7TH ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023
WORKSHOPS
November 17, 2023
CONFERENCE
November 18-19, 2023
PROGRAM BOOK
WELCOME MESSAGE

The Saudi Spine Society would like to welcome you all to the 7th Annual conference, which will be hosted in Riyadh, November 17th - 19th 2023. This year, we will build up on the previous success and maintain our organization of having the 1st day as the preconference workshops day, followed by two days of multi disciplinary spine health care related sessions, targeting the sole strength of our society, the diverse specialties treating the spine from both surgical and nonsurgical aspects. There will be a large exhibition hall with all the latest spine related medical companies displaying their materials.

We are looking forward to having our local spine expert speakers, along with distinguished regional and international guests discussing the latest technologies, updates and pears of spine care, several local and international guest societies will collaborate to cover the most pressing matters related to spine health and care.

In addition, Visiting Riyadh during November would give you a unique opportunity to enjoy all the historic sightseeing, unforgettable trip to the beautiful desert and visiting the iconic Riyadh season events in the most pleasant weather and atmosphere.

Hope to see you all in this coming November.

Dr. Faisal Konbaz
President, 7th Saudi Spine Society Annual Conference

Dr. Abdulkarim Alrabie
Chairman, Scientific committee
SCIENTIFIC COMMITTEE
7th ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023

CLINICAL NEURODYNAMICS FOR NEUROMUSCULOSKELETAL SYSTEM CERVICAL SPINE

CHAIR:
DR. ALI M. ALSHAMI

FRIDAY, NOV 17, 2023
RIYADH, SAUDI ARABIA

COLLABORATING SOCIETIES
7th ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023

ESSENTIALS OF WRITING MEDICAL RESEARCH PAPERS

CHAIR:
DR. SULIMAN ALGHNAM

FRIDAY,
NOV 17, 2023
RIYADH,
SAUDI ARABIA

COLLABORATING SOCIETIES

admin@saudispine.org
www.saudispine.org
7TH ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023

INNOVATIVE TECHNIQUES AND TECHNOLOGIES IN SPINE SURGERY

COURSE CHAIRMEN
DR. ALI BAAJ, DR. NAYEF BIN DAJIM

FRIDAY, NOV 17, 2023
RIYADH, SAUDI ARABIA

COLLABORATING SOCIETIES

admin@saudispine.org
www.saudispine.org
7TH ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023

INTRAOPERATIVE NEUROPHYSIOLOGICAL MONITORING (IONM) FOR SPINE SURGERIES

CHAIR:
- FAISAL R. JAHANGIRI, MD

FACULTY:
- LOAY ABUKWEDAR
- ABDULLAH AL BISHI
- SYED SHAHID HABIB

FRIDAY, NOV 17, 2023
RIYADH, SAUDI ARABIA

COLLABORATING SOCIETIES

admin@saudispine.org
www.saudispine.org
7th ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023

NEUROLIFE
CERVICAL SPINE TRAUMA

CHAIR:
PROF. AMRO AL-HABIB

FRIDAY, NOV 17, 2023
RIYADH, SAUDI ARABIA

COLLABORATING SOCIETIES

admin@saudispine.org
www.saudispine.org
ULTRASOUND GUIDED INTERVENTIONS AS A TREATMENT FOR COMMON SPINE PROBLEMS

COURSE CHAIRMEN
DR. AHMED MAHER ABDALLA

FRIDAY, NOV 17, 2023
RIYADH, SAUDI ARABIA

COLLABORATING SOCIETIES
7TH ANNUAL CONFERENCE OF SAUDI SPINE SOCIETY
RIYADH 17-19 NOV 2023

SPINE SURGICAL APPROACHES REVIEW WORKSHOP

CHAIRMAN
DR. KHALED FARES ALALI

FRIDAY, NOV 17, 2023
RIYADH, SAUDI ARABIA

COLLABORATING SOCIETIES
SCIENTIFIC PROGRAM
### DAY 1

**SESSION** | **SAUDI LOW BACK PAIN GUIDELINES**
---|---
**MODERATORS** | HANA ALSOBAYEL, ABDULWAHED BARNAWI, OMAR ALYAMANI

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 - 08:10</td>
<td>Introducing the guideline's leadership team and the guideline's key themes and message</td>
<td>Mai Aldera</td>
</tr>
<tr>
<td>08:10 - 08:25</td>
<td>The guideline process and methodology used to develop the Saudi guideline for patients with LBP</td>
<td>Klara Brunnhuber</td>
</tr>
<tr>
<td>08:25 - 08:35</td>
<td>The result</td>
<td>Hanan Alrayes</td>
</tr>
<tr>
<td>08:35 - 08:50</td>
<td>Recommendations and local considerations</td>
<td>Ahmed Al Turkistany</td>
</tr>
<tr>
<td>08:50 - 09:15</td>
<td>DISCUSSION</td>
<td></td>
</tr>
</tbody>
</table>

**SESSION** | **COMPLEX SPINE DEFORMITY**
---|---
**MODERATORS** | FAHAD ALHELAL, NAYEF BIN DAJIM, IBRAHIM ASSIRI

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:25 - 09:50</td>
<td>Adult spinal deformity surgery in older patients: indications, managements</td>
<td>Khaled kebaish</td>
</tr>
<tr>
<td>09:50 - 10:05</td>
<td>Domino connector for PSO and VCR reduction</td>
<td>Anouar Bourghli</td>
</tr>
<tr>
<td>10:05 - 10:25</td>
<td>Deformity surgery revision, how to plan it?</td>
<td>Sami Aleissa</td>
</tr>
<tr>
<td>10:25 - 10:40</td>
<td>High grade Spondylolisthesis, sagittal alignment analysis and treatment guidance</td>
<td>Waleed Awwad</td>
</tr>
<tr>
<td>10:40 - 10:50</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>10:50 - 11:20</td>
<td>Coffee Break</td>
<td></td>
</tr>
</tbody>
</table>
### DAY 1

