all participants was right. Spinal structure and mobility were evaluated with the HocomaValedo®Shape (Idiag, Fehraltorf, Switzerland) device. Measurements were made on the spinous processes between C7 and S2 in the sagittal plane upright, maximum trunk flexion and extension position, in the frontal plane upright, and right and left lateral flexion. Balance was evaluated with a postural stability assessment device (ProKin 252, TecnoBody, Italy). Evaluation was made in an upright position on one leg (eyes-open) and both legs (eyes-open and eyes-closed). Static balance and stability limit were calculated and recorded.

**Results:** In our study, it was observed that there was no significant difference between the other spine angles and mobility in the sagittal and frontal planes of the groups with higher thoracic angle values in the sagittal plane compared to the women with normal kyphosis ( $p < 0.001$ ). It was found that the mean displacement of the X-axis pressure center on the double foot and dominant lower extremity of women with hyperkyphosis was increased compared to women with normal kyphosis ( $p = 0.031$ ,  $p = 0.023$ , respectively). There was no significant difference in other static balance and stability limit results between women with hyperkyphosis and women with normal kyphosis ( $p > 0.05$ ).

**Conclusion:** It was found that the spine structure and mobility of women with hyperkyphosis and normal kyphosis were similar except for the thoracic angle value in the sagittal plane. It was found that the balance of both feet and one foot on the dominant lower extremity deteriorated when the eyes were open in women with hyperkyphosis. This situation shows that with the increase in the thoracic angle in women with hyperkyphosis, postural stability and related factors may be negatively affected. Keeping the thoracic angle within normal limits may be important in preventing the deterioration of postural stability and secondary problems that may occur with it.

**Keywords:** Spinal deformity, Women, Postural stability, Hyperkyphosis



**S-095**

## COMPARISON OF TRANSFORAMINAL INJECTION AND COMBINED RADIO FREQUENCY ABLATION IN PATIENTS WITH LUMBAR DISC HERNI

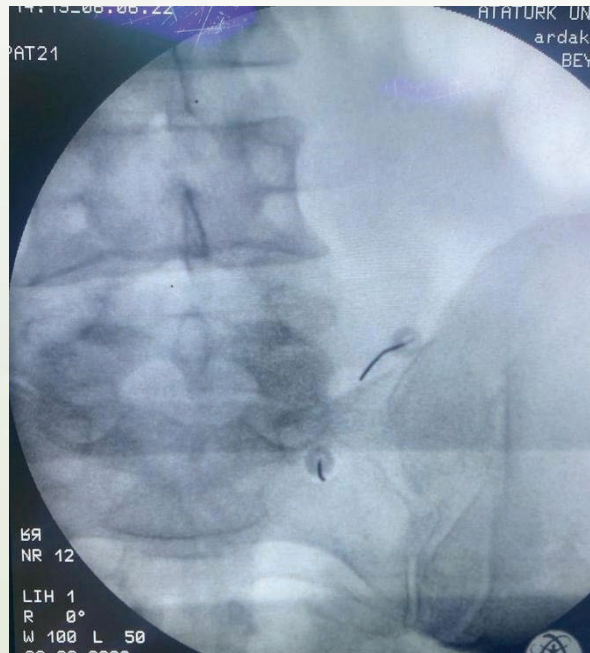
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**Aim:** Patients with lumbar disc herniation (LDH) presented with radicular pain, low back pain and sciatica clinic. There are many options in the treatment of LDH. Patients who do not get adequate results in conservative treatment receive invasive treatment. The aim of the invasive treatment to be chosen is less trauma, maintaining the integrity and stability of the spine, and fewer complications. In this way, the use of transforaminal injection (TFE) as a minimally invasive surgery is becoming widespread. We aimed to analyze the clinical outcomes between TFE procedure and combined TFE and RF procedures with 1-year follow-up data.

**Method:** 460 patients (25-70 years old, BMI 16-38), who were performed in the last two years, participated in our study. Existing patients had sciatica and their complaints continued despite 2 months of medical treatment after refusing surgical treatment. The present clinical picture of the patients was confirmed by MRI. Patients with additional pathology other than single-level disc herniation were not included in the study. Patients were grouped as TFE (Group T, n=220), combined (Group K, n=240). RF and TFE were performed in the operating room in the prone position and accompanied by c-arm fluoroscopy. Visual analog scale (VAS) and Oswestry disability index (ODI) results were compared before the procedure and 1,6,12 months after the procedure.

### TFE AND RF PROCEDURE MADE WITH C-ARMED SCOPY





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Table 1

	Group T ( n = 220)	Group K ( n = 240)	t/x2	p value
Male/ Female	94/126	106/134	-0,048	0,826
Age	64,70 ± 14,23	65,54 ± 16,06	-0,419	0,675
BMI (kg/m2)	24,48 ± 5,05	24,43 ± 5,20	0,077	0,939

Since  $P > 0.005$ , there was no significant difference in the male-female ratio, age difference and BMI in the group.

**Results:** After the study, it was observed that there was no significant difference in VAS and ODI scores in both groups before the procedure ( $p > 0.005$ ) and significantly decreased after the procedure ( $P < 0.005$ ). It was observed that the VAS and ODI scores measured between the two groups at the 1st month after the procedure were not statistically significant ( $p > 0.005$ ). However, VAS and ODI scores in Group K were significantly lower and statistically significant at 6 and 12 months after the procedure than in Group T ( $p < 0.005$ ). In addition, 20.4% ( $n=45$ ) of Group T patients underwent surgery within one year after the procedure, 14.5% ( $n=35$ ) of Group K patients underwent surgery within one year after the procedure. Those who underwent surgery and those who could not be followed up were not included in the study.

**Conclusion:** Studies have shown that LDH symptoms of TFE and RF, which are minimally invasive procedures, can be relieved, and a long-term analgesic effect is provided when RF is added to corticosteroids and local anesthetics

**Keywords:** lumbar disc herniation, transforaminal injection, Radiofrequency ablation



**S-096**

## **LONG-TERM RESULTS OF PATIENTS WITH SPINAL STENOSIS WHO UNDERWENT ISOLATED LAMINECTOMY**

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**Aim:** spinal stenosis is usually old people's disease. With age, chronic diseases generally come along with spinal stenosis. Because of all this reason, it has a high anesthesia risk levels. Operation time and amount of bleeding are also the factors that increase risk of surgeon. In our study, in order to perform surgery as soon as possible without interbody fusion, we perform isolated laminectomy and doraminotomy. We aim to show this patients long term results and despite almost routine procedure, we want to show that surgeons will be successful without interbody fusion.

**Method:** Between 2018-2021 11 years, in Gülhane research and training hospital, operated and controlled post-op terms at least 2 years, 70 patients included in this study. All of patients performed posterior instrumentation and laminectomy to stenosis levels. None of patients performed interbody fusion. Patients followed at least 2 years

**Results:** None of patients are seen broken rod and pseudoarthrosis. Two of them stayed one night in intensive care unit, other patients post-op observed in clinic. All of patients mobilized post-op first day. Patient's approximate stayed in hospital period is 4 days. Posterior junctional kyphosis occurred six of patients and it conceived osteoporosis, senility and short fusion levels. Three of patients whom fusion level is S1, it happened loosening. One of patients fusion levels lowered at iliac wings line. Two of patients are still observed in our clinic

**Conclusion:** Spinal stenosis surgery must performed as soon as possible and most effective way because of factors depends on patients and in this patients, decompression is a main purpose. It is possible to reach main goal with decompression without interbody fusion so that operation time will be shortened as well as morbidity rate will be reduced. Short level fusion and decompression are the comfortable treatment in terms of patients

**Keywords:** laminectomy, spinal stenosis



**S-097**

## **TWO DIFFERENT APPROACHES IN RECURRENT LUMBAR DISC HERNIA: RE-DISCECTOMY+FORAMINOTOMY OR DISCECTOMY+FORAMINOTOMY+UNILATERAL DYNAMIC INSTRUMENTATION**

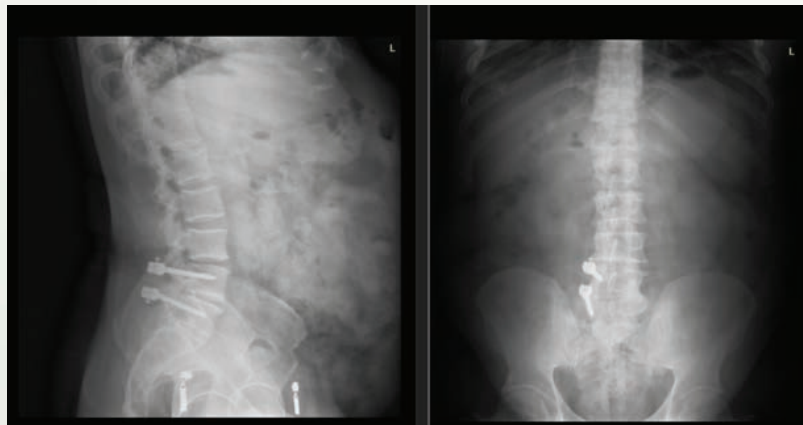
Ali İhsan Ökten<sup>1</sup>, İsmail İştemen<sup>1</sup>, Mehmet Özer<sup>1</sup>, Ali Harmanoğullarından<sup>1</sup>

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**Aim:** Recurrent lumbar disc herniation is one of the most important problems of spinal surgeons. The recurrence rate after Lumbar Disc Herniation (LDH) surgery has been reported to be approximately 5-15%. We compared the two methods we applied to our patients with recurrent LDH in our clinic with different surgical methods. We wanted to evaluate our experience on this subject in the light of the literature.

**Method:** Thirty-two patients who were operated on in our clinic with the diagnosis of recurrent lumbar disc herniation between 2020 and 2022 were retrospectively reviewed. The patients were divided into two groups. The first group consisted of patients who underwent only discectomy and foraminotomy; The second group consisted of patients who underwent unilateral dynamic instrumentation in addition to discectomy and foraminotomy. All patients included in the study; Preoperative, postoperative and first year low back and leg pain were compared in terms of which the VAS score. At the same time postoperative mobilization time, postoperative hospital stay, recurrence rates, and complications rates compared with each other.

### Unilateral Dynamic Instrumentation



**Results:** The first group included 16 patients who underwent discectomy + foraminotomy, and the second group included 16 patients who underwent discectomy + foraminotomy + unilateral dynamic instrumentation. When leg pains in both groups were compared using the VAS score; In the first group, the mean VAS score was 7.4 preoperatively, and 1.6 in the first year postoperatively. While the mean preoperative VAS score was 7.6 in the second group, it was 1.5 in the first year postoperatively. When low back pain was compared, the mean VAS score in the first group was found to be 3.8 before the operation and 4.2 on the 1st day after the operation; preoperative



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mean of 3.6 in the second group; The 1st day after surgery was found to be 4.8. When the VAS score was evaluated in terms of low back pain in both groups in the first year follow-up; the VAS score of the first group was 3.9; The second group was found to be 2.8.

**Conclusion:** When both groups were compared, the VAS score of the 2nd group was found to be higher in terms of early period low back pain, and the VAS score of the 2nd group was found to be lower at the end of the first year compared to the 1st group. The postoperative VAS score in terms of leg pain was found to be close to each other between the 1st and 2nd groups.

**Keywords:** Recurrent Lumbar Disc Hernia, Unilateral Dynamic Instrumentation



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## FATTY INFILTRATION OF THE ERECTOR SPINAE AT UPPER LOW BACK COULD BE A LANDMARK FOR LOW BACK PAIN

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**Aim:** Intervertebral disc degeneration (IVDD), Modic changes, and fatty infiltration in the paraspinal muscles are possible causes of low back pain (LBP). The most blamed paraspinal muscle in the etiology of LBP has been the multifidus. However, multifidus contributes 20% of the extensor moment on lower back. In the present study, we aimed to identify whether patients with LBP and asymptomatic subjects differed in terms fatty infiltration in their paraspinal muscles together with assessment of intervertebral discs and vertebral end-plates.

**Method:** Consecutive female and male patients, who presented to outpatient spine clinics with chronic LBP and had lumbar spine MRI for their LBP without leg pain were included. Asymptomatic subjects without LBP/leg pain for the last year were recruited. Modic changes, IVDD, and fatty infiltration in the paraspinal muscles were evaluated on lumbar spine magnetic resonance imaging of patients with LBP and age-, gender- and BMI-matched asymptomatic controls.

**Results:** Low back pain was closely associated with fatty paraspinal muscles at all lumbar levels, severe IVDD and Modic changes at lower lumbar levels. The fattiest paraspinal muscles in the asymptomatic subjects and in patients with LBP were the multifidus at the lower low back, whereas the erector spinae was more severely fatty infiltrated at upper low back of the patients.

**Conclusion:** Since even asymptomatic subjects have fatty multifidus, fatty infiltration could have started in the multifidus and the subjects might have LBP as the erector spinae gets fatty, significantly more at the upper low back.

**Keywords:** low back pain, disc degeneration, Modic changes, paraspinal muscle, fatty infiltration



S-099

## A PROMISING POST OPERATIVE PREDICTION OF DECOMPRESSION OF STENOSIS IN WITH INCOMPATIBLE CLINIC AND RADIOLOGIC IMAGES

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**Aim:** Some of the patients who undergo surgery for spinal stenosis from time to time have residual symptoms and low function and health-related quality of life for some time after surgery . When we realized that postoperative some cases are not happy after UBE ( UNILATERAL BIportal), we wanted to find out a promising predictor for the patients' post operative prognosis. In this way, we could determine the number of decompression levels more objectively and more accurately in multilevel spinal stenosis. There may be errors in determining decompression levels. Duration of leg pain exceeding 2 years predicted inferior outcome in terms of leg and back pain, function, and HRLQoL(health related quality of life). Preoperative users of analgesics had higher levels of back pain at follow-up than those not using analgesics. Low preoperative function predicted low function and dissatisfaction at follow-up. Low preoperative HRLQoL scores predicted a high degree of leg and back pain. Narrow dural sac area predicted more gains in terms of back pain at follow-up and lower absolute leg pain. These are well known prognostic factors. The aim of this study is to accurately determine the pathological levels in a patient group who complains of low back pain in standing position and does not have pain in the supine lying position.

**Method:** We enrolled 23 patients who had low back pain in standing position while they did not have pain in the supine lying position and undergone UBE in our department. The EMG study of all patients were done in both standing and lying position. Transcortical magnetic motor evoked stimulation potentials were recorded.

**Results:** For all patients the amplitudes of motor evoked potentials decreased in all decompression planned levels. Also, after evaluating standing EMG procedures we changed decompression levels in 17 patients.

**Conclusion:** To avoid decompression errors standing EMG could determine the decompression levels in UBE.

**Keywords:** spinal stenosis, decompression, minimal invasive



S-100

## OSTEOPOROSIS COULD BE ASSOCIATED WITH FATTY PSOAS AT UPPER LUMBAR LEVELS: A POSSIBLE MECHANISM UNDERLYING PROXIMAL JUNCTIONAL DISORDERS

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**Aim:** World population ages and degenerative spine disorders (DSD) become more prevalent with aging. Even though conservative management is the choice of treatment in patients with DSD, surgery is indicated when conservative management fails. Junctional disorders including proximal junctional kyphosis (PJK) (10-45%) and proximal junctional failure (PJF) (0-39.3%) are common unfavorable consequences following surgery for DSD. Osteoporosis is one of the known risk factors for junctional disorders. Further information regarding bone hemostasis and paraspinal structures is required to enlighten the etiology of junctional disorders. We aimed to identify whether osteoporosis was associated with intervertebral disc degeneration (IVDD), Modic changes, and fatty infiltration in the paraspinal muscles at all lumbar levels.

**Method:** Subjects who visited outpatient clinics with chronic low back pain (> 6 months) and had bone mineral density (BMD) measurement. The IVDD, Modic changes and fatty infiltration in the paraspinal muscles at all lumbar levels were compared between osteoporotic and nonosteoporotic subjects. Age- and gender-matched osteoporotic and non-osteoporotic subjects with chronic low back pain were evaluated in terms of IVDD, Modic changes, and fatty infiltration in the multifidus, erector spinae, and psoas at all lumbar levels. We analyzed the data and made-up age- and gender-matched groups according to T-scores measured on Dual Energy X-ray Absorptiometry (DXA) at the lumbar spine (1-to-2 match) and the femoral neck (1-to-3 match), separately.

**Results:** Patients with osteoporosis at the lumbar spine had lower Pfirrmann scores at L2-L3 level than those without osteoporosis. Patients with osteoporosis at the lumbar spine had fattier psoas muscles at L1-L2, L2-L3, and L5-S1 levels whereas those with osteoporosis at the femoral neck had fattier psoas muscles at only L1-L2 level.

**Conclusion:** Impaired extension of the upper lumbar spine due to fatty psoas could be the underlying mechanism of junctional failures following surgery for DSD in patients with osteoporosis. We strongly recommend the assessment of paraspinal muscles, particularly the psoas, as an inevitable part of preoperative planning in patients with DSD and osteoporosis.

**Keywords:** paraspinal muscles, osteoporosis, degenerative spine disease, spine surgery



S-101

## RETROSPECTIVE EVALUATION OF 39 CHIARI MALFORMATION CASES OPERATED IN OUR CLINIC

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**Aim:** Chiari malformations Classification is made according to radiological imaging and anatomical defect. Chiari Malformation Type 1 (CM1); It is defined as the herniation of the cerebellar tonsils more than 5 mm from the foramen magnum to the inferior, and it has been reported in some sources that the patient may have a Chiari malformation even if there is no herniation. In Chiari type 2, open congenital midline defects with cerebellar tonsils, herniation of the brain stem and 4th ventricle from the foramen magnum are seen. Chiari Malformation Type 3 (CM3); The cerebellum and brainstem herniate into an encephalocele sac located in the occipital or upper cervical region. Chiari type 4; There is cerebellar hypoplasia-aplasia, there is no tonsillar herniation, it is an outdated diagnosis. Chiari type 5; cerebellar agenesis and herniation of the occipital lobes. Chiari Type 0; syringomyelia without herniation, Chiari type 1.5; is the herniation of the cerebellar tonsils and brain stem from the foramen magnum without a midline defect. The most common symptom in CM1 patients is headache. Other most common symptoms are neck pain, numbness-weakness in the arms, ataxic gait, and visual disturbances.

**Method:** Patients with Chiari malformation who were operated on in our clinic between 2016-2022 were examined in terms of age, gender, symptoms, accompanying deformities, and examination findings. Of 39 patients who were operated; 32 of them were evaluated as CM1, one patient as Chiari type 0, and six patients as CM3. The most common symptom in patients with CM1 was headache (%53,8) and secondarily, numbness in the arms (%51). The most common finding in the neurological examination was upper motor neuron signs. (%38). Neurological examination was normal in 14 (35%) patients. 65% of patients with CM1 had a syrinx cavity. Cervical scoliosis was present in 6 (15%) patients. 3 of the CM3 patients had hydrocephalus.