#### SESSION KEYNOTE SPEAKER

**MODERATORS**
SAMI ALEISSA, FAISAL KONBAZ, ABDULKARIM ALRABIE

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:20 - 11:50</td>
<td>Two Decades of Adult Deformity Surgery, Contributions &amp; Lessons Taught</td>
<td>Khaled Kebaish</td>
</tr>
<tr>
<td>11:50 - 12:00</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>12:00 - 12:20</td>
<td>Opening Ceremony</td>
<td></td>
</tr>
<tr>
<td>12:20 - 13:20</td>
<td>PRAYER &amp; LUNCH BREAK</td>
<td></td>
</tr>
</tbody>
</table>

#### SESSION ABSTRACT

**MODERATORS**
ABDULAZIZ BIN SHEBREEN, SHAKER ALSHEHRI, ABDULLAH MOHABBAT

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:27 - 13:34</td>
<td>The Epidemiology, Clinical Presentation, And Treatment Outcomes In Spinal Subdural Abscess: A Systematic Review</td>
<td>Ebtesam Abdulla</td>
</tr>
<tr>
<td>13:55 - 14:02</td>
<td>Mis Tubular Discectomy Vs Conventional Vs Endoscopic for Treating Lumbar Disk Herniation : Is any of them a better option for</td>
<td>Khalid Almadni</td>
</tr>
<tr>
<td>14:02 - 14:09</td>
<td>Functional Evaluation of Patients with Lumber Disc Prolapse after Endoscopic Discectomy</td>
<td>Mohammed Elzain</td>
</tr>
<tr>
<td>14:09 - 14:20</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>TIME</td>
<td>TOPIC</td>
<td>SPEAKER</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>13:41</td>
<td>Exoscope as a valid alternative of the Operating Microscope in Cervical Spine Surgery: A Systematic Review and Meta-Analysis</td>
<td>Elsayed Mohamed Hammad</td>
</tr>
<tr>
<td>13:55</td>
<td>The accuracy of Artificial Intelligence as Clinical Decision Support System In Diagnosing Cervical Radiculopathy due to Disc Herniation and Spondylosis</td>
<td>Almaha Alzahrani</td>
</tr>
<tr>
<td>14:02</td>
<td>Anterior Discectomy and Fusion Versus Posterior Foraminotomy In Treatment of Cervical Radiculopathy: A Comparative Prospective Study</td>
<td>Ali Abdelaleem</td>
</tr>
<tr>
<td>14:09</td>
<td>DISCUSSION</td>
<td></td>
</tr>
</tbody>
</table>
## DAY 1

### HALL 1 | 18th November 2023

#### SESSION

**SPTA / ADVANCEMENTS AND CHALLENGES IN SPINE REHABILITATION: PERSPECTIVES FROM EXPERTS**

#### MODERATORS

MAI ALDERA, ABDULLAH ALMUHAYA, LOLWAH AL RASHED

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:20 - 14:32</td>
<td>Psychosocial Aspects of Spine Conditions</td>
<td>Faris A. Alodaibi</td>
</tr>
<tr>
<td>14:56 - 15:08</td>
<td>Moving towards Value based spine care</td>
<td>Othman Y. Alkassabi</td>
</tr>
</tbody>
</table>

15:08 - 15:20  **DISCUSSION**

15:20 - 15:40  **Coffee Break**

### HALL 2 | 18th November 2023

#### SESSION

**ESA: SPINE ONCOLOGY**

#### MODERATORS

KHALED ALMUSREA, MAHDI BASSI, SALEH BAEESA

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:20 - 14:32</td>
<td>When &amp; how to perform preoperative embolization in spine tumors</td>
<td>Bader Alahaideb</td>
</tr>
<tr>
<td>14:32 - 14:44</td>
<td>The indication of En Bloc resection in metastatic spine disease</td>
<td>Abdulwahed Barnawi</td>
</tr>
<tr>
<td>14:44 - 14:56</td>
<td>MIS management of metastatic spine disease</td>
<td>Osama Alrehaili</td>
</tr>
</tbody>
</table>

15:08 - 15:20  **DISCUSSION**

15:20 - 15:40  **Coffee Break**
<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:40 - 16:00</td>
<td>How to get the best clinical &amp; legal outcome in Cauda equina syndrome</td>
<td>Klaus Schnake</td>
</tr>
<tr>
<td>16:00 - 16:15</td>
<td>Post operative epidural hematoma, shall I evacuate?</td>
<td>Sultan Aldebeyan</td>
</tr>
<tr>
<td>16:15 - 16:30</td>
<td>Spinal Abscess with sepsis &amp; neurological deficit, how to act?</td>
<td>Nayef Bin Dajim</td>
</tr>
<tr>
<td>16:30 - 16:40</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>16:40 - 17:20</td>
<td>General Assembly</td>
<td></td>
</tr>
<tr>
<td>TIME</td>
<td>TOPIC</td>
<td>SPEAKER</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>07:30 - 07:42</td>
<td>Optimizing osteoporotic patients for elective spine surgery</td>
<td>Mir Sadat Ali</td>
</tr>
<tr>
<td>07:42 - 07:54</td>
<td>Techniques to improve pedicle screws fixation in osteoporosis</td>
<td>Fahad Abduljabbar</td>
</tr>
<tr>
<td>07:54 - 08:06</td>
<td>Prevention of osteoporosis</td>
<td>Anwar Aljammah</td>
</tr>
<tr>
<td>08:06 - 08:18</td>
<td>Vertebral Augmentation in Osteoporotic Spine Fractures: A Review of the Evidence</td>
<td>Rakan Bokhari</td>
</tr>
<tr>
<td>08:18 - 08:30</td>
<td>DISCUSSION</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:40 - 09:00</td>
<td>Interfacing the brain with a computer for spinal cord injury (and everything else)</td>
<td>Adam Sachs</td>
</tr>
<tr>
<td>09:00 - 09:10</td>
<td>Pain management in Spinal cord injury</td>
<td>Ghasan Hakeem</td>
</tr>
<tr>
<td>09:10 - 09:30</td>
<td>Neurological deficit in thoracic OPLL, is in an inevitable outcome</td>
<td>Adnan Alkandari</td>
</tr>
<tr>
<td>09:30 - 09:40</td>
<td>Rehabilitation for spinal cord injury</td>
<td>Naif Alradadi</td>
</tr>
<tr>
<td>09:40 - 09:50</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>09:50 - 10:20</td>
<td>Coffee Break</td>
<td></td>
</tr>
</tbody>
</table>
### DAY 2