**Results:** Syringomyelia accompanies in 50-70% of CM1 patients. Radiological follow-up is recommended if the patient is asymptomatic. Surgery is indicated in CM1 patients with syringomyelia and symptoms. However, in the case of syringomyelia or tonsillar herniation alone, the indication for surgery is controversial. Likewise, there are opinions that surgical treatment can be performed in cases where tonsillar herniation is less than 5 mm, if the clinic is compatible with CM1.

**Conclusion:** Evaluating CSF dynamics with CSF flow MR and careful consideration of the patient's symptoms and signs will help neurosurgeons in choosing treatment.

**Keywords:** Chiari Malformations, Arnold Chiari



S-102

## EVALUATION OF THE EFFICACY OF ANTERIOR CORPECTOMY AND LAMINOPLASTY TECHNIQUES APPLIED IN CERVICAL SPONDYLOTIC MYELOPATHY ON RADIOLOGICAL IMPROVEMENT

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**Aim:** Cervical Spondylotic Myelopathy (SSM) is a clinical picture that can cause many symptoms such as neck-arm pain, loss of balance, inability in fine motor movements, weakness, urinary incontinence and should be treated surgically. Both anterior and posterior approaches such as corpectomy and laminoplasty are applied in the surgery of SSM. In this study, we aimed to measure and analyze 6 different radiological parameters in 45 patients who were operated with both surgical techniques with the diagnosis of SSM.

**Method:** This study was performed retrospectively on 45 patients, 33 men and 12 women, who underwent corpectomy and laminoplasty with the diagnosis of SSM. Anterior corpectomy was performed in 21 patients and laminoplasty in 24 patients. Preoperative and 6 months postoperative cervical computed tomography (CT) and cervical magnetic resonance (MR) imaging of the patients were examined. Sagittal vertical axis, cervical cobb angle, cervical tilt, cranial tilt, Harrison posterior tangent curve and Jackson stress test were measured before and 6 months after surgery. The obtained data were statistically analyzed with the GraphPad Prism 8.01 software, both their effectiveness on SSM and the comparison of both surgical techniques with each other.

**Results:** When the data before and 6 months after the operation in patients who underwent corpectomy were examined, the Harrison posterior tangent curve decreased from  $24.32 \pm 2.47$  to  $17.42 \pm 2.52$ , the sagittal vertical axis increased from  $19.90 \pm 2.14$  to  $28.10 \pm 2.66$ , and the cranial tilt increased from  $6.61 \pm 1.18$  to  $12.24 \pm 1.62$ . These data were statistically significant (Figure 1). In patients who underwent laminoplasty, the Harrison posterior tangent curve decreased from  $28.42 \pm 2.28$  to  $21.58 \pm 2.45$ , the sagittal vertical axis increased from  $18.21 \pm 2.43$  to  $25.42 \pm 2.62$ , and the cranial tilt increased from  $6.83 \pm 1.39$  to  $12.13 \pm 1.37$ . These data were statistically significant (Figure 1). There were improvements in cervical cobb angle, cervical tilt, and Jackson stress test in both techniques compared to the past, but these data were not statistically significant.



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Figure 1

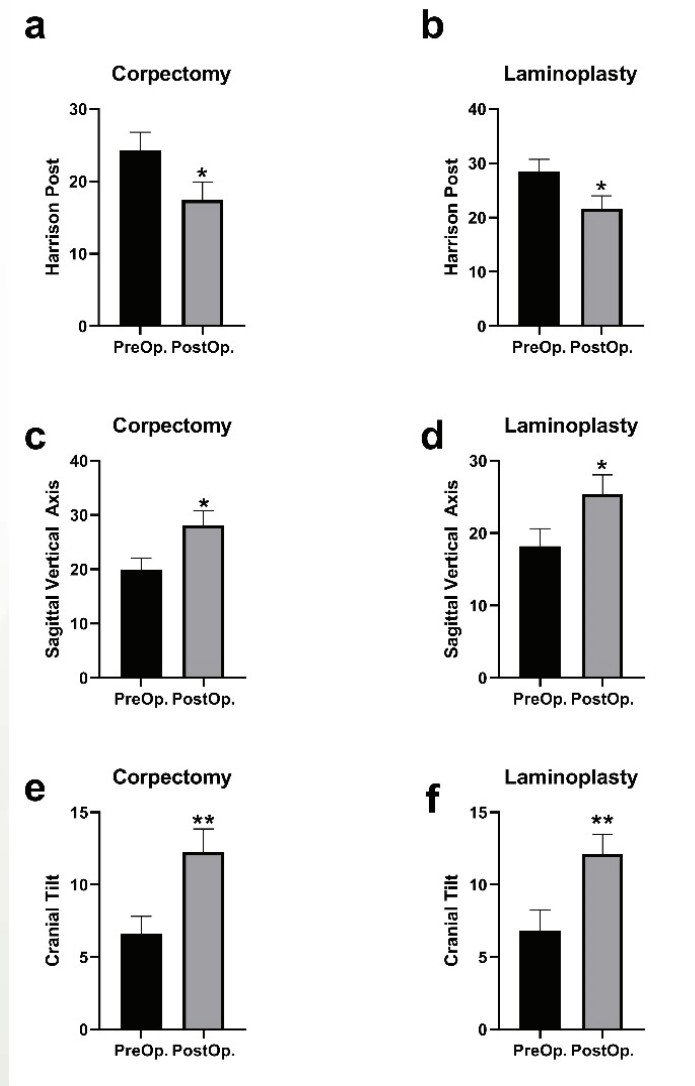


Figure 1. Comparison of different radiological measurement parameters in pre-operative and post-operative patient groups. a-b) Harrison Post, c-d) Sagittal Vertical Axis, and e-f) Cranial Tilt values in corpectomy and laminoplasty approaches.

**Conclusion:** Corpectomy and laminoplasty techniques are very effective methods in the surgery of SSM disease. In this study, it was seen that both techniques were not superior to each other. We believe that measurements such as sagittal vertical axis, Harrison posterior tangent curve and cranial tilt may be useful for better evaluation of radiological and mechanical improvement in the postoperative follow-up of patients who underwent SSM surgery.

**Keywords:** Cervical spondylotic myelopathy, Corpectomy, Laminoplasty, cervical radiological measurements



## S-103

### BILATERAL TRANSFORAMINAL MICRODISCECTOMY (TFMD) COMBINED WITH PONTE OSTEOTOMY IN THORACAL DISC SURGERY

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<sup>1</sup>Medicana Atasehir Hospital

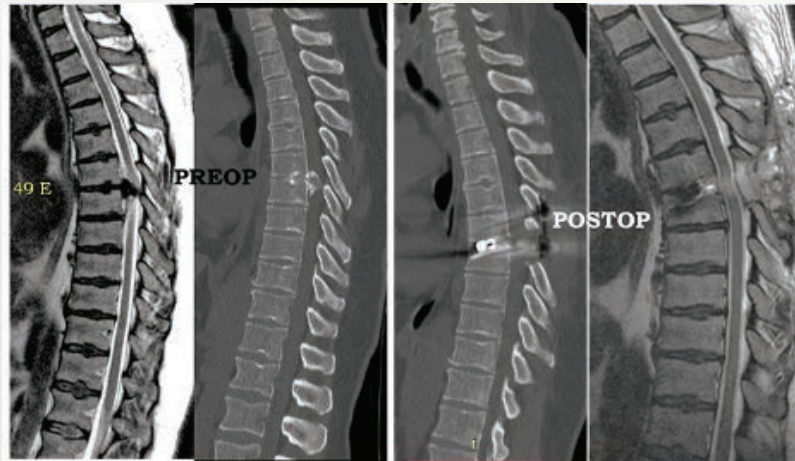
<sup>2</sup>Tuzla Public Hospital

<sup>3</sup>Nörospinal Akademi

**Aim:** The neural complications associated with posterior approaches, and the morbidity and mortality of anterior approaches make the surgical management of thoracal disc herniations, which generally tend to be hard disc or calcified a challenge. In this study, our aim is to present our outcomes with the combined Ponte osteotomy and bilateral transforaminal microdiscectomy technique (PO+TFMD) for thoracal disc herniations.

**Method:** The surgery was performed in a prone position with a median skin incision. The ascending neural roots, caudal and cranial pedicles were exposed via Ponte osteotomy. The operation table was then converted into an extension position in order to reduce the tension on the spinal cord. The intervertebral disc was approached from bilateral foramina via microsurgery and the disc was extracted with a high-speed drill and osteotome. The midline calcified disc was also resected after thrusting it to the exterior. A transforaminal lumbar interbody fusion (TLIF) cage was inserted into the disc space with the bone material harvested from the facets and compressive segmental instrumentation was performed in the extension position. VAS scores were recorded and thoracal kyphosis angles were evaluated via scoliosis X-rays preoperatively, postoperative 1st day, and postoperative 6th month.

The preoperative and postoperative MRI and CT scans of a patient who underwent bilateral TFMD combined with Ponte osteotomy





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**Results:** 18 patients with a diagnosis of thoracal disc herniation were included in this study. 7 patients were female, and 11 patients were male. The mean age was 41.38. All of the patients had a complaint of back pain and paraparesis existed in 12 patients. The duration of surgery was 110 minutes on average and the mean intraoperative blood loss was 450 cc. Preoperative kyphosis angle (T2-T12) was 47.82 and VAS score was 7.35 on average. The postoperative VAS score was 4.16 in the first week, 0.13 at the 6th-month follow-up. The kyphosis angle on the postoperative first day was 39.24 and 40.14 on the 6th month on average. No intraoperative complication was observed in any patients. 2 patients had temporary paresthesia postoperatively. All of the patients were free of pain without any symptoms at 6 months.

**Conclusion:** Ponte osteotomy combined with TFMD is a surgical technique with low complication rates and favorable radiological and clinical 6-month outcomes for patients presenting with back pain and diagnosed with thoracal disc herniation.

**Keywords:** thoracal disc herniation, ponte osteotomy, transforaminal microdiscectomy



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## EFFECTS OF OXIDATIVE STRESS-RELATED BIOCHEMICAL MARKERS ON DISEASE PROCESS IN PATIENTS WITH ADVANCED LUMBAR SPONDYLOLISTHESIS

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**Aim:** One of the most common complaints in clinical practice is low back pain and accompanying spinal degenerative diseases. Oxidative stress is assumed to play an important role in the degenerative process. In this study, the oxidative stress level in the interspinous ligament tissue of patients with spondylolisthesis and the effects of related biochemical markers on the patient's clinic were investigated

**Method:** Patients with degenerative spondylolisthesis, lumbar spinal stenosis, and spinal trauma under the age of 40, who applied to the Neurosurgery clinic at Mugla Sitki Kocman University Training and Research Hospital and diagnosed with surgery were included in this study. Interspinous ligament tissue samples, which were removed during surgical decompression and turned into medical waste, were used from all patients whose written consent was obtained. These patients were divided into three groups as lumbar spondylolisthesis (LSL) patients (n=14), lumbar spinal stenosis (LSDK) (n=14) and young trauma patients (n=10). A power analysis of the number of patients yielded an 80% confidence level and a 5% margin of error. Superoxide dismutase (SOD), total sulfhydryl, and AOPP levels were determined using a spectrophotometric method in the collected interspinous ligament samples.

**Results:** In our study, SOD enzyme (p=0.496) activity, total sulfhydryl (p=0.260) and AOPP (p=0.365) levels were not found statistically significant between the groups. Although there was no statistically significant difference, when we analyzed the SOD values, it was found that the lowest value was in the trauma group and the highest value was in the LSL group. The total sulfhydryl values also showed that the LSDK group had the highest values and the trauma group had the lowest. While AOPP levels were highest in the trauma group, they were the lowest in LSL patients.

**Conclusion:** In this study, oxidative stress markers were studied for the first time in interspinous ligament samples. Although results were not statistically significant; The high SOD and total sulfhydryl values as well as the low AOPP values, implying that it may play a protective role in the ongoing inflammatory process in these degenerative diseases. Further studies in a large patient group are needed to understand the effects of oxidative stress on lumbar spondylolisthesis.

**Keywords:** Lumbar spondylolisthesis, Interspinous ligament, Superoxide dismutase, Total sulfhydryl, AOPP



## S-105

### POSTERIOR CERVICAL FLOATING LAMINOTOMY AND OUR CLINICAL EXPERIENCES

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<sup>1</sup>Bakırköy Mazhar Osman Training and Research Hospital, Neurosurgery Clinic, İstanbul, Turkey

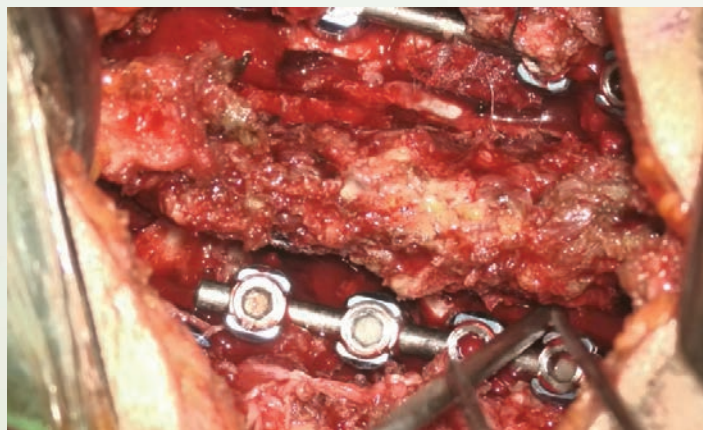
<sup>2</sup>Bakırköy Spine Center, İstanbul, Turkey

**Aim:** Many methods have been described to achieve optimal results in posterior cervical spine surgery. In this study, we shared our clinical experience and results of 25 patients we operated with a newly defined Posterior Floating Laminotomy (PFL). PFL can be used in trauma, degenerative spine disease, spinal diseases with cervical myelopathy and tumors. PFL aims to prevent the formation of a postlaminectomy membrane and to prevent complications that may occur during surgery by preserving the posterior midline structures after bilateral laminotomy.

**Method:** Preoperative cervical MRI, cervical CT, cervical radiography, cervical angiography were performed on 25 patients who were operated with Posterior Floating Laminotomy in our clinic between 2016-2022.

**Results:** The mean preoperative cervical lordosis Cobb angles of the patients we operated on in our clinic was 1. The mean postoperative cervical lordosis Cobb angles was 8.5. The mean preoperative mJOA was 13.8. The mean postoperative mJOA was 16.8. The mean preoperative VAS scores were 8. Postoperative VAS score averages were 3. The Cobb mean of the 1st year postoperatively was 5. The number of patients who developed fusion in the 1st year postoperatively was 25. 19 patients were SSM and 6 patients were OPLL. None of the patients had dural injury during surgery. C5 palsy developed in 4 patients. All patients who developed C5 palsy recovered after physical therapy. Post laminectomy membrane did not develop in any of the patients in the MRI scans performed in the 1st postoperative year. The mean follow-up period of the patients was 16 months (12-72 months).

PFL



posterior tension band and dura mater after posterior floating laminotomy



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**Conclusion:** Compared with other methods for posterior cervical fusion, PFL reduces the risk of dural injury and neurological deficit during surgery. Considering the long-term results, both the post laminectomy membrane and narrow canal clinic reoccur in patients who underwent total laminectomy, and insufficient fusion occurs when compared to PFL. PFL is a safe surgical method that can be used for suitable patients. Since laminotomy was performed in the surgery, the spinal cord was not sheared and we prevented neurological deficits that could develop. We also prevented the formation of a post laminectomy membrane with the PFL technique.

**Keywords:** LAMINOTOMY, POSTLAMINECTOMY MEMBRANE, CERVICAL



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## FOR WHOM THE BELLS ARE RINGING?: AN AGE- AND GENDER-MATCHED CROSS-SECTIONAL ANALYSIS OF INFLAMMATORY MARKERS IN PATIENTS WITH LOW BACK PAIN

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**Aim:** Mechanical and inflammatory factors were suggested as the causes of spine degeneration and low back pain (LBP). Previous studies partly reported the association of LBP with inflammation. However, none of them compared patients with LBP and asymptomatic subjects in terms of complete blood count and inflammatory markers in detail. In the present study, we aimed to analyze the association of serum white blood cell (WBC) count, C-reactive protein (CRP) and erythrocyte sedimentation (ESR) with chronic LBP by comparing the patients with chronic LBP and age- and gender matched controls.

**Method:** Lumbar IVDD and vertebral end-plates were evaluated using Pfirrmann grading and Modic classification on lumbar spine magnetic resonance imaging. Serum WBC counts, CRP levels, and ESRs were recorded from subjects' charts.

**Results:** We included 248 subjects. There were 147 patients and 101 asymptomatic controls. Patients with chronic LBP had significantly higher serum neutrophil, monocyte and basophil counts, higher neutrophil-to-lymphocyte ratio, higher ESR and lower serum CRP levels compared to the controls. Serum monocyte and basophil cell counts and ESR were the most remarkable predictive factors for chronic LBP, severe IVDD, and Modic changes. Higher serum monocyte and basophil cell counts and higher serum ESR above cut-off values of  $0.42 \times 10^3/\mu\text{L}$ ,  $0.025 \times 10^3/\mu\text{L}$ , and 3.5 mm/hour could be used as screening tool for subjects with persistent LBP in primary care.

**Conclusion:** Higher serum monocyte and basophil counts and serum ESR above new cut-off values should be alarming to obtain early spinal imaging and prevent chronicity in patients with LBP.

**Keywords:** low back pain; disc degeneration; end-plate; spine; inflammation



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## CHORDOMA, OUR CLINICAL EXPERIENCE: SINGLE CENTER RETROSPECTIVE STUDY

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**Aim:** Chordomas are rare, slow-growing, locally aggressive tumors thought to originate from the embryonal notochord. It can be seen along the entire spine, from the skull base to the sacrum. Although histologically benign, they have high local recurrence rate and rarely metastasize. Radical resection followed by radiotherapy is typically recommended for the treatment of chordoma. In this study, we presented our approach and clinical results in 10 cases whose histopathological diagnosis resulted as chordoma.

**Method:** In our study, 10 patients with chordoma who were operated in our clinic between 2015 and 2023 were evaluated retrospectively. Neurological examination, radiological imaging, and preoperative and postoperative visual pain scale(VAS) of patients with spinal location were evaluated. Preoperative and postoperative neurological examinations and Karnofsky performance scales of patients with cranial localization were compared. The lesion was spinal region in 3 patients and cranial region in 7 patients.