#### EUROSPINE: ANTERIOR LUMBAR SURGERY

**Moderators:** Yahya Al Qahtani, Abdulrahman Alarjani, Shadi Shihata

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:20 - 10:35</td>
<td>Principles of Spine balance and surgical correction of spine imbalance by ALIF alone vs combined ALIF with posterior osteotomies.</td>
<td>Abdulaziz Binshebreen</td>
</tr>
<tr>
<td>10:35 - 10:50</td>
<td>ALIF (supine and lateral): advantages, limitations with presentation of deformity cases.</td>
<td>Dominique Rothenfluh</td>
</tr>
<tr>
<td>10:50 - 11:05</td>
<td>Lumbar Anterior Column Reconstruction with Anterior to Psoas approaches. Achievements and pitfalls over the last 10 years.</td>
<td>Marco Teli</td>
</tr>
<tr>
<td>11:05 - 11:20</td>
<td>XLIF, the Saudi Arabian experience</td>
<td>Anwar Alrabiah</td>
</tr>
<tr>
<td>11:20 - 11:30</td>
<td>DISCUSSION</td>
<td></td>
</tr>
</tbody>
</table>

#### COMPLEX CERVICAL SPINE TRAUMA

**Moderators:** Osama Alrehaili, Mohammed Khashab

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:20 - 10:35</td>
<td>Traumatic C1 - C2 Rotatory Subluxation: Delayed presentation and Management</td>
<td>Jehad Ahmed</td>
</tr>
<tr>
<td>10:35 - 10:50</td>
<td>Subaxial Cervical Vertebral body fractures</td>
<td>Abdulhadi Algahtani</td>
</tr>
<tr>
<td>10:50 - 11:05</td>
<td>Delayed Sub-axial cervical facet dislocation: update on management</td>
<td>Fawaz Almotairi</td>
</tr>
<tr>
<td>11:05 - 11:20</td>
<td>Central Cord Syndrome</td>
<td>Saud Alhamad</td>
</tr>
<tr>
<td>11:20 - 11:30</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>TIME</td>
<td>TOPIC</td>
<td>SPEAKER</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>11:30 - 11:36</td>
<td>An Assessment of the Longitudinal Construct Validity of the Pain Behavioural Scale (Pabs) In a Saudi Population with Chronic Low Back Pain: A Preliminary Study</td>
<td>Dalia Alimam</td>
</tr>
<tr>
<td>11:36 - 11:42</td>
<td>Number of Levels fused: An Indicator of Hardware failure following Minimally Invasive Antepsoas Fusion</td>
<td>Rehan Khan</td>
</tr>
<tr>
<td>11:42 - 11:48</td>
<td>Experience with Unilateral Dual Portal Endoscopic Tiff using Expandable Cages: Initial case series</td>
<td>Alhareth Maaya</td>
</tr>
<tr>
<td>11:48 - 11:54</td>
<td>Hardware-Related complications in patients with Transitional Lumbosacral Anatomy following Minimally Invasive Antepsoas Surgery (Mis-Atp)</td>
<td>Nader El Hajj</td>
</tr>
<tr>
<td>11:54 - 12:00</td>
<td>Successful outcome of treating Spinal ABC with Denosumab in a Pediatric Patient: A case report and Literature Review</td>
<td>Mohammed AlRushud</td>
</tr>
<tr>
<td>12:00 - 12:10</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>12:10 - 13:00</td>
<td>PRAYER &amp; LUNCH BREAK</td>
<td></td>
</tr>
</tbody>
</table>
## DAY 2

### SESSION ABSTRACT SESSION

**MODERATORS**
MUATH ABUALFARAJ, MAMDOUH AL HAWSAWI

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:36 - 11:42</td>
<td>Virtual Scoliosis-specific Exercises (Seas) with home-based application of Kinesio Taping versus Clinical-based routine Physiotherapy for adolescents with moderate adolescent Idiopathic Scoliosis</td>
<td>Ameer Almubarak</td>
</tr>
<tr>
<td>11:48 - 11:54</td>
<td>Effects of short term space travel on Spinal Health: Insights from an MRI study on Astronauts</td>
<td>Rakan Bokhari</td>
</tr>
<tr>
<td>11:54 - 12:00</td>
<td>Shoulder level changes after Minimally Invasive Anterior to Psoas (Atp) fusion in Adult Scoliosis patients</td>
<td>Henry Hojoon Seo</td>
</tr>
</tbody>
</table>

12:00 - 12:10 DISCUSSION

12:10 - 13:00 PRAYER & LUNCH BREAK

### SESSION PEDIATRIC SPINE

**MODERATORS**
ABDULMONEM ALSIDDIKY, YASSER ALBREIKEET, MOHAMED WASEF ALSEBAEI

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00 - 13:10</td>
<td>Congenital scoliosis, when to operate ?</td>
<td>Sultan Alsalmi</td>
</tr>
<tr>
<td>13:25 - 13:37</td>
<td>Role of the traction in the management of the growing spine</td>
<td>Samir Al Sayegh</td>
</tr>
</tbody>
</table>

13:50 - 14:00 DISCUSSION
<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00 - 13:10</td>
<td>Evolution of endoscopic spine surgery</td>
<td>Dhawi Al otaibi</td>
</tr>
<tr>
<td>13:10 - 13:20</td>
<td>Obstacles in Endoscopic Discectomy</td>
<td>Mohamed M Malabari</td>
</tr>
<tr>
<td>13:20 - 13:50</td>
<td>Biportal endoscopic approaches. from cervical to lumbar, from decompression to Fusion</td>
<td>Dong Hwa Heo</td>
</tr>
<tr>
<td>13:50 - 14:00</td>
<td>DISCUSSION</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME</th>
<th>TOPIC</th>
<th>SPEAKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:10 - 14:30</td>
<td>Dysphagia and aspiration following multilevel ACDF in the elderly, is it safer to go posterior ?</td>
<td>Ali Baaj</td>
</tr>
<tr>
<td>14:30 - 14:50</td>
<td>Enabling Technologies for the Care of Elderly Spine Patients: Awake Surgery and Endoscopic Approaches</td>
<td>Mohammed Abd El-Barr</td>
</tr>
<tr>
<td>14:50 - 15:10</td>
<td>Spine Surgery in the elderly: A challenging decision</td>
<td>Amro Alhabib</td>
</tr>
<tr>
<td>15:10 - 15:20</td>
<td>DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>15:20 - 15:30</td>
<td>AWARDS AND ADJOURN</td>
<td></td>
</tr>
</tbody>
</table>
PODIUM ABSTRACT


Introduction
Spinal subdural abscess (SSA) is the least common area of localized infection in the central nervous system. To date, there has been no systematic review of these entities in adults, with the cumulative knowledge of the pathophysiologic, microbiologic, and demographic characteristics of these infections relegated solely to few small series and case reports. Authors aimed to present the outcomes and clinical experience of managing SSA in adults.

Methodology
A systematic review was performed by searching online databases to analyze all reported cases of SSA in adults.

Result
Data on 64 patients were identified and analyzed. The male ratio was 51.56%. The mean age at presentation was 49.17 (range; 87-19) years. Local pain, fever, and weakness were the most frequent symptoms. The lumbar vertebrae were the most frequently involved. The dorsal involvement was involved in 75.00% of the patients, and only 10% had holospinal involvement. The median time between the primary source of infection and the SSA is 38.18 days (720-1 days). The most common isolated organism is Staphylococcus aureus. Fifty-three patients were managed surgically; 11 patients underwent drain insertion, and ten patients received only antibiotics treatment. Forty patients were discharged home, nine patients were discharged to skilled nursing facilities or rehabilitation centers, and ten patients were deceased. The mean follow-up duration was 11.94 months (CI 16.79-7.09). According to ASIA score, the outcome improved in 47 patients after surgical intervention, deterioated in eleven patients, and was unchanged in six patients.

Conclusion
SSA are rare. Prompt diagnosis and management, however, can lead to good outcomes, especially after surgical intervention.

Abstract 2616: Brace-Related Stress and Quality of Life Parameters Between Cheneau Braces and Boston Braces: A Comparative Study on a Sample of Adolescent Idiopathic Scoliosis Patients In Saudi Arabia.

Mr. Khalid Saeed AlHarbi, Professor Abdulmonem Mohammed Alsiddiky, Khalid Saeed AlHarbi, Omar Abdulaziz Ababtain, Abdullah Fahad Alnuwaybit, Mazin Abdulaziz Zamzami, Ahmad Ali Basalah, Wesam Hassan Al-Sabban.

Introduction
Adolescent idiopathic scoliosis (AIS) is the most common spinal deformity that affects healthy children. Despite being asymptomatic and not posing a threat to life, the deformities resulting from AIS can exert a major influence on a patient’s quality-of-life (QoL). In an effort to determine the optimal bracing type for patients diagnosed with Adolescent Idiopathic Scoliosis (AIS), emphasis must be placed on gauging their quality-of-life (Qol) and stress levels. However, there is a dearth of research comparing the effectiveness bracing on these specific parameters particularly in the context of Chêneau and Boston braces.

Methodology
This is a cross-sectional study that was conducted at King Saud University Medical City (KSUMC) in Riyadh, Saudi Arabia. A total of 52 eligible patients were selected via stratified random sampling technique with the type of brace used as the main strata. Data were collected from participants who met our inclusion criteria, which included individuals diagnosed with idiopathic scoliosis, aged 10 years or older, had been wearing a brace for a minimum duration of three months,
and having no previous or current bone or metabolic diseases. The independent samples t-test was used to evaluate significance in this study.

**Result**
The total number of participants treated with Boston brace was 32, while total number of participants treated with Chêneau braces was 20. The total scores of SRS22-r did not show a significant difference between patients who wore Boston braces (0.69±3.68) and those who wore Chêneau braces (0.62±3.49) (p>0.05). Patients who wore Chêneau braces reported significantly lower treatment satisfaction compared to those who wore Boston braces (p<0.001). Additionally, there was a significant difference in Brace-related stress between patients wearing Boston braces (3.72±10.09) in comparison to patients wearing Chêneau Braces (3.25±7.15) (p<0.01).

**Conclusion**
Based on the total score of SRS22- questionnaire, patients with AIS exhibited comparable quality-of-life regardless of the type of bracing used. Nevertheless, individuals who chose Chêneau bracing reported higher levels of stress and lower rates of treatment satisfaction compared to those who chose Boston bracing. Furthermore, despite the majority of AIS cases being females, gender did not appear to influence either quality of life or stress levels of patients. This should pave the way for further research, seeking to enhance care provided to patients by placing greater emphasis on their quality of life and stress levels.

---

**Abstract 2624:** The Safety and Feasibility of Exercise Intervention for Adults with Spinal Metastasis: A Systematic Review.

Ms. Amani A. Aljohi , Assist. Prof. Chris Wilson , Lindsay Brandt , Shana Harrington .

**Introduction**
The spine is the most common location of bone metastases affecting around %20 of adults with cancer. The purpose of this systematic review was to identify the effect of exercise and physical activity interventions that have been previously utilized in adults with metastatic spine disease and to review the reported adverse events.

**Methodology**
A systematic literature search was conducted using PubMed, CINAHL, EMBASE, and PEDro for randomized controlled trials published between January 2011 and June 2023. Extraction was performed by co-author teams, and quality and bias were evaluated using Cochrane Risk of Bias 2.0 (RoB 2).

**Result**
A total of 212 records were assessed, eight of which qualified for inclusion in this review, all of which were from the same two clinical trial protocols. The eight studies included 116 adults with spine metastasis. The exercise interventions included: isometric spinal stabilization exercises supervised for approximately two weeks and continued as home exercises ranging from 12 to 24 weeks. Physical fatigue, pain, and bone density improved significantly with exercise training for individual participants with spine metastasis as shown in the included studies. No adverse events were reported in any study included during the study period.