**Results:** Of the 10 patients included in our study, 2 were operated for sacral, 1 thoracic region, 7 clival localized chordoma. 4 patients with clival lesions with visual loss and diplopia. Transsphenoidal resection was performed primarily in 5 patients, followed by transcranial resection in 2 of these patients. Transcranial resection was performed in 2 patients at their first admission. The Karnofsky score was 93(80-100) preoperatively and 95(90-100) postoperatively. CSF leakage, hyponatremia was seen at follow-up. 1 patient died due to Covid-19 pneumonia during follow-up. 6th cranial nerve paresis developed in 5 patients. One of our patient, who was operated for sacral chordoma previously, and was admitted to our clinic with right leg pain. (Preoperative VAS score:7, the postoperative VAS:0) There was no muscle strength deficit and incontinence in the preoperative and postoperative period. One of our patients presented with low back pain, stool and urinary incontinence. The lesion extending from S2 to the coccyx and retroperitoneum was excised. Another spinal chordoma(T11 level) patient, presented with low back pain and weakness in the feet. In the preoperative period, the muscle strength: 2/5 at right lower extremity and 4/5 at left lower extremity. Postoperative muscle strengt: 4/5 in the lower extremities. (Preoperative low back pain VAS:6, and postoperative VAS:3) After 2016 all patients were referred to radiotherapy.



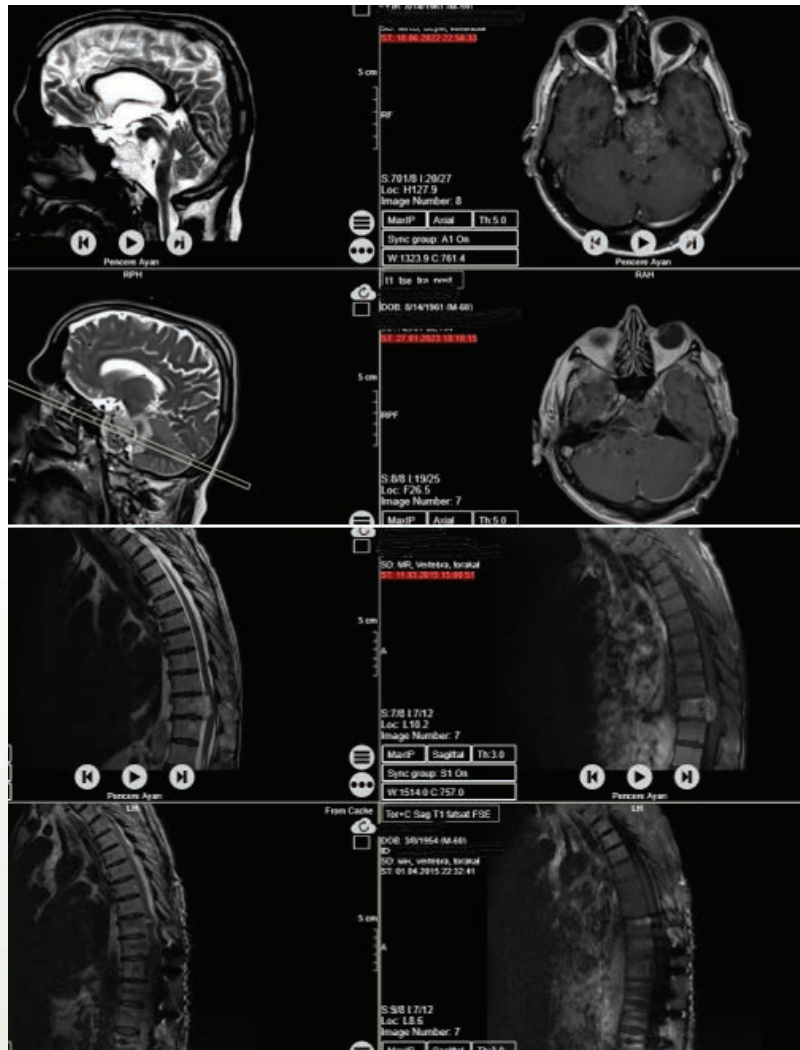
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**Conclusion:** Surgical resection constitutes an important part of the treatment because it responds poorly to chemotherapy and radiotherapy. Survival and local tumor control are highly dependent on wide excision of the tumor with appropriate surgical margins. Studying in larger patient groups will yield more accurate results.

**Keywords:** chordoma, spine, sacral



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## USAGE OF DYNAMIC SYSTEM IN THE SURGICAL TREATMENT OF ADULT SAGITTAL DEFORMITY

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<sup>1</sup>Koc University Hospital

**Aim:** Dynamic systems have been incorporated into spine practice for the last 20 years. They are increasingly being used without fusion, except for acute instability treatment. Although they have been used for a long time in long-segment instabilities, their use in deformity surgery, especially in sagittal imbalance, is quite new. It is possible to correct sagittal balance in patients with good bone quality and those who have not developed fixed sagittal imbalance. Two-stage surgery has been an important step toward the success of the systems in patients with dynamically impaired bone quality.

**Method:** Patients with mobile deformities were selected as ideal candidates for surgery. Considering the etiology of the patients, the deformities of the spine developed as a result of the degenerative process. All patients underwent DXA, MRI, and CT imaging. The presence of scoliosis, kyphosis, and kyphoscoliosis was investigated in each patient and preoperative values were noted. Patients with at least 2 years of follow-up were included in the study. Long segment posterior pedicular dynamic systems were used in all patients for deformity correction.

**Results:** 25 patients with a mean age of  $62.92 \pm 10.80$  (min=41-max=79) were included in the study. Seventeen (68%) of the patients were female and 8 (32%) were male. The Dynesys system was used in 19 (76%) and the Orthrus system was used in 6 (24%) patients. There was a significant difference in VAS and ODI scores between measurements over time ( $p < 0.001$ ). Scoliotic Cobb ( $p = 0.001$ ), thoracic kyphosis angle ( $p = 0.013$ ) and SS ( $p = 0.008$ ) values of the patients decreased significantly in the postoperative measurements. Except for subcutaneous hematoma, no serious complications were encountered in the patients. No loosening was detected in cases.

**Conclusion:** When any of the screw or rod systems are used as a dynamic system, less stress formation on the screw becomes possible. In addition, balancing the graft under the load (Wolf law) is one of its important advantages over rigid screw systems. As a result, successful results have been obtained in two-stage surgeries with the dynamic system in adult mobile deformities, and it is a method that can be considered to be preferred because it is easier to perform compared to fusion and rigid instrumentation surgery. From this point of view, it can also be used in mobile adolescent idiopathic scoliosis surgery.

**Keywords:** Deformity, Sagittal imbalance, Dynamic Systems, Stabilization



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## SPINAL TRAUMA AFTER EARTHQUAKE

Gulyara ÇİĞDEM<sup>1</sup>

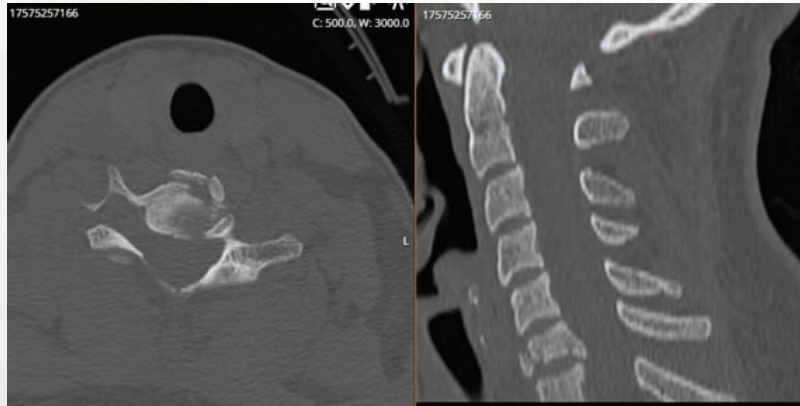
<sup>1</sup>Harran Üniversitesi Tıp Fakültesi, Beyin ve Sinir Cerrahi Ana Bilim Dalı, Şanlıurfa, Türkiye

**Aim:** The aim of this study is to evaluate and to analyze the types, levels and complications of spinal casualties of massive earthquake which hit 11 regions of Turkey on 6 February 2023.

**Method:** This is a retrospective study of casualties with spinal traumas who were admitted to Harran university between 6- 26 of February 2023 after the earthquake. Inclusion criteria was all patients who had cranial or spinal injuries and patients who had other injuries were excluded from this study.

**Results:** The total number of patients was 562, of which 43 had a spinal or cranial trauma. There were male 22 (51,2%), female 21 (48,8%). Patients with cranial trauma were 13 (30,2%), with spinal trauma were 29 (67,4%) and 1 (2,3%) patient had a mix trauma. 5 (11,6%) patients had cervical injuries, 4 (9,3%) had thoracic injuries and 1 (2,3%) had cervical and lumbar injuries. We observed that the 13 (30,2%) of patients had a compression of the corpus of vertebra, 15 (34,9%) had a fracture of the processus of vertebra and 4 (9,3%) had a burst fracture of the corpus of vertebra.

CT of the burst fracture of C6



**Conclusion:** It is important to triage the patients according to type of the injuries to prevent morbidity and mortality in patients with major trauma after sudden massive disasters.

**Keywords:** earthquake, spinal trauma, cranial trauma, Turkey



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## EVALUATION OF DEMOGRAPHY AND PATHOLOGIES OF PEDIATRIC AGE GROUP SPINAL TUMORS ACCORDING TO THE LITERATURE

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**Aim:** The incidence of primary spinal tumors is approximately 2 in 100,000. Tumors associated with the spinal cord and spinal cord are seen in extradural, intradural-extramedullary and intramedullary types. In our study, we evaluated the pathologies and demographic characteristics of our patients in the pediatric age group according to the literature.

**Method:** We included 38 patients in the pediatric age group, who were diagnosed with spinal tumor and operated by our clinic, who applied to the Neurosurgery Clinic of Ümraniye Training and Research Hospital with complaints such as pain, numbness and loss of strength between 2009 and 2021.

**Results:** Twenty-two of our patients were boys and 18 were girls. The mean age was 11.75. The patients' weighty complaints were pain and numbness. When we look at the distribution of spinal tumors, 13.8% intradural-extramedullary, 23.6% intramedullary, 60.5% extradural. When we look at the anatomical localization, 15 thoracic, 12 cervical, 11 lumbar pathologies are examined, the pathology of 6 patients is osteoblastoma, 3 patients are meningioma, 5 patients are ependymoma, 3 patients are neurofibroma, 2 patients are astrocytoma, 2 patients are schwannoma, 3 patients are lymphoma, 3 patients are aneurysmal bone cyst, 1 It was distributed as dermoid in 1 patient, epidermoid cyst in 1 patient, ganglioneurinoma in 2 patients, ganglioneuroblastoma in 1 patient, neuroblastoma in 1 patient, ependymoma in 1 patient, myositis ossificans in 1 patient, fibrous dysplasia in 1 patient, histiocytosis in 1 patient, and epidermoid cyst in 1 patient. When we look at the distribution of spinal tumors in the pediatric age group in the literature, extradural tumors take the first place in line with the literature. The most common pathology encountered in intradural tumors was astrocytoma and ependymomas.

**Conclusion:** In our study, we examined the complaints, pathologies and demographic characteristics of patients with spinal tumors in the pediatric age group hospitalized in our clinic. We found that the location of the tumors, demographic data and pathological diagnoses of the patients were compatible with the pediatric spinal tumor cases in the literature.

**Keywords:** SPINAL TUMORS, PEDIATRIC, EPENDYMOMA, LITERATURE



## S-111

### THE EFFECT OF DEXTROSE PROLOTHERAPY IN CHRONIC LOW BACK PAIN

Mehmet Yılmaz<sup>1</sup>

<sup>1</sup>Gaziantep 25 Aralık State Hospital

**Aim:** In our study, it was aimed to determine the long-term effects of dextrose prolotherapy on pain, activities of daily living and functional status in patients with chronic low back pain, which is an important health problem.

**Method:** In our retrospective study, 14 patients who applied to Gaziantep 25 Aralık State Hospital Orthopedics outpatient clinic, complained of low back pain lasting more than 6 months, did not respond to traditional conservative treatment methods, had no pathological findings in neurological examination, and had positive results in spinal, ilio-lumbar or sacroiliac stress test. patient was included. Informed consent was obtained by explaining the procedure to all patients. Technically, the classical hacket prolotherapy method was used. A total of 5 sessions of 15% dextrose prolotherapy injections were applied to the lumbar transverse processes, lumbar and sacroiliac ligaments at 0, 3, 6, 9 and 12 weeks by an experienced and authorized investigator. At pre-treatment, post-treatment 1st month, 3rd month and 6th month follow-ups, resting and activity pain intensity by Visual Analogue Scale (VAS), activities of daily living and functional status, Istanbul Low Back Pain Disability Index (IBADI) was evaluated.

**Results:** The mean age of the patients was 49 years (21-70 years), 85% (n=12) were female. The mean body mass index was 27,31 kg/m<sup>2</sup>. The mean VAS Score was 8.8 and the IBADI Score was 41.5. The mean VAS Score at 6 months after treatment was 1.07 and the IBADI Score was 8.5. In patients who received dextrose prolotherapy, there was a significant improvement in resting and activity pain intensity and IBADI scores at the 1st, 3rd and 6th months after treatment compared to before treatment, significant improvement was found(p<0.05).

The Effect of Dextrose Prolotherapy in Chronic Low Back Pain Chart

PATIENTS	AGE	GENDER	BODY MASS INDEX	WHEN IS THE PAIN PRESENT? (WEEK)	PRE-TREATMENT		1st MONTH		3rd MONTH		6th MONTH		PAST SURGERY	ANOTHER DISEASE
					ISTANBUL LOW BACK PAIN DISABILITY INDEX	VISUAL ANALOGUE SCALE	ISTANBUL LOW BACK PAIN DISABILITY INDEX	VISUAL ANALOGUE SCALE	ISTANBUL LOW BACK PAIN DISABILITY INDEX	VISUAL ANALOGUE SCALE	ISTANBUL LOW BACK PAIN DISABILITY INDEX	VISUAL ANALOGUE SCALE		
1	52	F	34,3	8	39	9	35	6	29	5	7	1	MYOMEKTOMY(10 YIL)	HIPOTROİDİ
2	30	M	23,7	4	46	10	39	7	22	4	8	1	(-)	(-)
3	43	F	28,2	2	37	8	25	5	16	4	8	1	KOLESTİKTOMİ	(-)
4	52	F	29,6	1	44	10	28	6	16	3	9	1	HİSTEREKTOMİ(6 YIL)	VERTİGO+DM+HT
5	47	M	23,9	1	36	7	26	6	12	3	9	1	LOVER LIMB AMPUTATION	SLE
6	70	F	30,5	1	50	10	33	7	21	4	15	1	LOMBER ENSTRUMENTASYON(7 YIL)	DM+HT+KAH
7	57	F	30,4	1	46	9	37	6	25	4	14	1	BELDEN 2 KEZ AMELİYAT GEÇMİŞİ VAR	(-)
8	58	F	29,5	3	46	9	31	7	23	3	12	1		HT+DM+HİPERTROİDİ
9	58	F	23,8	4	37	8	19	5	11	3	7	1	APANDİSİT+CTS(5YIL)	(-)
10	21	F	25,7	4	34	9	18	7	9	5	5	1	C'S(1 YIL)	(-)
11	58	F	31,2	2	44	10	22	8	10	5	6	2	LOMBER SURGERY(10 YIL)	(-)
12	66	F	26,2	4	37	8	21	6	9	3	5	1	LOMBER STENOZ	(-)
13	22	F	21,7	12	41	7	21	5	10	3	6	1	(-)	(-)
14	58	F	23,7	2	44	9	31	6	11	4	8	1	(-)	(-)



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**Conclusion:** In our study, it was determined that dextrose prolotherapy in the treatment of chronic low back pain was effective in improving pain, functional status and activities of daily living, and its effect continued in the long term. It is thought that dextrose prolotherapy can be recommended as an effective, safe and economical treatment option in patients with chronic low back pain and suitable indications. There is a need for randomized controlled studies with more patients.

**Keywords:** Low Back Pain, Prolotherapy, IBADI, Visual Analogue Scale



## S-112

### THE EFFECT OF ACCOMPANYING LIMB LENGTH INEQUALITY ON THE SPINE IN PATIENTS WITH POLIO SEQUELAE

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<sup>1</sup>Özel İzmir Ekol Hastanesi

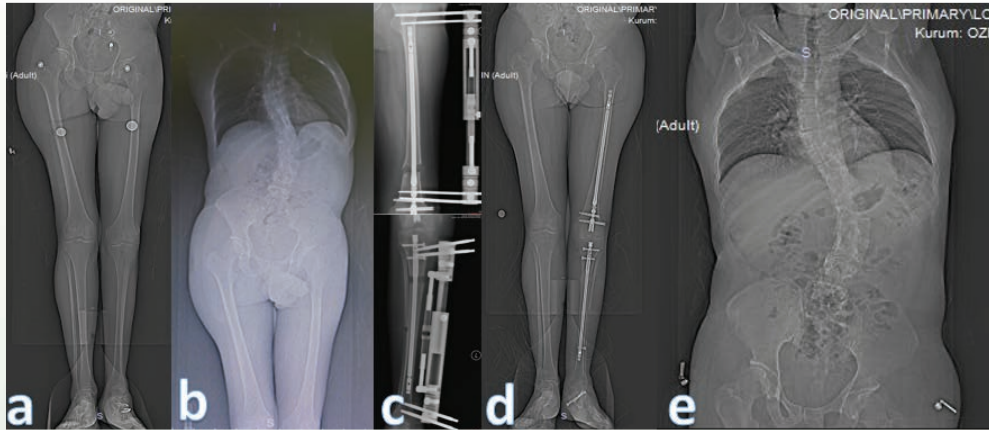
<sup>2</sup>Özel Klinik

<sup>3</sup>Bakırçay Üniversitesi

**Aim:** Although it was an important public health problem in the past, today we encounter polio with its sequelae. Although patients mostly experience lower extremity problems, they may also have accompanying spine problems.

**Method:** Two patients followed up with the diagnosis of polio were included in the study. Both patients had unilateral lower extremity length inequality. Both patients developed spinal problems over time.

figure 2



scoliosis accompanying polio sequelae

**Results:** One of the patients was male and the other was female. Their ages were 43 and 35. A female patient was referred to our clinic because of limb length inequality. The patient had a shortening of 2 cm in the left femur and 4 cm in the tibia. however, due to pain and weakness in the right lower extremity of the patient, L4-5 listesis and disc protrusion were detected in the MRI evaluation. The patient underwent laminectomy, disc excision and fusion with cage L4-L5 posterior spinal instrumentation. The patient's complaints regressed. The male patient had previously been operated for scoliosis. However, the implants were removed due to the inability to walk after the operation. The patient was referred to our clinic because of lower extremity length inequality and foot deformity. The patient had a shortness of 2.5 cm in the femur, 2.5 cm in the tibia, and a pes cavus. The patient underwent lengthening of the femur and tibia with a fixator-assisted intramedullary nail. Triple arthrodesis was applied for pes cavus. . An uncomplicated recovery was achieved.



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table 1

	Patient no: 1	Patient no:2
Age	43	35
gender	Woman	Male
spine problem	Spondylolisthesis	scoliosis
lower extremity problem	Right femur and tibia shortness	Left femur and tibia shortness and pes cavus
Treatment	Lumbar stabilization	Limb lengthening and triple arthrodesis.
Complication	None	The implants placed for the scoliosis operation were removed.

general characteristics of patients and procedures performed

**Conclusion:** Patients with length inequality in the lower extremities may have spinal problems. Two conditions should be considered when planning treatment.

**Keywords:** polio sequelae, scoliosis, spondylolisthesis



## S-113

### A SIGNIFICANT PROBLEM AFTER SPINAL SURGERY, WHICH SHOULD NOT BE SKIPPED IN POOR PROGNOSIS; TUMORAL LESIONS

Bilal AYKAÇ<sup>1</sup>

<sup>1</sup>Bursa Private Hayat Hospital

**Aim:** Complications are the main concern of physicians in spine surgery. When they occur, they can have consequences that affect patients' quality of life and future independence. However, in some cases, tumoral lesions may cause symptoms that mimic complications, and these lesions should not be overlooked with further investigations and examinations.

**Method:** In this article, we present two cases, one of whom was operated with spinal stenosis in our clinic and the other in an external center, by performing posterior instrumentation and decompression, in whom no lesion to cause complications could be detected as a result of laboratory and imaging studies suggesting complications in the early postoperative period, and a tumoral mass was diagnosed by additional imaging studies.

**Results:** First case, a 56-year-old female patient, who was operated for spinal stenosis in our clinic, was admitted with complaints of urinary incontinence and low back pain on the 45th day, despite the significant regression of the patient's complaints in the early period, who underwent posterior instrumentation and laminectomy. Neurological examination was found normal. Since no lesion was observed in laboratory and imaging examinations (x-ray, computerized tomography (CT), and magnetic resonance imaging (MRI)) to explain the clinic (Figure 1.), a urology consultation was requested considering bladder dysfunction. The patient with ureteral compression was diagnosed with advanced cervical carcinoma. The second case, a 68-year-old female who underwent posterior instrumentation and laminectomy for spinal stenosis one year ago in an external center, her radiculopathic complaints continued and she had difficulty walking in the last six months. On examination, it was seen that the patient had a right drop foot deformity, right quadriceps, and hip flexor muscle strength could not move actively against resistance, and left lower extremity muscle strength was full. It was determined that the distal L1 was hypoesthetic in both lower extremities, prominent on the right. It was stated by the patient that there was no incontinence. Patellar reflexes could not be obtained on both sides. No implant-related malposition and significant nerve compression were observed in CT and MRI examinations. After a high-level thoracic MRI, a well-defined mass in the thoracic range of 9-10 vertebrae with severe pressure on the medulla spinalis was detected, and emergency surgery was recommended to the patient (figure 2).

Figure 1/2

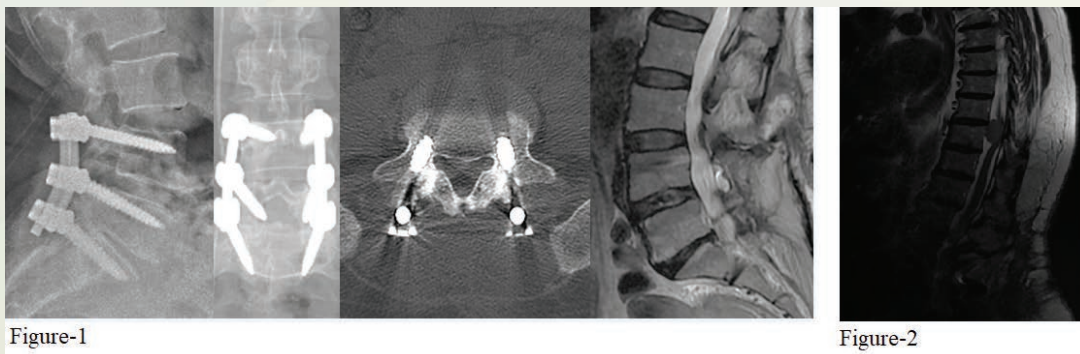


Figure-1

Figure-2



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Figure1: Postoperative radiological images (x-ray, CT, and MRI), Figure2: Thoracic mass detected on postoperative MRI.

**Conclusion:** Although studies on possible complications are primarily carried out in patients whose complaints continue or progress after spinal surgery, tumoral mass, and related compression complications should definitely be kept in mind.

**Keywords:** Postoperative complication, Spinal compression, Spinal tumor



## S-114

### TREATMENT OF A PATIENT WITH PARAPLEGIC L3-4 DISLOCATION AND L4 VERTEBRAL FRACTURE AFTER A PARAGLIDING ACCIDENT: 15-YEAR FOLLOW-UP CASE REPORT

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<sup>2</sup>Ankara Bilkent Şehir Hastanesi, Ortopedi ve Travmatoloji Kliniği, Ankara, Türkiye

**Aim:** In this case report, paraplegic L3-4 dislocation and L4 fracture healing with early surgical treatment after a paragliding accident and a 15-year follow-up is presented.

**Method:** A 26-year-old female patient who fell from a paraglider (10 m) was evaluated 1 h later. The quadriceps and adductor muscle strength of the patient were 0, and sensation was negative in the distal thigh. Babinski reflex, patella, and achilles reflex were negative. Lumbar anteroposterior radiography and computed tomography (CT) images revealed that the L3 vertebra was displaced to the left on the L4, there was a L4 bilateral transverse process and corpus burst fracture, fracture fragments filling 80% of the canal, and lamina and pedicle fractures on the left. Posterior intervention was applied. Bilateral facet excision, L4 total, L3 partial laminectomy was performed. It was observed that the nerve roots were preserved, the dura was torn on the left, and the integrity of the posterior longitudinal ligament was disrupted. Free fracture fragments in the spinal canal were removed, and the dura was repaired. The broken fragments were gently pushed from the left posterolateral to the anterior. Long segment instrumentation and fusion was applied with polyaxial screws.

**Results:** At 24 h after the operation, there was sensory recovery in all the dermatomes on rough touch, and hypoesthesia in L4-L5-S1 on fine touch, and full force up to L3, 3/5 force for L4-L5-S1. On the second day, sphincter control, and patellar and achilles reflexes were present, the drain was removed, and the patient was mobilized with support. On the third day, sensory and motor functions were restored. On the follow-up radiographs and CT images, the fracture was stabilized, the dislocation was reduced, and resorption of the bone fragments in the canal was observed. Canal compression was reduced to less than 50% and resorption of the bone fragments in the canal was observed on the follow-up radiographs and CT images with a 15-year follow-up.

**Conclusion:** The most important factor in the healing of lower lumbar spine fracture dislocations with neurological deficits is early surgical intervention. This case report strongly supported the idea that early surgical intervention should also be performed in patients with complete neurological deficits.

**Keywords:** Lumbar fracture, Paraplegic, Dislocation, Paragliding, Accident



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## C1-2 IMPORTANCE OF 3D EXAMINATIONS AND CASE ANALYSIS IN FUSION SURGERY

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<sup>1</sup>Basaksehir Cam And Sakura City Hospital

**Aim:** The oxypitocervical joint is the first joint region of the spinal axle, cranial to caudal, and contains condyles and c1-c2 spines in the oxypitobasal. It is including half of the axial rotation movement in the neck c1-c2 network. The stability of the joints of this region is important in protecting the important underlying vascular structures from excessive movement. Decompression and fusion of the compressed structures must be provided in the instability of the oxipitoservical joint. We aim to share our clinical results and the importance of the use of 3-dimensional computerized tomography and angiography in pre-operation preparation in c1-2 stabilization surgery, especially to prevent damage to vascular structures.

**Method:** C1-2 stabilization case made at our center between 2021-2023 were retrospective analysis. Before and post-operation imaging of the case, operation indications and short-medium period follow-up

**Results:** When the 21 c1-2 stabilization operations performed at our center between 2021-2023, 7 trauma, 4 mass, 4 deformity, 2 Chiari syndrome, and 4 basillary invaginations were observed. It has been evaluated by contrast computerized tomography-angiography and non-contrast CT examinations before and after the operation. No vascular damage and screw malposition were observed in the follow-up follow-up in the postoperative process.

**Conclusion:** c1 – c2 stabilization operations are risky and require experience due to the anatomic location and the variations of the region. Especially vascular injury that can be seen in these operations can cause serious mortality and morbidity. Various recommendations are also available in the literature to prevent or reduce these complications. Considering the operations we perform in our clinic, in addition to the x-ray or computed tomography examinations performed during the operation, pre-operation planning is performed while in advance vascular and anatomical variations that can be encountered in these cases, to decrease the complications of preparing for the case with 3-sizes of imaging and samples to be made to dominate the existing anatomy and surgical success we think it is important to improve.

**Keywords:** cranioservical junction, deformity, spine



## S-116

### CLINICAL EXPERIENCE OF THE TRAUMATIC PATIENTS OPERATED WITH ANTERIOR CERVICAL CORPECTOMY, ILIAC GRAFT, AND ANTERIOR PLATE FIXATION

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<sup>1</sup>University of Health Sciences İzmir Bozyaka Education and Research Hospital, Department of Neurosurgery

**Aim:** This study aimed to share our clinical experience on patients who underwent fusion surgery at our clinic between 2017-2023. All patients presented with cervical fractures after trauma and were operated with anterior cervical corpectomy, iliac graft, and with anterior cervical plate fixation.

**Method:** 22 patients evaluated with cervical fractures after trauma and were operated with anterior cervical corpectomy, iliac graft, and with anterior cervical plate fixation at University of Health Sciences İzmir Bozyaka Education and Research Hospital between 2017-2023. Demographical, clinical and radiological data of the patients are reviewed retrospectively.

**Results:** The mean age of the patients in this study was 48,2 years. Seven patients were male (30%), 15 patients were female (70%). 18 patients (82%) were operated with anterior approach after compression fractures. 4 patients (18%) presented with cervical dislocation and were operated with anterior- posterior combined approach. Neurological examination and ASIA scores of 22 patients were 6(%27,2) ASIA A, 1(%4,5) ASIA C, 4(%18,18) ASIA D, 11(%50) ASIA E. Traumatic cervical vertebrae fractures were located in C5 (8 patients%36,3), C6(10 patients%45), C7(4 patients %18,1). Revision surgery was performed in 2 patients after graft dislocation between the first and the third month with these two patients. A patient underwent revision surgery after the screw being located in intervertebral disc space. Four patients with ASIA score A was death from pneumonia, tracheoesophageal fistula, infections caused by decubitus ulcers. Cobb angles measured before and after surgery showed no significant differences.

**Conclusion:** The patients operated with decompression and iliac graft at early injury period showed sufficient fusion after 6 months period. Patients with ASIA score D and E had better outcome.

**Keywords:** compression fractures, anterior corpectomy, iliac graft, cervical plate fixation, cervical trauma



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## **SPINO-PELVIC RECONSTRUCTION COMBINED WITH VASCULARISED FIBULAR GRAFT IN THE TREATMENT OF EWING SARCOMA FOLLOWING TYPE 1 INTERNAL HEMIPELVECTOMY**

Bedirhan Albayrak<sup>1</sup>, Altan Aksu<sup>1</sup>, İsmail Büyükceran<sup>1</sup>, Hüseyin Sina Coşkun<sup>1</sup>, Nevzat Dabak<sup>1</sup>

<sup>1</sup>Ondokuz Mayıs University, Faculty of Medicine

**Aim:** In malignant pelvic tumors, a limb-sparing procedure is a more favorable treatment for the patient than hemipelvectomy, but it challenges the surgeon. Following the massive resections in the pelvis, there are significant alterations in gait posture, and secondary scoliosis may occur. Spinopelvic reconstructions are frequently used in these rare conditions to prevent these secondary deformities. These cases present two patients with spinopelvic fixation after iliac wing resection and reconstruction with vascularised fibular graft (VFG).

**Method:** Case-1A 15-year-old male patient applied to the orthopedics outpatient clinic for about two months with low back pain on the left side. He had muscle weakness in the lower extremities, more prominently on the left side. Imaging studies revealed a massive mass in the iliac wing, and the biopsy confirmed the diagnosis of Ewing sarcoma. Case-2 A 16-year-old female patient with pain in the right pelvic region has been admitted to the outpatient clinic. Imaging studies have revealed lytic lesions in the right iliac wing. The biopsy has been performed, and the diagnosis of Ewing sarcoma has been made. Following the neo-adjuvant chemotherapy prior to surgery, iliac wing resection and spinopelvic fixation were planned for both patients.

**Results:** Surgical Procedure After total resection of the iliac wing, the sacrum and the acetabulum were fixed with two spinal pedicle screws. The reduction was achieved with 2 rods, and bone-to-bone (sacrum-acetabulum) contact was established with a VFG harvested from the same side of the patient. All the procedures were performed under neuromonitorization of the spinal nerve roots, especially L5 and the sacral roots. The mean surgical time was 14 hours. The patients did not develop any complications in the clinical follow-ups and mobilized with partial weight in the 1st month and full weight in the 3rd month.

A 16y old Female patient, Postoperative 6th month AP Pelvic radiography





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The photograph shows the 6th month postoperative radiograph of a patient who underwent spinopelvic fixation following right internal hemipelvectomy for Ewing's sarcoma.

**Conclusion:** In pediatric patients, biological reconstruction, such as spinopelvic fixations combined with VFG, should be considered for limb salvage and may prevent secondary deformities after resection of the massive bone. These technically demanding procedures have long-term favorable results, and longer follow-ups are needed.

**Keywords:** spinopelvic fixation, hemipelvectomy, ewing sarcoma, internal hemipelvectomy, ewing sarcoma treatment



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## RETROSPECTIVE ANALYSIS OF 64 PATIENTS TREATED FOR SPONDYLODISCITIS

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<sup>1</sup>Necmettin Erbakan University Meram Faculty of Medicine Department of Neurosurgery

**Aim:** Spondylodiscitis is a term that encompasses vertebral osteomyelitis, discitis and spondylitis. Spondylodiscitis can be pyogenic, granulomatous or parasitic. It can be of endogenous or exogenous origin. Exogenous infection can reach the vertebra and disc through the vascular circulation, and endogenous infections may occur after the operation or after injections. Age, diabetes, cardiovascular diseases, kidney failure (in addition to dialysis), rheumatic diseases, obesity, malignancy, immunosuppressive therapy or chronic steroid use, previous tuberculosis history, IV drug abuse, HIV, livestock and consumption of raw milk/raw milk products are among the risk factors. Spondylodiscitis accounts for 3-5% of osteomyelitis patients over the age of 50.

**Method:** 64 patients with spondylodiscitis assessed between 2019 and February 2023 were analyzed retrospectively. Age, gender, spinal surgery history, time elapsed after surgery, pathogen grown in culture, additional disease and spinal section with infectious involvement were evaluated statistically.

**Results:** Results: 37 (57.8%) of the patients were female, 27 (42.2%) were male, mean age was 60.3. And 31 patients had a history of spinal surgery. The surgical history of 7 patients was over 5 years. Excluding these patients, the mean duration of postoperative spondylodiscitis was 6.7 months. No pathogen growth was observed in any culture (blood, urine, catheter, abscess, wound) of 35 (54.6%) patients. Brucella immunocapture positivity was observed in 7 (10.9%) patients. Coagulase negative staphylococcus (CNS) was observed in the cultures of 5 patients, and Klebsiella growth was observed in 4 patients. Mycobacterium tuberculosis was detected in 4 patients; culture growth was observed in 3 of these patients, intraoperative cultures of one patient did not grow, but Ziehl-Neelsen Acid-resistant bacillus (ARB) was seen in the staining, and the patient was considered to have tuberculous spondylodiscitis. Klebsiella pneumoniae was grown in the cultures of 4 (6.25%) patients. When the patients were evaluated according to the area with spondylodiscitis; it was observed that the most involvement was in the lumbar region, in 35 (54.6%) patients. 5 patients had involvement in multiple segments. 7 patients had surgical treatment.

**Conclusion:** Tuberculosis is the most common cause of spondylodiscitis worldwide. Staphylococcus aureus follows this. Brucella is the most common pathogen in endemic regions. Due to the increase in antibiotic resistance, blood culture and other culture samples should be performed before starting antibiotics. Antibiotherapy, which will be given after the cause is determined, will increase the effectiveness of the treatment. Surgery is indicated in spondylodiscitis in the presence of neurological deficit, spinal abscess, failure in conservative treatment, and instability.

**Keywords:** Spondylodiscitis, Spinal infection, Osteomyelitis



## S-119

### THE STUDY OF THE FACTORS CAUSING LUMBAR ROTATORY SCOLIOSIS WITH ANATOMICAL PARAMETERS

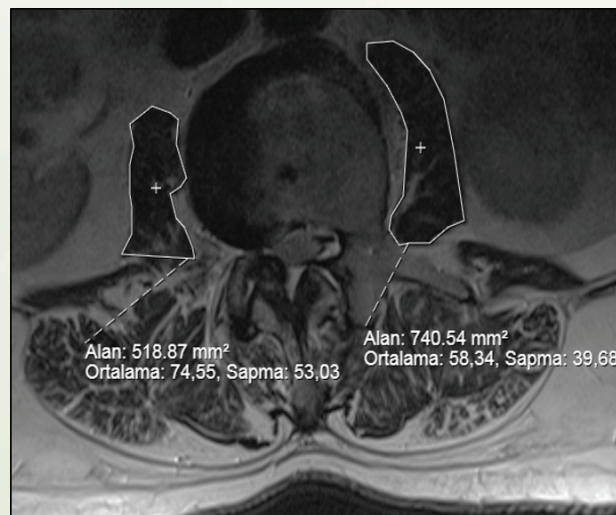
Ş. Berat VURAL<sup>1</sup>

<sup>1</sup>Kepez State Hospital Neurosurgery Clinic

**Aim:** Degenerative lumbar rotatory scoliosis is a health problem which seriously affects the quality of life in elderly people. In our study, we evaluated the radiographs of lumbar spine and lumbar MRI scans of patients who applied to Akdeniz University Hospital Neurosurgery Clinic between the dates of 1st January of 2014 and 20th April of 2019 with the parameters that we defined. We aimed to determine the preventable factors related to abnormal anatomic values and findings and to avoid progression of scoliosis.