**Conclusion**
 Appropriately administered and prescribed isometric spinal stabilization exercises appear safe for adults with metastatic spine disease as no adverse events and improvements in several measures such as pain, quality of life, and physical function were reported.

---

**Abstract 2627:** Ao Spine Guideline for the use of Osteobiologics(Aogo) In Anterior Cervical Discectomy and Fusion for Spinal Degenerative Cases.

Professor Waeel Hamouda , Professor
Introduction
To develop an international guideline (AOGO) about use of osteobiologics in Anterior Cervical Discectomy and Fusion (ACDF) for treating degenerative spine conditions.

Methodology
The guideline development process was guided by AO Spine Knowledge Forum Degenerative (KF Degen) and followed the Guideline International Network McMaster Guideline Development Checklist. The process involved 73 participants with expertise in degenerative spine diseases and surgery from 22 countries. Fifteen systematic reviews were conducted addressing respective key topics and evidence were collected. The methodologist compiled the evidence into GRADE Evidence-to-Decision frameworks. Guideline panel members judged the outcomes and other criteria and made the final recommendations through consensus.

Result
Five conditional recommendations were created. A conditional recommendation is about the use of allograft, autograft or a cage with an osteobiologic in primary ACDF surgery. Other conditional recommendations are about use of osteobiologic for single or multi-level ACDF, and for hybrid construct surgery. It is suggested that surgeons use other osteobiologics rather than human bone morphogenetic protein-2 (BMP2-) in common clinical situations. Surgeons are recommended to choose one graft over another or one osteobiologic over another primarily based on clinical situation, and the costs and availability of the materials.

Conclusion
This AOGO guideline is the first to provide recommendations for the use of osteobiologics in ACDF. Despite the comprehensive searches for evidence, there were few studies completed with small sample sizes and primarily as case series with inherent risks of bias. Therefore, high quality clinical evidence is demanded to improve the guideline.

Abstract 2698: Mis Tubular Discectomy vs Conventional vs Endoscopic for Treating Lumbar Disk Herniation: Is any of them a Better Option for Management.

M. D. Khalid Mohd Almadni, Consultant Khalid Mohd Almadni.

Introduction
Surgical procedure for the treatment of lumbar disc herniation is open diskectomy. Minimal invasive discectomy with tubular retractors and endoscopic is hypothesised to cause less tissue damage and result in lower blood loss, less postoperative pain and faster recovery.

Methodology
Case series.

Result
The aim of this study was to compare postoperative and complication rate and outcome of patients undergoing tubular discectomy with those endoscopic and with open conventional approach.

Conclusion
Conventional no difference with tubular, Endoscopic has early better outcome.
Abstract 2605: Treating Disc Prolapse without Surgery, Ozone Nucleoplasty
Assoc. Prof. Shahzad Karim Bhatti,

Introduction
Ozone is a combination of %97 oxygen and %3 ozone and is used in the treatment of low back due to herniated disc. It is a minimally invasive procedure using biochemical properties of ozone resulting in reduced volume of disc. When it is used with peri ganglionic Injection of local anesthetic and small amount of steroid, the effects are more pronounced causing reduction of both disc volume and inflammation resulting in significant pain relief.

Methodology
Percutaneous injection of ozone was given without any form of anesthesia to lumber disc under angio floro guidance at the concentration of 27 micrograms/ml to 49000 patients along with combination of local anesthetic and steroid in peri ganglionic space from January 2008 to March 2022. All the patients presented with clinical signs and symptoms of lumber disc herniation which was verified by MRI lumbo sacral spine. Their pain score was calculated with modified Macnab method.

Result
A satisfactory therapeutic outcome was obtained. %55 of the patients showed complete recovery with resolution of symptoms. %20 of the patients complained of occasional episodic pain with no limitation of occupational activity. %15 of cases showed insufficient improvement. %5 of cases had insufficient improvement and went for surgery. %10 of cases never turned up after the first visit.

Conclusion
Intradiscal ozone for the treatment of herniated discs has revolutionized percutaneous approach to nerve root compression making it safer, economical and easier to repeat without any side effects than treatments currently used in Pakistan.

M. D. Mohammed Awad Elzain.

Introduction
Lumbar disc prolapse is a common neurosurgical problem that, in many instances, may needs surgical intervention, with the attendant risk of serious complications such as long recovery period and the need for large quantities of medications and, sometimes, the need for blood transfusion. The current study aims to evaluate the role of minimally invasive endoscopic interlaminar discectomy, a new modern surgical procedure used to treat lumbar disc herniation and lumber spinal stenosis, in reducing the incidence of complications commonly encountered with traditional surgical procedures.

Methodology
Forty-three patients with lumbar disc prolapse were conveniently selected to undergo endoscopic lumbar discectomy in Mawada hospital, Khartoum-Sudan, in the period from the first of January to the end of December 2017. The score of the Japanese Orthopedic Association (JOA) for Patient with Lumbar Disc Herniation was utilized to assess patients pre and post operatively.

Result
The age range of the study population was 16 to 86 years, with a mean age of 41.88 years. Thirty (%69.8) patients were males while %30.2) 13) patients were females. The most common presentation was lower extremity pain in %100) 43) patients, low backache in %86) 37) patients, lower extremities weakness in %81.4) 33) patients, sensory disturbance in %93) 40) patients, sphincter disturbances in %9.3) 3) patients and gait problems were encountered in %85.3) 30) patients. Lumbosacral MRI showed L5-4 disc herniation in %58.1) 25) patients and L-5S1 disc herniation in %27.9) 12) patients. Upper-level discs were rarely encountered. Discs were founded on the right side in %46.5) 20) patients, on the left side in %44.2) 19) patients and centrally located
in the remaining four (%9.3) patients. Endoscopic interlaminar approach for disc removal revealed only prolapsed disc in %55.8) 24) patients, discs with associated hypertrophied ligamenta flave in %41.8) 18) patients and only one (%2.3) patient had bony canal stenosis. Post operatively, %53.5) 23) patients were cured. %44.2) 18) patients improved and one (%2.3) patient remained static. Six (%14) patients had residual disc that necessitated redo surgery. Complications encountered included surgical site infection in two (%4.7) patients, incidental durotomy with CSF leak in four (%9.3) patients, lower limb weakness in six (%14) patients and one (%2.3) patient was complicated with spinal nerve root injury.

**Conclusion**
Successful results can be achieved in majority of the patients. The Japanese orthopedics association score for assessment of lumbar spine endoscopic surgery was found to be a reliable and sensitive tool for assessing lumbar discs patients both pre and postoperatively and it is advisable to utilize this scale for wide use.

---

**Abstract 2642:** How Frequently does MRI Modify Thoracolumbar Fractures’ classification or Decision-Making? A Systematic Review and Meta-Analysis.


**Introduction**
It is debatable whether MRI can change TLFs’ classification or decision-making sufficiently to justify the increased time, expense, and logistics of getting an MRI in trauma settings. The purpose of this study is to provide the first meta-analysis of the impact of magnetic resonance imaging (MRI) on thoracolumbar fractures (TLFs) classification and decision-making.

**Methodology**
A systematic review was conducted following PRISMA guidelines. We searched PubMed, Scopus, Cochrane, and Web of Science from inception to 30 June 2023 for studies evaluating the change in TLFs classification and treatment decisions after MRI. The studies extracted key findings, objectives, and patient population. A meta-analysis was performed for the pooled frequency of change in AO fracture classification or treatment decisions from surgical to conservative or vice versa after MRI.

**Result**
This meta-analysis included four studies comprising 554 patients. The pooled frequency of change in TLFs classification was %95) %17 CI: %9 to %31), and treatment decision was %22 %95) CI: %11 to %40). An upgrade from type A to B was reported in %95) %15.7 CI: 7.2 % to %30.6), and downgrading type B to A in %95) %1.2 CI: 0.17 to %8.3). A change from conservative to surgery recommendation of %95) %17 CI: %5.0 to %43) was higher than a change from surgery to conservative %95) %2 CI: %1 to %34).

**Conclusion**
MRI can significantly change the thoracolumbar classification and decision-making, primarily due to upgrading type A to type B fractures and changing from conservative to surgery, respectively. These findings suggest that MRI could change decision-making sufficiently to justify its use for TLFs. Type A subtypes, indeterminate PLC status, and spine regions might help to predict a change in TLFs’ classification. However, more studies are needed to confirm the association of these variables with changes in treatment decisions to set the indications of MRI in neurologically intact patients with TLFs.

---

**Abstract 2645:** Influence of Work-Related Safety and Health Guidelines on knowledge and prevalence of occupational back pain among Rehabilitation nurses in Saudi Arabia: A -6month follow-up.

PhD Hani Alabbad.
Introduction
Nurses are frequently involved in different types of patient handling activities in different departments of the hospitals. Mishandling the patients causes accumulative stress on their spine that results in occupational back pain (OBP), substantial morbidity, and incurred cost. Objectives: This study aimed to observe the influence of work-related safety and health guidelines on knowledge and prevalence of occupational back pain among rehabilitation nurses in Saudi Arabia.

Methodology
This cohort study was conducted with the inclusion of a total of 116 registered rehabilitation nurses (mean age = 39.6 years). Following the invitation, these nurses attended an ergonomic workshop focusing on work-related safety and patient handling guidelines, risk assessment, and control of OBP. A self-administered questionnaire was used to assess the knowledge, risk, and prevalence of OBP at baseline and -6month follow-up.

Result
The perceived knowledge score significantly improved (%95 CI; t = 4.691; p < 0.001; Cohen’s d = 0.72) at -6month follow-up mean (SD) = 18.2) 81.6) from its baseline score mean (SD) = 19.2) 68.2). Likewise, the prevalence score of OBP markedly reduced from %71.5 (baseline) to %65.0month follow-up).

Conclusion
The level of knowledge highly improved and the prevalence of OBP markedly reduced within a span of 6 months among rehabilitation nurses in Saudi Arabia after attending an ergonomic workshop. Importantly, the nurses learned and geared up themselves for practicing the safe patient handling guidelines to avoid occupational back pain in the future. Therefore, rehabilitation nurses should update their knowledge and awareness about occupational safety and health guidelines, risk assessments, and control of OBP at a regular interval for increasing the knowledge and reducing the prevalence of OBP among them.


Others Hamzah M Magableh, Sufyan Ibrahim, Zachary Pennington Karim Rizwan Nathani, Sarah Johnson, Konstantinos Katsos, Brett A Freedman, Mohamad Bydon.

Introduction
Enhanced Recovery After Surgery (ERAS) protocols aim to optimize patient outcomes by reducing the surgical stress response, expediting recovery, and reducing care costs. Our aim is to evaluate the impact of implementing ERAS protocols on the perioperative surgical outcomes and financial implications associated with spine surgeries.

Methodology
A systematic review and meta-analysis of peer-reviewed studies directly comparing outcome differences between spine surgeries performed with and without utilization of ERAS pathways was conducted along PRISMA guidelines.

Result
Of 676 unique articles identified, 59 with 15,198 aggregate patients (7,748 ERAS; 7,450 non-ERAS) were included. ERAS-treated patients had shorter operative times (Mean Difference, MD: 10.2 mins; p<0.01), shorter hospitalizations (MD: 1.41 days, p<0.01), fewer perioperative complications (RR=0.64, p<0.01), lower postoperative opioid use (MD of morphine equivalent dose: 164.36mg; p<0.01), and more rapid mobilization/time to first out-of-bed ambulation (MD: 0.92 days; p<0.01). Spine surgeries employing ERAS were also associated with lower total costs (MD: 1140.26$/patient; p<0.01), especially in the USA (MD: 2869.11$/patient, p<0.01) and lower postoperative visual analog pain scores (MD=0.61, p<0.01), without any change in odds of -30day readmission (RR: 0.80, p=0.13) or reoperation (RR: 0.88, p=0.60). Sub-analyses based on the region of spine showed significantly lower LOS in both cervical and lumbar surgeries implementing ERAS. Type of procedure showed a significantly
lesser time-to-initiate mobilization in fusion surgeries utilizing ERAS protocols compared to decompression.