**Method:** Twenty patients with severe rotational scoliosis were included in the study. There are 15 patients with normal lumbar region anatomy in control group. We have made a comparison with measurements of several MRI scans that we have defined between the patients with advanced scoliosis in radiographs of the lumbar spine and control group. These parameters are: Psoas muscle cross-sectional area (CSA), paraspinal muscle cross-sectional area (CSA), disc asymmetry measurement, facet joint angle, facet joint crosssectional area (CSA), processus spinosus/corpus vertebrae rotation difference, facet joint/corpus vertebrae distance measure. We have measured that crosssectional areas as square millimeters, distance measures as millimeters and angles as degree. The repeated and controlled measurements have been done with SECTRA PACS program through the archive of hospital. The data analysis is presented with descriptive statistics, frequency, percentage, mean and standard deviation. An independent t test analysis has been used in patients and control group and paired t test analysis for examination of measurements according to the directions. In this study, p-value less than 0.05 was considered as statistically significant.

Psoas muscle cross-sectional area



The cross-sectional area was calculated by measuring the widest area of the psoas muscle in MRI.



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**Results:** It has been shown that psoas muscle CSAs, facet joint CSAs, facet joint angles, facet joint/corpus vertebrae distance measures have significantly lower values than the contralateral side in lumbar MRI scans of patients with scoliosis. It has been observed that the lumbar disc heights in the side of scoliosis have higher values than the contralateral side. There was no significant difference in paraspinal muscle CSA measurements in the comparison of both sides determined.

**Conclusion:** In our study, we consider that scoliosis can be prevented with physical therapy exercise programs and conservative precautions for abnormal anatomical structures which we determined. We believe that prospective studies will be available in degenerative lumbar scoliosis patients in order to better demonstrate the relationship between etiological factors and scoliosis. We believe that prospective studies will be helpful to better demonstrate the relationship between etiological factors and scoliosis in degenerative lumbar scoliosis patients.

**Keywords:** Lumbar Degenerative Scoliosis



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## CLINICAL AND RADIOLOGICAL OUTCOMES OF UNILATERAL STABILIZATION AND DECOMPRESSION SURGERY IN DEGENERATIVE LUMBAR SPINE DISEASE.

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<sup>1</sup>Bakırköy Mazhar Osman Ruh ve Sinir Hastalıkları Eğitim ve Araştırma Hastanesi

<sup>2</sup>Bakırköy Spine Center

**Aim:** Unilateral stabilization and decompression surgery is minimally invasive surgical technique that aims to stabilize the spine, alleviate nerve compression. In this study, we aimed to demonstrate that unilateral stabilization and decompression surgery is effective treatment option for individuals with degenerative lumbar spine disease.

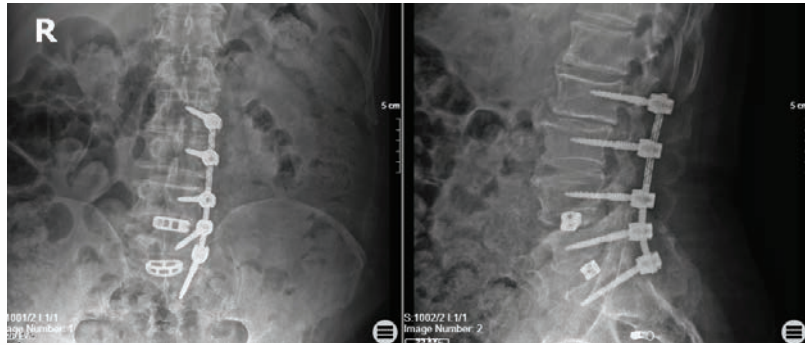
**Method:** Retrospective study, 28patients (18female and 10male) who underwent unilateral stabilization, decompression, and TLIF between January2018 and December2021 were included. Patients with lumbar degenerative stenosis, degenerative scoliosis with Cobb angle less than 30degrees, degenerative disk disease involving multiple levels, and patients with multiple level lateral recess stenosis were included in the study. Patients with grade2 and above spondylolisthesis, degenerative deformities involving the thoracolumbar junction, trauma, tumor patients, infectious diseases, and patients with isolated lumbar disc herniation were excluded from the study. The mean age was 61(32-78) years. Of the 28patients, 18had degenerative lumbar scoliosis, 8 had multiple level stenosis, two had multiple level lateral recess stenosis. The Cobb angle of patients with scoliosis was average of 23(12-28) degrees. The mean follow-up period was calculated 18months (14-62 months). Preoperative and postoperative clinical, functional, radiological data were recorded for all patients. Oswestry Disability Index(ODI), Visual Analog Scale(VAS), Cobb angles were measured and recorded preoperatively, postoperatively. All patients were stabilized unilaterally with transpedicular screws. Unilateral bilateral decompressions were performed at least one level of TLIF was applied to patient at the necessary levels. During surgery, dynamic rods were used in 19patients, hybrid rods were used in 1patient, and rigid rod systems were used in 8patients.

**Results:** Significant reduction in pain severity and improvement in functional capacity were observed in all patients after surgery. The mean preoperative ODI score was 42 and VAS score was recorded as 8. In the early postoperative period, the mean ODI score was 19 and the mean VAS score was 4. Between 6 to 12 months postoperatively, mean ODI score was 11, the mean VAS score was 3. Patients who underwent dynamic rod surgery had statistically significant improvement in VAS score. The mean Cobb angle decreased from 23 preoperatively to 9 postoperatively. Radiologically, spinal canal and foraminal diameters increased postoperatively. Especially at levels where TLIF was applied, disc height was corrected, neural foramina were widened, and lumbar lordosis was improved. Additionally, fusion was observed at all TLIF levels.



S-120

Hybrid rod



**Conclusion:** Results provide evidence supporting unilateral stabilization, decompression surgery as effective option for treating degenerative lumbar spine disease. The use of dynamic rods has been shown to be associated with greater improvement in VAS scores. Significant improvement was observed in pre-and postoperative Cobb angle measurements.

**Keywords:** Unilateral stabilization, degenerative lumbar spine disease, Unilateral decompression



S-121

## SCREWING TECHNIQUE AFTER VERTEBROPLASTY CEMENT IN OSTEOPOROTIC PATIENTS

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**Aim:** Various screws have been designed and new ones are still being designed to increase the stability of the implant in osteoporotic patients who need stabilization. The probability of loosening transpedicular screws in osteoporotic vertebrae is higher than in vertebrae with normal bone density. To prevent these complications, cannulated and doweled screws can be used in osteoporotic cases. In this study, we present the results of 12 patients in whom we could not access these materials for various reasons and in whom we applied instrumentation immediately after sending the vertebroplasty cement.

**Method:** The diagnoses of 12 patients we operated between January 2021 and December 2022 were spinal stenosis, lysis, osteoporotic fracture and vertebral metastasis. 11 of the patients were female and 1 were male. The mean age was 66.3 years. Instrumentation was applied to an average of 4.75 vertebrae, with the levels we stabilized between T10 and S1 vertebrae. Bone densitometry measurements of the patients were found to be osteopenic or osteoporotic. We placed the screws after the cement injection so that the cements do not freeze during the procedure and prevent implant placement. No instrumentation-related complications were observed in any of the patients in our series.

**Results:** In conclusion, we believe that inserting screws into cementum is a safe and effective method in cases where we cannot reach these medical materials for any reason and we will stabilize the osteoporotic vertebra.

**Conclusion:** The disadvantages of the procedure are that the cement cannot be removed in surgical site infections that may occur after the vertebroplasty cement we applied and the screw placement method immediately after, or the difficulties in removing the screws in possible revisions. It is obvious that similar disadvantages exist in cannulated and dowel screws.

**Keywords:** osteoporosis, transpedicular screw, Vertebroplasty

# POSTER SUNUMLAR





## P-01

### PRIMARY BONE LYMPHOMA IN CERVICAL VERTEBRA

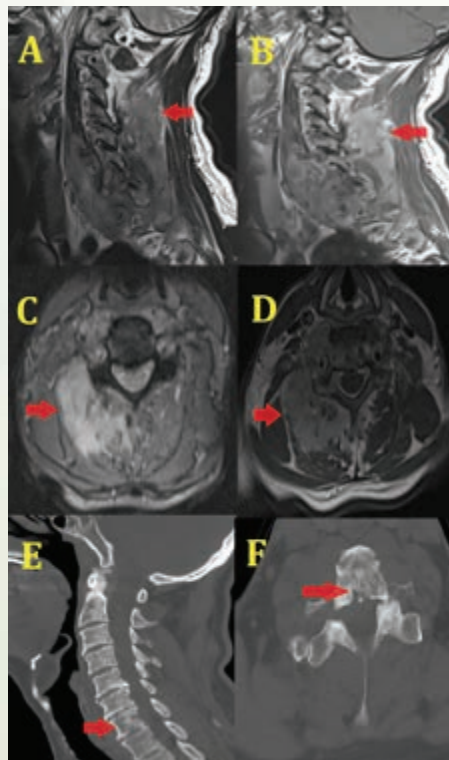
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**Aim:** Primary bone lymphoma is one of the rare tumors in which there is no involvement in the lymph nodes or any part of the body, and the bone is isolated. In this report, we present a case of primary bone lymphoma detected in the cervical vertebra and surrounding soft tissues.

**Method:** In the neurological examination of the patient, who had complaints of pain, numbness and weakness in the right arm for 3 months, right upper extremity muscle strength was 4/5, dtrs were normoactive, and pathological reflexes were not detected. Since the tru-cut biopsy taken from the patient by the hematology clinic did not yield any results, a posterior open biopsy was performed by our clinic. Results: Contrast-enhanced cervical magnetic resonance imaging of the patient revealed a mass in the paravertebral area starting from cervical C3, posterior and lateral on the right, and involving the vertebral corpuscles anteriorly, enhancing and extending into the spinal canal from time to time. Pet-ct imaging revealed a mass at the level of C7-T1 vertebrae, covering all of the vertebrae and extending to the right paravertebral area, showing intense metabolic activity increase (SUVmax: 25.03). There was no tumor involvement in the rest of the body. An open biopsy was performed from the posterior side of the patient by our clinic. The pathology result was diffuse large b-cell lymphoma.

Figure 1





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## P-01

A. Preoperative isointense mass on contrast-enhanced sagittal MRI B. Preoperative slightly hyperintense lesion on T2 sequence sagittal MRI (Red arrow) Mild hyperintense lesion on C.T2 sequence axial MRI (Red arrow) D. Preoperative isointense mass in contrast-enhanced axial MRI (Red arrow) E,F. Preoperative involvement site of the lesion in Computed Tomography Images (Red arrow)

**Results:** Primary bone lymphoma is a rare disease that is difficult to diagnose. The majority of PBLs occur in long bones. About 10% involve the spine. The diagnosis of the disease is difficult and the success of treatment depends on early diagnosis. In the treatment, surgical procedures are applied depending on the compression of the spinal cord, as well as radiotherapy and chemotherapy are effective treatment methods.

**Conclusion:** In this case, after the pathological diagnosis of the patient was made, he was referred to the oncology clinic for radiotherapy and chemotherapy. Although rare, primary bone lymphoma should be kept in mind in cases with suspected hematological malignancy and spinal involvement.

**Keywords:** Spinal Lyphoma, Cervical, B Cell



## P-02

### A CASE OF CERVICAL SPONDYLOMYELOPATHY PRESENTING WITH UNILATERAL DISTAL MONOPARESIS IN THE LOWER EXTREMITY

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**Aim:** Central unilateral distal monoparesis reasons are infrequent and may be misdiagnosed or delayed. Misdiagnosis causes unnecessary treatment. SSMP is an important central cause in patients presenting with lower extremity unilateral distal monoparesis. Drop foot accounts for 15% of adult mononeuropathies and is commonly accompanied by toe dorsiflexion and foot eversion. Unilateral distal monoparesis is usually caused by L4, L5, or peroneal nerve damage. These individuals L4-5 disc herniation on lumbar MRI may lead to the inappropriate treatment for unilateral distal monoparesis. Central unilateral distal monoparesis occurs when the brain and spinal cord's pyramidal tract upper or lower motor neurons are damaged. The literature calls central drop foot spastic foot drop. Cervical myelopathy may also cause central drop foot. Cervical spondylomyelopathy (SSMP) sufferers' quality of life depends on early diagnosis and therapy. We present a patient who had a left lower extremity unilateral distal monoparesis in a SSMP patient.

**Method:** A 51-year-old man had left foot weakness and numbness for 45 days. No pain was reported. He had a left ankle paresis on evaluation. Patient Babinski and Hoffman were positive bilaterally. The patient's deep tendon reflexes were hyperactive and spinal MRI showed L4-5, L5-S1 disc herniation and myelopathy due to canal constriction at the C3-C4 vertebra level. The patient was operated for cervical spondylomyelopathy despite no discomfort and upper motor neuron abnormalities in his neurological exam (SSMP). The patient had posterior cervical stabilization and decompression with C3 and C4 lateral mass screws and total laminectomy. The patient's monoparesis recovered after surgery.

Figure 1





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## P-02

A. Myelopathy appearing hyperintense to the C3-4 level on T2 sequence sagittal MRI (red arrow) B. Myelopathy and stenotic spinal canal appearing hyperintense to the C3-4 level on T2 sequence axial MRI C. Lumbar MRI T2 sequence sagittal image of left L4-5 and L5-S1 lumbar disc herniation D. Lumbar MRI T2 sequence sagittal image of right L4-5 lumbar disc herniation E. Lumbar MRI T2 sequence axial image of L4-5 bilateral lumbar disc herniation F,G. C3-4 posterior segmental stabilization seen on postoperative AP and Lateral cervical radiograph

**Results:** Patients with unilateral distal monoparesis of the lower extremities may have anterior horn cell lesions, plexopathies, stroke, vasculitides, neurodegenerative, metabolic and neuromuscular diseases. Babinski positivity is more common in lower extremity distal monoparesis caused by central organisms than in other upper motor cells. To anticipate surgical success, drop lateral lower extremity distal monoparesis etiology must be understood. Tumor resection, discectomy, and peripheral nerve surgery are surgical alternatives. The location severity, and duration of the paresis affect motor function recovery after surgery.

**Conclusion:** It is crucial to know about the diagnosis and treatment of SSMP. Patients with peripheral nerve diseases like drop foot and no pain should consider central causes. Each patient needs a complete neurological assessment. The specific location of the drop foot is crucial for therapy and prognosis. In drop foot patients, diagnosing radiculopathy, peripheral nerve damage, or neurological systemic illness is difficult.

**Keywords:** Drop Foot, Spondylomyelopathy, monoparesis



**P-03**

**L4-5 SPONDYLODISCITIS WITH FULL CLINICAL AND RADIOLOGICAL HEALING AFTER ANTIBIOTHERAPY**

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<sup>1</sup>Necmettin Erbakan University Medicine Faculty

**Aim:** Postoperative spondylodiscitis is an uncommon nucleus pulposus infection that spreads to the cartilage endplate and vertebral bone after spinal surgery. Antibiotic treatment before and after surgery prevents spondylodiscitis. After surgery for recurrent disc herniation, this patient developed spondylodiscitis and recovered completely with antibiotics.

**Method:** Two months after the second surgery, the 44-year-old female patient who was operated twice for L4-L5 disc herniation and recurrent L4-5 disc herniation returned with low back pain. Old sequelae included 40% muscle weakening in left ankle and thumb dorsiflexion. The wound showed no drainage or irritation. The L4-5 disc and endplates showed partial contrast enhancement and inflammation on lumbar spine contrast-enhanced MRI (Figure 1). Intravenous antibiotics were started. The patient was discharged with a report of outpatient parenteral antibiotics after antibiotics cleared his symptoms and she had no fever at follow-up. Contrast-enhanced cerebral MRI at week 8 of antibiotic therapy showed radiologic improvement without sequelae (Figure 1). The infectious disease clinic withdrew her medications after week 8 because her symptoms had disappeared and her test values were normal.

Figure 1

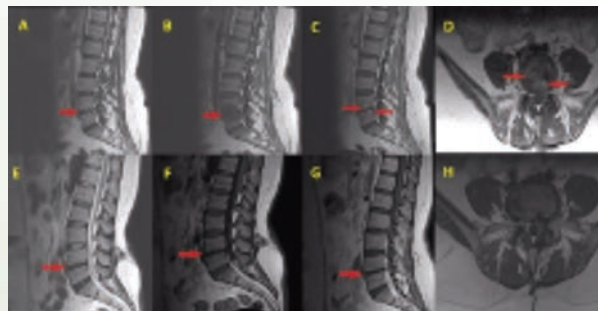


Figure 1A,B : T1 hypointense, T2 hyperintense lesion at L4-5 level in sagittal Lumbar MRI, before antibiotic therapy (red arrow). Figure 1C,D : Contrast-enhanced lesion on T1 MRI sagittal and axial sections, before antibiotic therapy (red arrow). Figure 1E,F : Normal findings on sagittal lumbar MRI sequences, after antibiotic therapy (red arrow). Figure 1G,H : Contrast-Lumbar MRI in which contrast enhancement improves after antibiotic therapy.

**Results:** The incidence of postoperative spondylodiscitis ranges from 0.21 to 3.6%. Unlike bacteria, fungi seldom cause surgical spondylodiscitis. Most cases are caused by *Staphylococcus aureus* (60%) and gram-negative microorganisms. According to the literature, hematogenous spread and surgical inoculation of pathogenic organisms cause postoperative spondylodiscitis. Aging, developmental delay, immunosuppression, spinal injury, and diabetes are unchangeable risk factors. It is possible to modify obesity, smoking, indwelling



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## P-03

catheters, malnutrition, and hospitalization. Infection rates among elderly and spinal-trauma patients are high. In postoperative discitis, inflammation and infection-related edema generate decreased signal intensity on T1-weighted scans and increased signal intensity on T2-weighted imaging (Modic I changes). After gadolinium injection, adjacent bone marrow appears less dense on T1-weighted images. Antimicrobial prophylaxis before and during surgery prevents spondylodiscitis best. Even if there are no standards, intravenous antibiotics should be administered for two to four weeks to improve bioavailability. Less than four weeks of parental therapy increased treatment failure. Spinal immobilization is necessary. The objective of the surgical procedure is to debride and remove the septic focus, collect specimens for microbiological and histopathological testing, decompress the spinal canal, stabilize and fuse the infected spinal segment. Surgical treatment cures inflammation and mobilizes patients more quickly than conservative care.

**Conclusion:** When clinical symptoms are mild, bone damage is minor, or the risks of surgery are high, conservative treatment may be considered. Due to surgical risks, elderly and ill persons prefer conservative treatment.

**Keywords:** Postoperative Spondylodiscitis, Spinal Infections



## P-04

### A CASE REPORT; 13-YEAR-OLD SPINAL EPIDURAL ABSCESS WITHOUT ANY PREDISPOSING FACTORS

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<sup>1</sup>Samsun Eğitim ve Araştırma Hastanesi

**Aim:** Spinal epidural abscess is a rare disease , 2 to 3 per 10,000 hospital admissions, associated with a relatively high rate of morbidity and mortality. A spinal epidural abscess can develop anywhere along the spinal cord in the epidural space; is most often located in the thoracic and lumbar spinal regions. Early diagnosis is essential to prevent permanent neurological sequelae. It should be considered in patients with back pain, fever, neurological deficit and/or spinal tenderness. Emergent surgical decompression and debridement followed by long-term antimicrobial therapy remains the treatment of choice. The most common causative organism is Staphylococcus aureus.

**Method:** A Case report of 13-year-old spinal epidural abscess without any predisposing factors

**Results:** Case Description A 13-year-old male patient who presented with back pain and spinal tenderness for 1 week and had no known disease history, revealed a spinal epidural abscess in the thoracolumbar region on MRI. The patient had no motor deficit, however, there was a complaint of numbness in each leg. The patient was taken to surgical intervention under emergency conditions. T11-12-L1 and L2 left hemilaminotomies were performed to drain the epidural abscesses. The cultures produced methicillin-susceptible Staphylococcus aureus (MSSA). He was treated surgically and with long-term systemic antibiotics. Two months after the operation, her neurological functions completely recovered.

Pre op MRI



**Conclusion:** Spinal epidural abscess is an extremely rare condition in an immunocompetent pediatric patient without risk factors. Although rare, spinal epidural abscess should be considered in every patient with back pain, fever and spinal tenderness, with or without neurological deficit. It is important to diagnose this disease early to prevent sepsis and even death as well as neurological complications.

**Keywords:** spinal epidural abscess, childhood, no predisposing factors



## P-05

### DIFFUSE PNEUMOCEPHALUS AFTER ADULT LUMBAR SPINAL REVISION SURGERY: A CASE REPORT OF AN EXTREMELY RARE COMPLICATION.

Mustafa Buğra Ayaz<sup>1</sup>, Mehmet Kürşad Bayraktar<sup>1</sup>

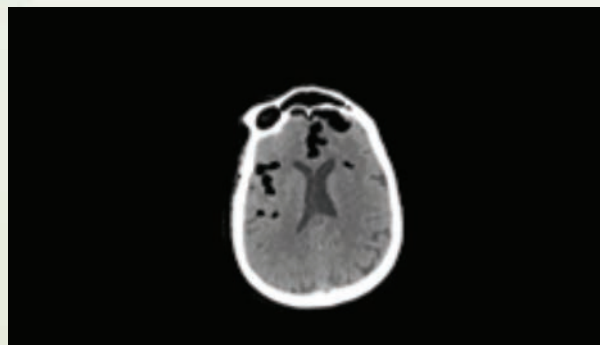
<sup>1</sup>Istanbul Prof Dr Cemil Taşcıoğlu Şehir Hastanesi

**Aim:** The aim of this study was to warn spine surgeons about the possibility and the diagnosis, treatment, and follow-up of pneumocephalus, which is an extremely rare complication after lumbar spinal surgery. Pneumocephalus is defined as the presence of intracranial gas. Tears in the dural sac and cerebrospinal fluid (CSF) leakage during post-spinal surgery may lead to post-operative complications, such as meningitis, arachnoiditis, epidural abscess, delay of wound healing, dural-cutaneous fistula and pneumocephalus. We reported a case of symptomatic pneumocephalus after lumbar spinal surgery without CSF leakage.

**Method:** A 68-year-old female patient who underwent long segment posterior instrumentation for a thoracolumbar degenerative deformity 3 years ago presented with severe back and leg pain. With the diagnosis of spinal stenosis accompanied by bilateral pars defect and instability in the lower lumbar region, it was planned to expand the instrumentation to the caudal vertebrae. As planned, bilateral L5, S1, and iliac screws were placed without touching the old screws and connected with the previous system via the interconnections. No CSF leakage nor screw malposition was not detected intraoperatively. During the rod insertion, the interconnection was connected in a cantilever manner by stretching the old system without removing the whole. A vacuum sound was heard while the force was applied to the rod, but no change was detected in the patient's basal values and neuro monitorization. The patient was awakened in the postoperative intensive care unit and no neurological complications or mental changes were observed.

**Results:** On the third postoperative hour, the patient began to complain of dysarthria, headache, and numbness in the upper extremities. Head computed tomography (CT) scan was performed and it revealed diffuse pneumocephalus. The patient was followed conservatively in the intensive care unit with high-pressure oxygen inhalation, bed rest, hydration, and close monitoring for 5 days. Then physiotherapy was started for balance, walking, and muscle strengthening in the orthopedics service. After the symptoms improved completely, she was discharged on 3rd week postoperatively without a neurological deficit. No further follow-up CT was performed because full clinical recovery was achieved.

Postoperative cranial CT scan





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Postoperative cranial CT scan, axial view

**Conclusion:** Despite its rarity, pneumocephalus, which neurosurgeons are more familiar with than orthopaedists, can be a truly frightening and serious complication when encountered. Especially if unexplained headaches, confusion, and neurological sensory-motor changes occur, the surgeon should be more concerned about pneumocephalus. It should be kept in mind that pneumocephalus may develop even if there is no CSF leakage.

**Keywords:** pneumocephalus, cerebrospinal fluid leakage, CSF, diffuse pneumocephalus



## P-06

### CASE REPORT: PILOMATRIXOMA OF CERVICOTHORACIC REGION

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**Aim:** Pilomatrixoma, also known as calcifying epithelioma of Malherbe, is a benign and rare seen neoplasm that arises from hair cells, particularly hair cortex cells. Pilomatrixoma most frequently seen at the head and neck region, however it can occur any part of the skin which includes hair follicles. The incidence of pilomatrixoma is reported to be between 0.001% and 0.0031% of all dermatopathology specimens and 20% of all pilar lesions. We present a 36-year-old male patient with a pilomatrixoma of the posterior cervicothoracic area operated successfully. 177 patients treated for subcutaneous lesions in our clinic between 2006 and 2022. This is the first case at our clinic that resulted as pilomatrixoma in spinal region.

**Method:** A 36-year-old male presented with a 4-month history of posterior cervicothoracic located, mobile and painless mass. The lesion was progressively growing and approximately 4 cm diameter. The patient had blunt trauma at this region four months ago. The lesion was a subcutaneous nodule that was firm and irregular on palpation. On magnetic resonance imaging (MRI) it was seen at the left side of the spinous processes of C7, T1 and T2 vertebrae. Both T1- and T2-weighted MRI images showed diffusely inhomogeneous areas containing a mixture of low and high signal intensity areas throughout the mass (Figure-1). On ultrasound imaging (US) the lesion was 44x20 mm ovaloid-shaped, heterogeneously hypoechoic solitary mass was seen. Vascularization was observed at central anterior side on US.

**Results:** The lesion was totally excised with the adherent muscle fascia. At macroscopic examination; lesion was yellow-orange colored, covered with a capsule, contains calcification. Histopathologically, the hematoxylin and eosin stained sections from specimen showed a tumor composed of an epithelial component exhibiting the typical population of basaloid and ghost cells and a mesenchymal component showing fibroblastic proliferation. The basaloid cells were characterized by round to oval, hyperchromatic nuclei and scanty cytoplasm. The ghost cells were eosinophilic with a central unstained shadow in the site of the lost nucleus (Figure-2).

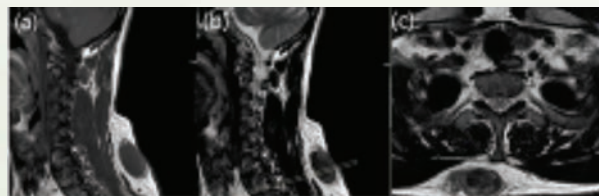


Figure-1

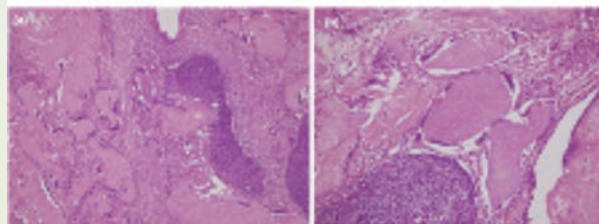


Figure-2



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**Conclusion:** Pilomatrixoma is benign neoplasm that develops from the matrix cells in hair follicles and patients are generally asymptomatic. Malignancy has rarely been reported. Surgical removal is generally curative, recurrence after complete excision is rare. Cytological diagnosis through fine-needle aspiration cytology (FNAC) is often problematic due to misdiagnoses as malignancy. Further studies of this rare disease are needed in order to clarify its natural history and optimize treatment regimens.

**Keywords:** pilomatrixoma, dermal tumours, Cervicothoracic region



## P-07

### A RARE CASE OF PROMARY MULTILOCULAR EXTRADURAL SPINAL HYDATID CYST

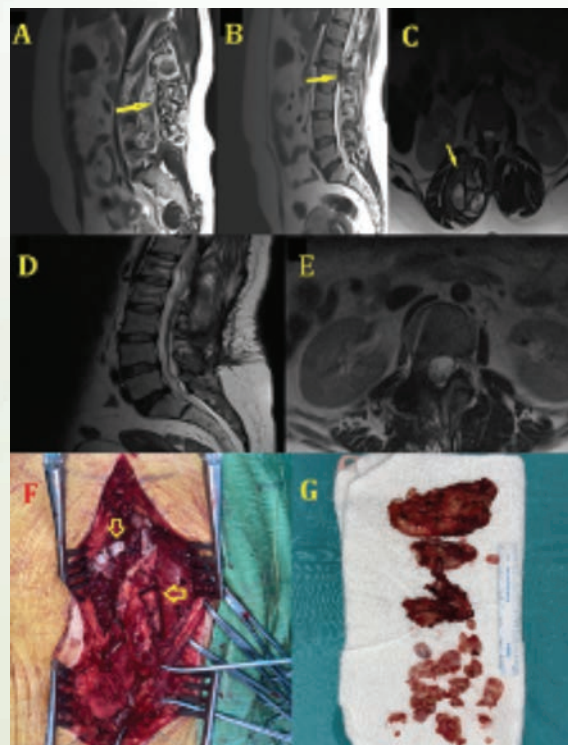
Fatih KARATAS<sup>1</sup>, Büşra GUL<sup>1</sup>, Muhammed Erkam YUKSEK<sup>1</sup>, Mehmet KENAN<sup>1</sup>, Mehmet Fatih ERDİ<sup>1</sup>, Fatih KESKİN<sup>1</sup>

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**Aim:** Hydatid cyst affecting the spine is a rare type of EchinococcusGranulosus. It is common in endemic areas, grows slowly and presents mainlywith symptoms related to spinal cord compression. Therefore, it causessignificant morbidity and mortality. Its treatment is cyst excision, spinal corddecompression and surgery aimed at stabilization.

**Method:** A 33-year-old woman was admitted to our clinic with complaints oflow back, right hip and radicular right leg pain for 1 year. Neurologicalexamination was normal. On MRI, a multicystic lesion with paravertebrallocation was observed in the posterior, narrowing the T12-L1 foramen on theright and extending from the L1-2 foramen into the spinal canal. The patient wasoperated; Right L1 and L2 hemilaminectomy was performed. The paravertebralmuscles and L1-2 extradural hydatid cyst were totally excised, pathology andmicrobiology were sampled. Right unilateral L1 and L2 posteriorinstrumentation was performed. The surgical site was washed with a hypertonic20% saline solution. The patient was discharged after adequate postoperativefollow-up. Pathology and microbiology examination results were consistent withhydatid cyst.

Figure 1





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A. Paravertebral muscle involvement in preoperative MRI sagittal section B. Spinal canal involvement in preoperative MRI sagittal section C. Paravertebral muscle involvement in preoperative MRI axial section D,E. Postoperative 6th month MRI sagittal and axial section, no recurrence was observed F,G. Intraoperative view of cysts

**Results:** Spinal hydatid cyst accounts for only 1% of all cases of hydatid cyst. It most commonly affects the thoracic and lumbar vertebrae. It is a serious disease with significant morbidity. Primary vertebral hydatid cyst may develop with direct portovertebral venous shunts without any other systemic involvement. Comprehensive bone resection with stabilization and grafting reduces recurrence and slows the rate of progression. Historically, simple decompression with laminectomy was the most commonly used surgical procedure. Albendazole therapy is used in addition to surgery. It is recommended to wash the cyst contents and contaminated tissues with formalin, 5% silver nitrate or hypertonic saline during surgery. Washing at the operative site has been reported to reduce recurrence rates. The recurrence rate has been reported as 30-40% in spinal cystic hydatidosis despite total surgical resection. Echinococcal embryos grow multilocularly along the intratrabecular space of the vertebral bodies, causing tumor-like infiltration and damage. This is followed by pedicle and lamina invasion. Over time, it also passes through the bone cortex and spreads to the surrounding tissues. Spinal hydatid cyst cases are mostly multiple course. In our case, multiloculated involvement spreading to primary extradural paravertebral areas was observed in the lumbar region. We found that multiloculated spinal involvement is rare in the literature review.

**Conclusion:** Spinal hydatid cyst is a difficult disease to treat because of its recurrence rates. Medical treatment and radiological follow-up are required after surgery.

**Keywords:** Hydatid cyst, Spinal



## P-08

### LUMBAR DISC HERNIATION AND VERTEBRAL HEMANGIOMA CASE

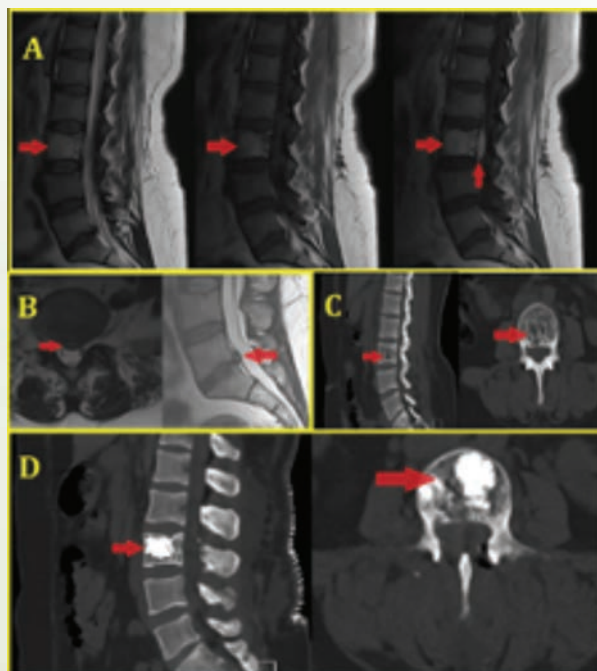
Gülsüm ARSLAN<sup>1</sup>, Muhammed Şamil SAGLAM<sup>1</sup>, Muhammed Erkam YUKSEK<sup>1</sup>, Densel ARAC<sup>1</sup>, Fatih KESKİN<sup>1</sup>

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**Aim:** Haemangiomas are congenital vascular malformations. Their classification is made up according to the predominant vascular morphology. Capillary haemangioma is the most common subtype. Haemangioma is the most common benign tumour of the spine and occurs in approximately 10%. Haemangiomas are often located intraosseous. They most commonly involve the thoracolumbar spine. They are frequently located in the intradural-extramedullary space (70%). Haemangiomas involving the central nervous system are very rare in young people.

**Method:** A 53-year-old female was admitted to our hospital with complaints of left hip and leg pain. In the examination, there was a 30% deficit in the left knee extension, 30% in the left ankle dorsiflexion, 30% in the left big toe dorsiflexion, and the laseque test was positive at 30 degrees on the left. On magnetic resonance imaging (MRI) showed haemangioma in the L3 vertebral corpus and extruded disc herniation at the L5-S1 level and dural sac compression were observed. A haemangioma in the L3 vertebral corpus was also observed on computed tomography (CT). Surgery was performed for both lumbar disc herniation and lumbar haemangioma in the same session. Vertebroplasty was performed on the L3 vertebral body with hemangioma. Hemangioma excision was performed after vertebroplasty. Thus, massive bleeding that would occur during excision was prevented. Then L5-S1 microdiscectomy was performed. The pathological examination reported hemangioma. After the operation, the patient's complaints decreased and her neurological examination improved.

Figure 1





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A. Preoperative sagittal MRI T2, T1 and Contrast-enhanced MRI hyperintense lesion (red arrow) B. MRI sections with preoperative L5-S1 hernia (red arrow) C. Hemangioma in L3 corpus in preoperative computed tomography (red arrow) D. Vertebroplasty area seen on post-operative computed tomography (red arrow)

**Results:** Haemangiomas are benign vascular lesions. In the spine; Involvement of the thoracic region (72%) is more common than the involvement of the lumbar region (22%). Haemangiomas may give the same clinical findings as any space-occupying lesion in the spine, such as radicular pain, back pain or weakness. MRI is the primary imaging for diagnosis and planning treatment. On MRI, it typically shows isointense well-defined in the posterior canal to the spinal cord in T1-WI, hyperintense in T2-WI, and it shows a characteristic “avid” homogeneous contrast enhancement in contrast shooting. Large lesions may show a mass effect on the spinal cord. The characteristic histological appearance of capillary haemangiomas are lobules of thin-walled and irregular capillary-sized vessels lined with endothelial cells, surrounded by a fibrous stroma or capsule.

**Conclusion:** Haemangiomas are the most common benign spinal tumours. MRI is the preferred imaging method for diagnosis. In the treatment, full cure is expected with surgical treatment. Massive hemorrhages during vertebral hemangioma excision can be prevented by pre-excision vertebroplasty.

**Keywords:** Haemangioma, Lomber Disc Hernia, Vertebroplasty



## P-09

### A CASE REPORT; ESOPHAGEAL PERFORATION ASSOCIATED WITH ANTERIOR CERVICAL DISCECTOMY

Salih Buğra Yılmaz<sup>1</sup>

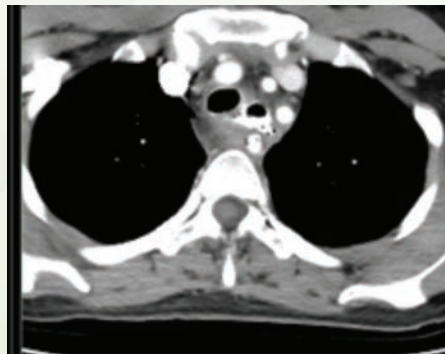
<sup>1</sup>Samsun Eğitim Ve Araştırma Hastanesi

**Aim:** Anterior cervical surgery have been associated with satisfactory outcomes. Despite the overall good outcome, in rare occasions, a complication may occur, which can be troublesome and occasionally catastrophic. Early identification and prompt management of these potential complications are imperative for accomplishing good outcome in these patients. The majority of these complications are transient and self-limited, however in very rare instances, they may require a second surgical intervention, and if they remain undetected may even lead to death. Anterior cervical discectomy has variety of postoperative complications. Dysphagia is one of the most common complication especially in the early postoperative period, whereas esophageal perforation is one of the rarest and yet most fatal complication. The incidence of esophageal perforation is estimated between 0.25 and 1.49%, and mortality rate as 19%.