Conclusion
The present meta-analysis indicates that current literature supports ERAS implementation as a means of reducing care costs and safely accelerating hospital discharge for patients undergoing spine surgery.


Introduction
Anterior cervical decompression and fusion (ACDF) is the surgical standard of care for degenerative cervical myelopathy (DCM). It remains unknown whether ACDF with exoscope (EX) is associated with similar outcomes compared to ACDF with operating microscope (OM). Therefore, we conducted a systematic review and meta-analysis to compare outcomes between ACDF with EX and OM.

Methodology
On May 2023, a comprehensive literature search was conducted using PubMed, Scopus, Web of Science, and Google Scholar. Articles that compare ACDF with EX and OM were included. Study characteristics, surgical characteristics, and clinical outcomes were extracted. Standardized mean differences (SMD) and odds ratios (OR) along with 95% confidence intervals (CI) were calculated.

Result
Four studies with 164 patients were included. Clinically, visual analogue scale (VAS) was comparable between EX and OM, both at 90 days (SMD = 0.07 CI = 0.23- to 0.36, P-value = 0.66) and 365 days (SMD = 0.26 CI = 0.54- to 0.02, P-value = 0.07). EX was associated with a lower Japanese Orthopedic Association (JOA) Score (SMD = 0.26 CI = 0.53- to 0.06, P-value = 0.01). Neck disability index was comparable between the groups (SMD = 0.30 CI = 0.38- to 0.21, P-value = 0.58), as was blood loss (SMD = 0.18 ml CI = 0.50- to 0.13, P-value = 0.26) and operative time (SMD = 0.19 min CI = 0.51- to 0.14, P-value = 0.26). Surgical complications were low in both groups and there was no statistically significant difference between the groups (pooled OR = 0.40 CI [0.15, 0.04] p=0.44).

Conclusion
Based on early experience, ACDF with EX is a feasible alternative to ACDF with OM regarding clinical outcomes. Future prospective, comparative studies are needed to better elucidate differences between the two techniques.

Abstract 2655: Stem cell therapy for traumatic spinal cord injury: Where do we stand?

Professor Mir Sadat-Ali.

Introduction
Traumatic spinal cord Injury (SCI) is a devastating injury that occurs 54 per million population yearly, and 50% remain paralyzed for life. Given this figure, 1620 men and women in Saudi Arabia get SCI, and only 20 improve, and the rest, 1296 remain paralyzed. The development of innovative treatments for SCI is eagerly contemplated, and Stem cell therapy (SCT) is one of the anticipated lights at the end of the tunnel. The objective of this review is to elucidate the present position of stem cell research in SCI and where Saudi Arabia stands in the international community in research on the recovery of SCI.

Methodology
A literature search was conducted using PubMed, Scopus, Web of Science, and Google Scholar. Articles that compare ACDF with EX and OM were included. Study characteristics, surgical characteristics, and clinical outcomes were extracted. Standardized mean differences (SMD) and odds ratios (OR) along with 95% confidence intervals (CI) were calculated.
of traumatic Spinal cord injury, stem cell therapy. The criteria for analysis included articles involving case reports and clinical trials. The authors evaluated all the data independently, and there was no discrepancy in the papers selected for the review. Analysis between the reported outcomes of each cell type was performed according to gold-standard efficacy outcome measures like the ASIA impairment scale, and motor and sensory scores.

Result
Currently, 1,149 clinical trials are focused on improving outcomes after SCI are registered in the U.S. National Library of Medicine at www.clinicaltrials.gov. This review encompasses 145 studies with >4000 patients. Five different types of cell origin (Autologous and Allogenic Bone marrow, Autologous Adipose Tissue derived, umbilical cord MSCs and Neurocytes, Schwann cells (SCs), Olfactory ensheathing cells, with and without scaffold was used. The number of cells injected varied between 20-5 X106. The site of injections and the number of injections varied between 3-1. The site was intra-thecal, venous, and arterial access. The overall improvement of ASIA Impairment Scale (AIS) grade conversion rates (improvements in %40 of transplanted patients), which surpassed the spontaneous improvement rate expected for complete chronic SCI patients (%20–5). There were no clinical studies on SCI from Saudi Arabia, and there was one preclinical study.

Conclusion
Considerable progress in the treatment of spinal cord injury has been made in recent decades using stem cell therapy. Overall, the results indicated that although the efficacy of stem cell therapy is encouraging. At present clinical trials have issues such as small sample sizes, poor design and, control, and blinding. The most important finding was that SCI is not a static disease, and multimodal treatment is necessary for better results. Although much work remains to be completed in this field, but the future is bright. We believe that Spine Surgeons in Saudi Arabia should actively participate in clinical trials of treating patients with SCI using stem cell therapy.

Abstract 2663: The accuracy of artificial intelligence as clinical decision support system in diagnosing cervical radiculopathy due to disc herniation and spondylolytic.

Ms. Almaha Khalid Alzahrani.

Introduction
Neck pain is one of the most prevalent musculoskeletal conditions worldwide, even in Saudi Arabia, and cervical radiculopathy is one of the most important causes of these problems. MRI is used worldwide as the ideal diagnostic tool to diagnose these problems, but they are expensive for many patients. Meanwhile, others may suffer from other health diseases that prevent them from undergoing these radiations, which prevents them from diagnosing the condition more appropriately. Considering these factors, artificial intelligence could be an appropriate, accurate, and suitable model for diagnosing cervical radiculopathy. Therefore, the objective of this study was to compare the accuracy of an AI-enabled platform and an Algorithm as a Clinical Decision Support System (CDSS) versus MRI in diagnosing patients affected with cervical disc herniation and spondylolysis.

Methodology
Ninety-two male and female patients above 18 years of age who suffer from neck pain were included in the study. The personal and clinical history was taken using the Therapha™ software on the same day or 2 to 3 days before the patient undergoes an MRI. First, the Delphi method was used for ten cases to define expert consensus for software. Then, the diagnostic accuracy of AI was determined in terms of sensitivity and specificity compared with MRI.