**Method:** A Case Report

**Results:** Case : A 41 year old female patient, who has had neck pain for 4 months and pain in her right arm for 2 months, states that numbness and weakness in the right hand have also been present recently. The patient underwent anterior cervical diskotomy surgery. No complications were noticed during the operation. Post operative pain complaint resolved. A 2-way cervical XR was taken to the patient. No prosthesis malposition was detected. After the operation, the patient started to have pain when swallowing and continued to have difficulty in swallowing despite conservative methods, and also had subfebrile fever. The patient underwent neck thorax CT with oral and IV contrast. Esophageal rupture was diagnosed.

Oral and İV contrast CT



**Conclusion:** Today, although satisfactory results can be obtained in the early period in patients after anterior cervical discectomy operations; complications can be fatal. Early recognition and management of complications is very important. Since dysphagia is a common complication after surgery, it is difficult to diagnose esophageal rupture in cases where no esophageal damage was observed during the operation, but it is a condition that should be kept in mind.

**Keywords:** anterior cervical spine surgery, complications, dysphagia, esophageal perforation



## P-10

### A CASE: LUMBAR DISC HERNIA WITH INTRA-DURAL PLACEMENT

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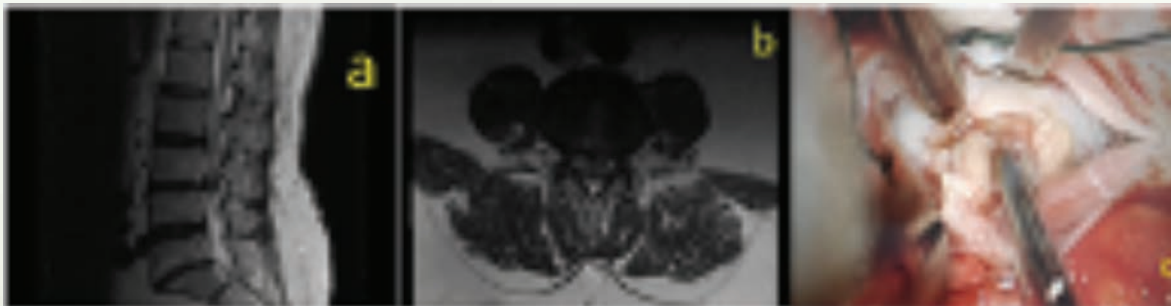
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**Aim:** Lumbar disc herniation (Ldh) herniated into the intradural space is a very rare lumbar degenerative phenomenon. It constitutes approximately 0.04-0.33% of all lumbar disc herniations (1). Its pathogenesis and natural history are still unclear. In this report, we aimed to present a case of Ldh herniated into the intradural area.

**Method:** A 64 year old male patient, applied to us with complaints of low back pain, right hip and leg pain, and loss of strength in the right ankle, which has been present for about 3 weeks and has been increasing for the last 1 week. After the first evaluation, the patient was admitted to the neurosurgery service to be operated for Ldh.

**Results:** In the pre-operative neurological examination of the patient, 80-90% loss of muscle strength was observed in the dorsal flexion of the right ankle and dorsal flexion of the right toe, and there were signs of hypoesthesia in the right L4 dermatome. Contrast-enhanced Lumbar MRI (Magnetic Resonance Imaging) revealed Ldh suggesting indentation to the intradural area at the L3-4 level, there was no contrast enhancement in the existing lesion. The patient was taken into operation. At the L3-4 level, the free disc fragment pressing on the L4 root was excised with a right approach and discectomy was performed at the L3-4 disc level with a bilateral approach; however, the dural sac was still tense. The dura mater was opened and checked, free disc fragment was seen on the anterior surface of the dura in the intradural space, it was excised with the transdural technique. The operation was completed by performing short segment fusion surgery. Partial improvement was detected in the post-op neurological examination of the patient, and as such, he was transferred to the Physical Therapy and Rehabilitation Service for rehabilitation purposes.

#### Images



a and b: Lumbar MRI image of the patient. c: Imaging of intra-dural lumbar disc herniation under intra-operative microscope (with Transdural approach)

**Conclusion:** Intradural Ldh is a difficult case to diagnose pre-operatively. The dural sac should be checked if it is suspected in pre-operative imaging, if tension is observed, the dura mater must be opened and the dural sac checked with a transdural approach.

**Keywords:** Disc herniation, Intradural, Lumbar



## P-11

### RECURRENT SPINAL HYDATID CYST IN A CHILD

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**Aim:** Hydatid disease is caused by infestation with *Echinococcus granulosus*. Lung and liver are by far the most common regions affected. Spinal hydatid disease is a rarity, even more so in children. Although the disease of primary vertebral origin is rare, it has devastating sequelae. Therefore, clinicians working in endemic areas should consider it in the differential diagnosis.

**Method:** A 9-year-old female child suffered from a 1-month history of back pain after a traumatic fall while walking. Disability in walking and progressive weakness and numbness of both lower extremities were her accompanied other symptoms. The initial clinical examination on the admission of our hospital revealed muscle strength is 3-4/5 in the lower extremity, and there is hypoesthesia starting from bilateral L1 dermatome on sensory examination. In spinal MRI, a lesion measuring 19x13x0.9 cm in the posterior part of the T12 vertebral body, hypointense in T1AG and hyperintense in STIR sequence is detected. An operation was carried out, T12 total laminectomy; T11-L1 partial total laminectomy was performed, and cyst hydatid like lesion was removed totally by preserving cyst wall integrity and taking care of unrupturing in stepwise water dissection method. Pathology report was compatible with hydatid cyst. She used albendazole for 6 months. The patient presented again with complaints of back pain and gait disturbance after 3 years of follow-up. A newly developed cystic lesion was detected in spinal MRI. He was operated on and L1 Total laminectomy and T11 laminectomy expansion were performed. Albendazole treatment was discontinued at 1 year with control imaging. In the follow-up, 2 years later, the patient's control spinal MRI showed an increase in the size of the cystic component extending to the spinal cord compared to the previous examination, and increased pressure on the canal and conus. He was operated, T10-11 and L1-2 stabilization, total excision of the left paracentral extradural lesion compatible with hydatid cyst was performed from the T12 level. He was followed up for 2 years with albendazole.

**Results:** Cabergoline and baclofen treatment was started for the muscle spasms of the patient whose lordosis became evident to compensate for postoperative kyphosis and pain. He is being followed under exercise with the physical therapy and rehabilitation department.



## P-11

### Follow-up MRI images of the patient



a) A lesion with a signal characteristic (cystic?) hypointense in T1AG and hyperintense in STIR sequence in the posterior part of the T12 vertebral body. At this level, expansion in the spinal cord and increase in intensity in T2AG T12 vertebral corpus at the lower end-plate level in the right half, hypointense in T1AG and hypohyperintense in T2AG, a lesion with trabeculae appearance (atypical hemangioma?). b) Operated thoracic vertebral hydatid cyst; Laminectomy defects at the thoracic level, non-enhancing cystic lesions in the T12 vertebra and spinal canal with the features specified (There is no difference in the areas located within the vertebral corpus, lesions located in the lateral vertebrae and in the spinal canal are newly developed and recurrent hydatid cysts are primarily considered). c) Laminectomy defects at the thoracic level. Lesions extending to the spinal canal in the T12 vertebra and posterior part (according to the previous examination, there is an increase in size of the cystic component extending to the spinal canal and increased conus compression).

**Conclusion:** Although this disease is introduced as a benign pathology according to its clinical presentation and biological behavior, its mortality and morbidity is quite high due to the management of the disease, high recurrence rate, and requiring repeated spinal surgeries.

**Keywords:** SPINAL HYDATID CYST, RECURRENT, PEDIATRIC



## P-12

### A CASE OF CERVICAL SPONDYLOMYELOPATHY ACCOMPANIED BY DYSTONIA

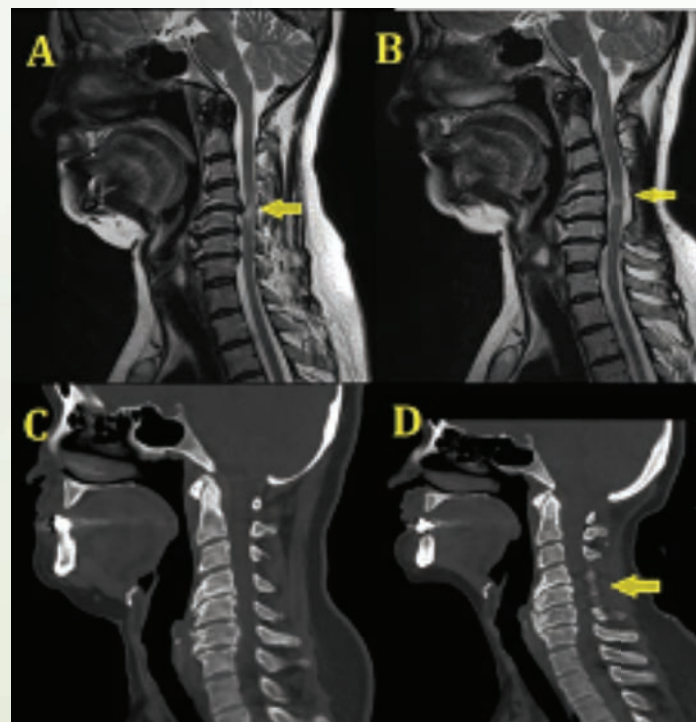
Muhammed Şamil SAGLAM<sup>1</sup>, Muhammed Erkam YUKSEK<sup>1</sup>, Büşra GUL<sup>1</sup>, Muhammet Talha YILDIRIM<sup>1</sup>, Mehmet KENAN<sup>1</sup>, Fatih KESKIN<sup>1</sup>

<sup>1</sup>Necmettin Erbakan University Meram Faculty of Medicine Department of Neurosurgery

**Aim:** Dystonia is a common movement disorder characterized by sustained or intermittent musclecontractions that lead to abnormal posture and movement. Cervical dystonia (CD) can be focal,multifocal or generalized. Chronic CD can lead to degenerative changes in the spine at a young ageand has been rarely reported. Movement disorders have been reported to cause cervical spondylosisresulting in radiculopathy, myelopathy, or both.

**Method:** A 53-year-old female patient was admitted to our hospital with the complaint of numbness on the leftside of her body for 2 months. The patient with a diagnosis of dystonia had left hemiparesis onexamination. Muscle strength was evaluated as 4+/5. Hoffman was positive on the left and deeptendon reflexes were hyperactive on the left. Cervical magnetic resonance imaging of the patientrevealed narrowing of the spinal canal at the C4-5 level and a myelomalastic change. The patient,whose neurological examination revealed upper motor neuron findings, was operated with thediagnosis of cervical spondylomyelopathy (SSMP). The patient underwent posterior cervicalstabilization with a C4-C5-C6 lateral mass screw, followed by decompression with C4-C5 totallaminectomy. The patient, who was recommended to take physical therapy exercises after theoperation, was discharged without any complications.

Figure 1





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## P-12

A. Hyperintensity-myelopathy at C4-5 level on preoperative T2 sequence sagittal MRI (yellow arrow) B. T2 sequence relieved spinal cord on postoperative sagittal MRI C. Preoperative Computed Tomography sagittal section D. The laminectomy area is seen in the postoperative Computed Tomography sagittal section (yellow arrow)

**Results:** Cervical myeloradiculopathy can be seen at a younger age in patients with movement disorders and is more common in the upper cervical spine (most often C4-5). Spondylomyelopathy presents with progressive narrowing of the spinal canal and foramen. The most common factor associated with SSMP is aging. Non-repetitive abnormal movements in CD lead to early spinal degeneration and myeloradiculopathy. Botulinum toxin is useful, but cannot be used for a long time due to the formation of antibodies overtime. Botulinum toxin should be given in case of compression due to mild stenosis. It can be used to prevent progression and facilitate stabilization for fusion after spinal surgery. Laminectomy alone in CD may lead to instability future. Therefore, fixation and fusion with DBS is the preferred surgical modality in selected cases with cord compression whose dystonia does not regress with pharmacological treatment. Perioperative stabilization is important to obtain better results, proper perfusion, and to minimize neurological sequelae.

**Conclusion:** Movement disorders cause early cervical spondylosis, usually involving the upper cervical levels. Pharmacotherapy, treatment with botulinum toxin, pallidal DBS, nerve blocks and spine surgery are the current treatment options. Laminectomy with lateral mass fixation can be used successfully in the absence of kyphotic deformity.

**Keywords:** Dystonia, Cervical Myelopathy



## P-13

### A CASE OF LUMBAR OSTEIOD OSTEOMA PRESENTING WITH LOW BACK PAIN AND SCOLIOSIS

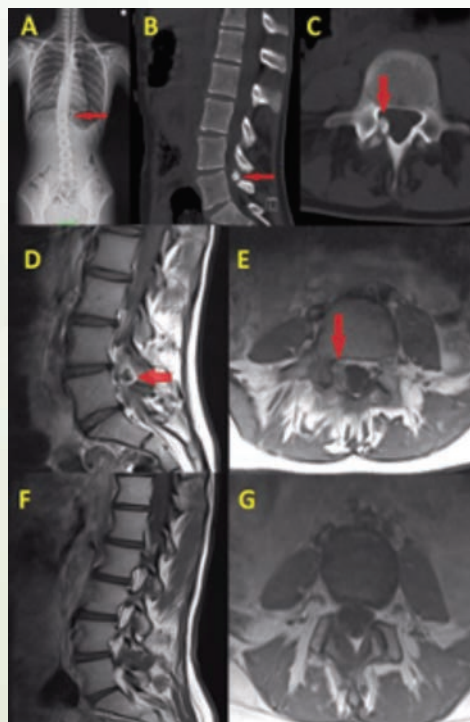
Muhammet Talha YILDIRIM<sup>1</sup>, Muhammed Erkam YUKSEK<sup>1</sup>, Büşra GUL<sup>1</sup>, Mehmet KENAN<sup>1</sup>, Fatih KESKİN<sup>1</sup>

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**Aim:** Osteoid osteoma, which is a very rare benign bone tumor, affects long bones more frequently. Spinal involvement occurs in approximately one out of every ten cases. It is reported that osteoid osteoma is detected in 11% of benign bone tumors and 5% of all bone tumors. It has not been reported to transform into malignant tumors with an aggressive course. Spinal involvement is most common in the lumbar region. It is more common in patients aged 5-25 years. The incidence of osteoid osteoma in men is than in women. Osteoid osteomas, usually have a central vascular nidus. Severe extremity pain that increases at night is dramatically reduced by non-steroidal anti-inflammatory drugs. Postural disorders may develop secondary to pain and muscle spasm.

**Method:** Neurological examination of a 17-year-old female patient who was admitted with the complaint of low back and right leg pain for 1 year was normal. Direct radiograph showed scoliosis. Computed tomography (CT) and Contrast-Enhanced Lumbar Magnetic Resonance Imaging (MRI) revealed an ossifying lesion of 15 mm in diameter with peripheral contrast enhancement in the posterior neighborhood of the L5 right pedicle. In the operation, the hard ossified mass reached under the L4 lamina was excised, and neural decompression was achieved. After the operation, the complaints of the patient were completely relieved.

Figure 1





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## P-13

A. Left-facing scoliosis (red arrow) on scoliosis radiograph B.C. Ossifying lesion (red arrow) on sagittal and axial lumbar Computed Tomography ALSO. Contrast-enhanced lesion with contrast enhancement on sagittal and axial sections of Lumbar MRI (red arrow) F,G. Adequate decompression is observed in postoperative MRI images.

**Results:** Young adolescents may exhibit scoliosis due to osteoid osteoma. Osteoid osteoma causes more proinflammatory chemicals to be secreted. Patients develop scoliosis due to pain and chronic inflammation. Extremely low risk of recurrence following complete resection. Radiofrequency ablation (RFA) is a minimally invasive technique. The RFA approach, which has a claimed 90% success rate, has become prevalent in the treatment of extradural tumors such as osteoid osteoma. The tumor must be 15 millimeters away from the nerve root for RFA to be performed safely. In this instance, the proximity of the lesion to the spinal nerve rendered the RFA operation unsafe. Consequently, an open excision was conducted under a microscope.

**Conclusion:** Osteoid osteoma should be carefully examined in the differential diagnosis if the discomfort of patients with chronic low back pain and symptoms that do not resolve with rest. Consider that radiographic studies of young adolescents with scoliosis may reveal osteoid osteoma. CT is preferred for determining the lesion's location and size. MRI has been preferred for defining its relation to soft tissues. Open excision is a useful treatment approach when minimally invasive procedures pose a risk of damaging the nerves.

**Keywords:** Spinal Osteoid Osteoma



## P-14

### TEMPLE BARAITSER AND KLINEFELTER SYNDROME WITH ACCOMPANYING SCOLIOSIS: A CASE STUDY

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<sup>1</sup>Başakşehir Çam ve Sakura Şehir Hastanesi

**Aim:** Temple Baraitser Syndrome (TBS) is a very rare genetic disease accompanied by aplasia/hypoplasia of the thumbs and feet, pseudomyopathic appearance, hypotonia in infancy, severe developmental delay and epilepsy. This disease is caused by a mutation in the KCNH1 gene, which encodes voltage-gated potassium channels in the central nervous system. Scoliosis was very rarely reported in TBS. In addition to the limited literature, a TBS case operated for scoliosis has not been reported before. In this case report, it was aimed to present our experience regarding the accompanying progressive scoliosis deformity and its surgical treatment in a patient with a confirmed diagnosis of TBS and Klinefelter Syndrome.

**Method:** A 14-year-old male patient diagnosed with TBS and Klinefelter Syndrome was scheduled for surgery due to progressive scoliosis deformity. He had been using antiepileptic drugs since he was 4 years old because of his epilepsy. The scoliosis deformity, which initially started as mild at the age of 9, had increased significantly. Whole spinal magnetic resonance imaging (MRI) examinations were performed to differentiate intraspinal pathologies and biplanar scoliosis radiographs before surgery. Posterior instrumentation and fusion were planned for scoliosis correction.

**Results:** The case had pilepsia, severe developmental delay, fine motor developmental delay, sensory sensitivity, thumb nail hypoplasia, and gingival fibromatosis. Family history could not be determined. With assistance, he was able to walk and stand for short periods. Radiographically, reverse thoracic 72° (T6-T12), lumbar 55° (T12-L4) scoliosis, and L5 vertebral sacralization were detected (Figure 1). No intraspinal pathology was observed in MRI. In scoliosis surgery, facet osteotomies between T3-L3 vertebrae were performed by placing pedicle screws at each level and correcting and fusion with rods with appropriate contours. The operation lasted 4 hours, no blood transfusion was needed. Postoperative curvature regressed to 18°. He stood up on the 1st postoperative day and was discharged on the 7th day without any problem. No complications were encountered in the early period.

Figure 1





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## P-14

A 14-year-old male patient diagnosed with Temple Baraitser Syndrome and Klinefelter Syndrome was scheduled for surgery due to progressive scoliosis deformity. The case had pilepsia, severe developmental delay, fine motor developmental delay, sensory sensitivity, thumb nail hypoplasia, and gingival fibromatosis. Family history could not be determined. With assistance, it was possible to walk and stand for short distances. Radiographically, reverse thoracic 72° (T6-T12), lumbar 55° (T12-L4) scoliosis, and L5 vertebral sacralization were detected.

**Conclusion:** As in our case, progressive scoliosis curvature due to TBS and Klinefelter Syndrome, which is very rare, may need to be corrected. In patients who need surgical treatment of scoliosis, a careful decision should be made by considering the size of the curvature, its progressive nature, and its effects on quality of life. Since there is no similar case previously reported in the literature, it is necessary to evaluate the long-term effects and functional results of surgery with close follow-up.

**Keywords:** Temple Baraitser Syndrome, KCNH1 gene, Klinefelter Syndrome, scoliosis



## P-15

### SOMETIMES IT IS JUST BRUCELLA

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**Aim:** Spinal involvement is the most common musculoskeletal manifestation of brucellosis, which is very common in adults more than 50 years of age in endemic regions. Brucellosis of the spine is rare among children. Few studies on pediatric spinal brucellosis have been published. It also aims to create awareness among all health care professionals, especially spine surgeons.

**Method:** Case 1: A 15-year-old male patient living in Van, Türkiye applied to our clinic with complaints of low back and hip pain and inability to walk for 1 month. He had a history of falling from height 3 months ago. He had constitutional symptoms such as loss of appetite, weight loss, and fever. On physical examination, there was painful lumbar range of motion. There were significant paravertebral muscle spasms at the bilateral lower lumbar level and significant scoliosis. Spinal MRI was performed, and an appearance compatible with spondylodiscitis was detected (Figure 1). Consumption of raw or unpasteurized animal milk, a history of contact with infected animals or animal products, and a family history of brucellosis were present in the patient. Coombs Brucella agglutination test was positive at 1/2560 titer. All clinical and radiological findings regressed with gentamicin for 2 weeks, doxycycline and rifampicin for 6 months.

**Results:** Case 2: A 15-year-old male patient living in Van, Türkiye is admitted with back pain for 5 days and limping in his left leg. He was limited by pain upon ambulation and reported intermittent fevers without bladder/bowel incontinence or upper extremity symptoms. Overall, he was grossly neurologically intact. Spinal MRI revealed an appearance compatible with spondylodiscitis and a small epidural abscess (Figure 2). There was a history of consumption of raw or unpasteurized animal milk and contact with infected animals or animal products. She had not previously received treatment for brucellosis. Brucella spp. grew in blood culture. Coombs Brucella agglutination test was positive at 1/5120 titer. Surgical drainage was not performed. All clinical and radiological findings regressed with gentamicin for 2 weeks, doxycycline and rifampicin for 6 months.



P-15

Figure 1 and 2.



Figure 1. T2 hyperintense (a) and T1 hypointense (b) signals and contrast enhancement (c) are seen involving the L3, L4, L5, and S1 vertebral bodies and intervertebral disks. Breaches of the anterior halves of superior end plates with a fluid signal intensity are seen. There is a slight extension of inflammation into the epidural space (white arrow). The rest of the intervertebral discs and lumbar vertebrae are normal. Findings are consistent with spondylodiscitis. The last contrast enhanced T1W image (d) was obtained two months after the initiation of treatment; contrast enhancement was decreased. Figure 2. T2 hyperintense (a), T1 hypointense (b) signals, and contrast enhancement (c) are seen involving the L4 and L5 vertebral bodies and L4-5 intervertebral disk. A breach of the posterior half of the superior end plate with a fluid signal intensity and peripheral contrast enhancement is seen. There is also a small epidural abscess (white arrow). Findings are consistent with spondylodiscitis. The last T2W image (d) was obtained two months after the initiation of treatment; there was no contrast enhancement (not shown) while slight T2 hyperintensity persisted.

**Conclusion:** Nonspecific back pain is the main presenting symptom of spondylodiscitis, but its lack of specificity often leads to delays in diagnosis and treatment, which can prove to be permanently disabling or even fatal as the management of brucellar spondylodiscitis is time-sensitive. Health care professionals should have high suspicion for brucellosis in children presenting with back pain with or without neurological deficits, with or without constitutional symptoms, especially in endemic region.

**Keywords:** spondylodiscitis, Brucella, pediatric



## P-16

### A CASE OF UNIFOCAL LANGERHANS CELL HISTIOCYTOSIS INVOLVING THE THORACIC VERTEBRA

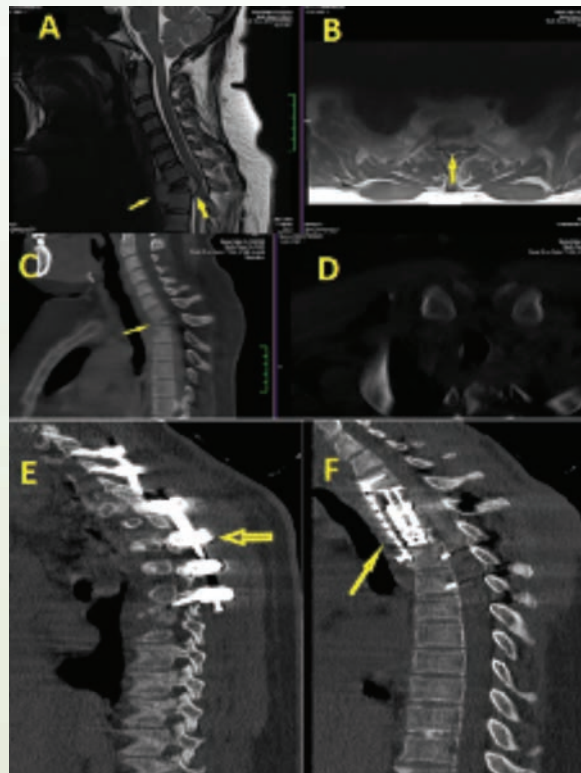
Gülsüm ARSLAN<sup>1</sup>, Muhammed Şamil SAGLAM<sup>1</sup>, Muhammed Erkam YUKSEK<sup>1</sup>, Büşra GUL<sup>1</sup>, Mehmet KENAN<sup>1</sup>, Mehmet Fatih ERDİ<sup>1</sup>, Fatih KESKİN<sup>1</sup>

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**Aim:** Langerhans cell histiocytosis (LCH) is a rare disease in which the bone marrow produces uncontrolled dendritic cells that affect all organs. In most cases, the bones are affected. This article presents a case of LCH with unifocal involvement of the thoracic spine.

**Method:** Neurological examination of a 36-year-old female patient who presented with back pain and an inability to walk for three weeks revealed paraparesis; left lower extremity muscle strength was 2/5, and right lower extremity muscle strength was 3/5. Radiological examination of the patient with hypoesthesia at T10 and bilateral Babinski positivity revealed a T1 vertebral fracture and a mass causing bone expansion. In the first session, the patient underwent anterior total C7 and T1 and partial T2 corpectomy with sternotomy, and a plate cage was inserted. One week after the patient was immobile, posterior stabilization with a domino was performed in a second session. LCH was detected on pathologic examination. Routine follow-up examinations after surgery revealed that the patient's neurological examination improved and her symptoms disappeared.

Figure 1





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## P-16

A. Mass causing spinal cord compression in preoperative sagittal T2 MRI (yellow arrow) B. A mass causing cord compression in the axial section of the preoperative MRI (Yellow arrow) CD. Bone involvement in preoperative computed tomography (yellow arrow) E,F. Instruments applied from anterior and posterior in postoperative sagittal computed tomography images

**Results:** The annual prevalence of LCH cases, whose etiology and pathogenesis are still unknown, is extremely rare in adults. Patients often present with focal pain. In 75-80% of LCH patients, only the bones are affected. Organs that may be affected include the liver, spleen, and bone marrow. The disease is divided into three subcategories: LCH involving one system, LCH involving the lungs, and LCH involving multiple systems, with or without involvement of organs at risk. The prognosis of the disease varies depending on the organ involved. The mildest clinical manifestation is observed with unifocal bone involvement. The skull and thorax are most commonly involved. Spinal involvement is less common. The final diagnosis is made by biopsy. Conservative treatment, intralesional steroid injections, radiotherapy, and chemotherapy are the treatment modalities for spinal LCH. Computed tomography is used to assess the extent of bone destruction and to assist biopsy. Magnetic resonance imaging evaluates soft tissue pressure on nerves and nerve invasion. Positron emission tomography is used to distinguish metabolically active, inactive, or healed disease. The appearance of a “vertebra plana” with collapse of the vertebral body may occur.

**Conclusion:** LCH can affect any organ of the body. Because bone localization may be the only symptom of the disease, misdiagnosis may occur and treatment may be delayed. Decompressive surgery is indicated for patients with spinal cord compression. Further studies are needed to develop a cause-specific LCH treatment.

**Keywords:** Spinal Langerhans Cell Histiocytosis



## P-17

### FACTORS CAUSING COMPLICATIONS AND DISABILITY IN PATIENTS OPERATED FOR SPINAL STENOSIS

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<sup>2</sup>Özel Klinik

**Aim:** Spinal stenosis can be seen in elderly patients after aging of the spine and unsuccessful disc surgeries in young people. Today, the proportion of patients with spinal stenosis is increasing with both the aging of the society and the increase in the number of disc surgeries. Parallel to this increase, more complications are observed. The aim of this study is to determine the causes of complications in patients who underwent posterior spinal instrumentation for spinal stenosis.

**Method:** Patients who underwent instrumentation for spinal stenosis by two orthopedic surgeons were evaluated retrospectively. Patients who could be followed up for at least 12 months were included in the study. Preoperative indications were determined as (acute-subacute cauda equina, neurological weakness, shortening of walking distance (claudication), inability to walk despite minimal neurological loss (wheelchair). Previous disc surgery and instability were determined. Number of segments in which the instrument was placed during the operation and interbody fusion (cage) ). Statistical evaluation was made with SPSS-20.  $P < 0.05$  was accepted as statistical significance level.

**Results:** 64 patients with clinical follow-up were included in the study. The mean age of the patients was 62 (34-81). There were 51 (79.7%) female and 13 (20.3%) male patients. mean follow-up times were 48.56 (12-134) months. Mean VAS scores were 3.22 (1-9). The mean Oswestry scores were 11.31 (2-45). Complications were seen in a total of 13 (20.3%) patients. There was a significant difference between preoperative mobilization status and infection ( $p:0.034$ , Pearson Chi-square test). There was no statistically significant difference between gender, disc surgery, cage use, instability rates and complication rates ( $p > 0.050$ , Chi-square test). According to the sperm correlation test, a significant correlation was found between age and Oswestry and the number stabilization levels ( $p:0.023$  and  $<0.001$ ). Naturally, VAS scores and Oswestry scores were also correlated with each other ( $p < 0.001$ ). The Oswestry score was found to be lower in female patients ( $p:0.044$ , Mann Whitney U). Oswestry scores of the patients with Cage were lower ( $p:0.07$ ). Oswestry and VAS scores were significantly worse in patients with instability ( $p:0.05$  and  $0.015$ ). Again, the clinical scores of the patients who developed complications (Oswestry and VAS) were worse than those who did not ( $p < 0.001$  and  $0.002$ ).



P-17

figure



Relapse and development of cauda equina due to severe spinal stenosis in a patient who had previous lumbar disc surgery.

table

		Oswestry	s.d.	p value	VAS score	s.d.	p value
Gender	Female	12.41	11.204	0.044	3.39	2.201	0.181
	Male	7.00	7.348		2.54	1.664	
Instability	Yes	9.04	11.161	0.050	2.58	2.125	0.015
	No	12.68	10.334		3.60	2.048	
Cage usage	Yes	7.88	8.555	0.007	2.60	1.756	0.053
	No	13.51	11.457		3.62	2.255	
Previous lumbar disc surgery	Yes	11.53	9.680	0.534	3.47	1.995	0.409
	No	11.24	11.101		3.14	2.170	
Complication	Yes	23.77	14.538	<0.001	5.54	2.989	0.002
	No	8.14	6.573		2.63	1.326	

pain and disability scores.

**Conclusion:** According to the evaluation, the patient's being immobile for a long time before the operation (wheelchair) increases the infection rate. Female patients, Cage users and patients with instability have more pain and disability.

**Keywords:** spinal stenosis, complications of spine surgery, posterior spinal instrumentation



## P-18

### ABNORMAL ROUTE OF RECURRENT LARYNGEAL NERVE IN A LEFT SIDED C6 CORPECTOMY

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<sup>1</sup>Istanbul Kanuni Eğitim ve Araştırma Hastanesi Ortopedi ve Travmatoloji

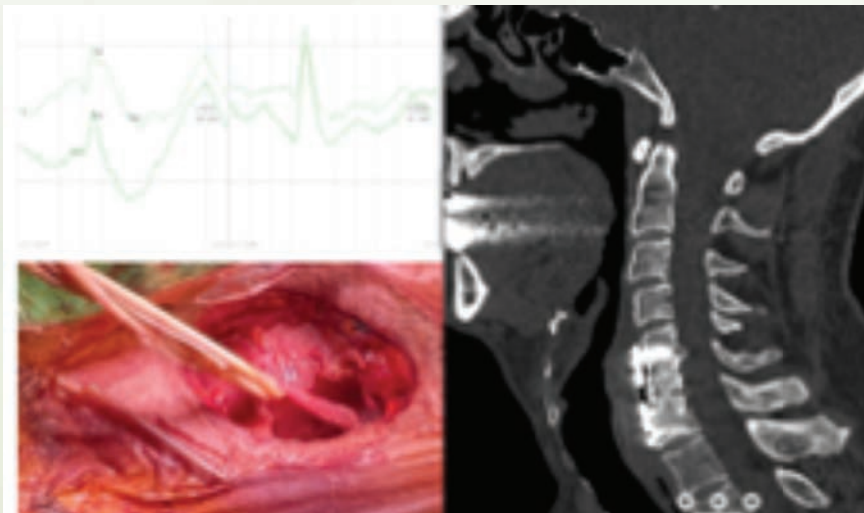
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**Aim:** One of the various complications seen after the anterior cervical disc surgery is recurrent laryngeal nerve (RLN) injury. According to literature, avoiding this complication is possible by choosing the approach side as left due to well known route of RLN. During anterior cervical discectomy and fusion procedure, for improved visualization opposite side approach is used. For patients with left sided symptoms surgeons are prone to choose a right sided exposure with awareness of RLN. Here we present a case with abnormal route of RLN at left side and it's management.

**Method:** A 62 yo male patient admitted to outpatient service with neck and upper extremity pain. Minimal muscle weakness recorded for triceps and shoulder girdle muscle. Patient's CT scans and MRI revealed left sided severe foraminal stenosis for C6 and C7 roots. C6 and C7 root deficiencies recorded at EMG.

**Results:** Patient's written informed consent obtained for the surgery. Patients's symptoms were at the left side but we planned corpectomy so we decided to perform a left sided Smith-Robinson approach for safety of RLN. After patient positioning and draping we use the left sided approach and RLN observed lying down in front of the prevertebral fascia. The nerve was dissected from the fascia and mobilized to the medial side of approach. Neuromonitorization didn't give abnormal signals from RLN before and after dissecting the nerve and during all surgical period. A C6 corpectomy was performed and a titanium mesh cage filled with iliac autograft was placed to the corpectomy space and locking cervical plate was used for fixation. At the end of the surgery MEP improved for left C6 and C7 roots.

Nim,corpectomy,RLN





# XV. Uluslararası Türk Omurga Kongresi “Omurgada Deformite”

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Wyndham Grand Izmir



P-18

**Conclusion:** Even if the common idea is using left side for anterior Smith-Robinson approach is safer, we can see the left recurrent laryngeal nerve with many branches and a long trace. Dissection of RLN preferably under neuromonitorization provide excellent visualization of prevertebral fascia without nerve damage

**Keywords:** cervical corpectomy, cervical radiculopathy, recurrent laryngeal nerve, neuromonitorization



## P-19

### KOÇ TRIANGLE FIXATION FOR U-TYPE SACRAL FRACTURE: A TECHNICAL NOTE

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**Aim:** Isolated U or H-type fractures are 2 to 5% of the sacral fractures which usually occurs due to falling from a height. We report an U-type sacral fracture that occurred in a motor vehicle crash that was treated with a novel technique of triangular fixation. The aim of this study was to describe a novel method for fixation of an U-type sacral fracture without the need for lumbopelvic system and fusion.

**Method:** A 59 years old female multitrauma patient with an Roy-Camille Type 2, U-type sacral fracture with accompanying multiple fractures of the metacarpals and metatarsals as well as distal femur and radius fractures was scheduled for surgical treatment of the distal femur and sacral fractures as the first step of the treatment. She had no neurological deficit.

**Results:** Surgery started in supine position for the distal femur fracture and position was then changed to prone for sacral fixation. In prone position under general anesthesia, midline incision was made between S1 and S3 level vertebrae. Subperiosteal dissection was carried out to visualize the posterior facet. Fixation was performed under fluoroscopy. Pedicle screws were applied bilaterally for the S1 fixation. Then screws from S3 to iliac were applied bilaterally. Titanium rods were put in place bilaterally to reduce the sacral fracture. Additional S2 to iliac screws were applied to strengthen the fixation. Rods were used to complete the fixation system. Screws were tightened to achieve final fixation. The patient was able to sit down without loss of fixation starting from the postoperative first day. Written patient consent was obtained from the patient for this report.

**Conclusion:** This novel method can be used for U-type sacral fractures without the need for lumbopelvic system and fusion; however further studies are needed to show the effectiveness of this fixation system.

Final fixation

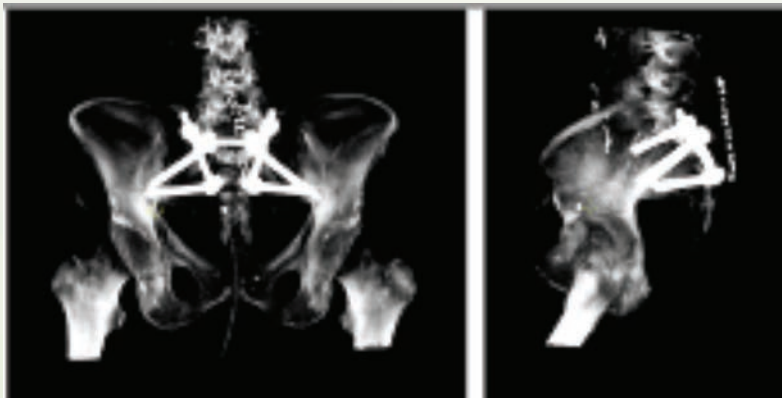


Image of final fixation system.

**Keywords:** Sacral fracture, Triangular fixation

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