Result
The results of the Delphi method showed that the Therapha™ software had a %100 agreement for nine cases and %80 agreement for one case by the experts for the diagnosis. The software showed a high sensitivity (%89.5) and specificity (%62.5) in diagnosing cervical radiculopathy compared with MRI.
Conclusion
The study results conclude that the Therapha™ software showed high sensitivity and specificity in diagnosing cervical radiculopathy. So thereby, the AI could be used to diagnose cervical radiculopathy, which could be highly recommended in rehabilitation centers where highly sophisticated radio-diagnostic facilities are unavailable.

Abstract 2665: Anterior discectomy and fusion versus posterior foraminotomy in treatment of cervical radiculopathy: a comparative prospective study. They were divided into 2 groups; group (A) include 23 patients underwent ACDF and group (B) included 21 patients underwent PCF, with 1 year follow up. The patient age, sex, clinical manifestations, surgical outcomes as number of cervical level, operative time, blood loss, complications and length of hospital stay were recorded. Visual analogus scale (VAS) and neck disability index (NDI) were used for evaluation of clinical outcomes. Postoperative imaging was done after 1 year to detect instability or adjacent level degeneration.

Result
Clinical improvement of the mean values of VAS and NDI were more pronounced in PCF group as compared to ACDF group with statistically significant difference.

Conclusion
Posterior cervical foraminotomy is a safe and effective technique for the treatment of cervical radiculopathy as compared to anterior cervical discectomy and fusion.


Introduction
The Pain Behavioral Scale (PaBS) measures the presence and severity of pain behavior. We examine the longitudinal construct validity of the PaBS using convergent and known-groups approaches on a population of 23 participants with chronic lower back pain (LBP) undergoing routine physiotherapy care and pain neuroscience education.

Methodology
Participants who satisfied study inclusion and exclusion criteria were recruited from patients who attended two testing sessions at physiotherapy clinics in Saudi Arabia. Participant pain behavior was initially measured using the PaBS scale; participants performed standardized physical tests (e.g., repeated trunk flexion) and provided baseline demographic, clinical data, and self-reported measurements using the Modified Roland and Morris disability questionnaire (MODI), fear-avoidance questionnaire (FABQ), and pain catastrophizing scale (PCS). In subsequent visits, a physiotherapist provided usual care to participants, and weekly sessions were established for online pain-neuroscience education. During week six, participants repeated the same questionnaires and physical performance tests with the PaBS. Paired t-tests are used to compare changes in health characteristics from baseline responses to those in week six. Correlations between changes in PaBS from baseline to week six, with changes in outcome measures (i.e., disability, pain intensity, fear-avoidance beliefs, catastrophizing), were determined. To assess known-group validity, we also used a general linear model.

Result
A total of 23 participants completed the PNE and follow-up data collection. The mean change from baseline in the PaBS score was statistically significant, as were changes in MODI, FABQ, and PCS. Almost %70 of participants improved their PaBS scores over the six-week period, with PaBS scores of almost %40 of them improving by three
The change in PaBS score correlated significantly with changes in the PCS-rumination subscale, supporting a proposed approach to estimate convergent validity ($r = 0.95, 0.44$ CI = 0.72–0.04, $p = 0.035$).

**Conclusion**

The mean change from baseline in the PaBS score is statistically significant, as are changes in MODI, FABQ, and PCS, supporting its convergent validity. According to our STarT Back groups, the medium to low-risk group had a lower PaBS score and high-risk group had a higher PaBS score, indicating that PaBS use in clinical assessment may identify people according to pain-behavior severity, or those at increased risk of developing disability.

**Abstract 2677:** Number of levels fused: an indicator of hardware failure following minimally invasive antepsoas fusion.

Mr. Rehan R Khan, Student Rutvin J Kyada, Aziz Saade Hayley M Denwood, Mirna N Chahine, Henry Hojoon Seo, Tony Tannoury, Chadi Tannoury.

**Introduction**

Multi-level fusions have historically shown greater operative and postoperative risks. The minimally invasive antepsoas (MIS-ATP) technique for fusions has provided minimally invasive spine surgeons better L-5S1 access. When avoiding the psoas muscle retraction, some postoperative complications such as thigh pain, are less likely to occur. Nevertheless, hardware-related complications following the MIS-ATP technique may hinder the postoperative recovery course and may warrant a revision surgery. The purpose of this study is to assess the rates of postoperative hardware-related complications of patients with differing numbers of vertebral levels fused via the MIS-ATP approach.

**Methodology**

This is a retrospective cohort study of 395 patients who underwent MIS-ATP lumbosacral fusions between 2018-2006 with > 2 years of followup. The specific hardware related complications included proximal junctional related diseases, pedicle screw related complications, screw lucency, iliac screw related complications, and rod breakage and failure. Several covariates were obtained including demographic variables, BMI, diabetes status, smoking status, and number of previous spine surgeries. Univariate associations were analyzed using independent two samples t-tests and chi-square analyses. Multivariable logistic regression was used to assess for the association between number of levels fused and the odds of having a hardware complication.

**Result**

75 patients experienced postoperative hardware related complications (Table 2). Univariate analyses showed that patients with complications were older ($p = 0.008$), had longer follow-up durations ($p < 0.001$), and had more spinal levels fused ($p = 0.008$) (Table 1). Simple logistic regression showed that for each additional vertebral level fused, there was a trend of 13.4% increase in the odds of having a hardware-related complication, (crude OR = 1.30-0.99) 1.13), $p = 0.075$), whereas multivariable logistic regression found no association (adjusted OR = 1.26-0.92) 1.08), $p = 0.334$), when controlling for covariates (Table 3).

**Conclusion**

Although there was a crude association between increasing numbers of spinal levels fused and odds of having a hardware complication, demographic and lifestyle variables and prior surgical history explain much of this association. This was shown using the multivariable logistic regression, which found that when controlling for the most influential covariates from the univariate analysis the association between increasing levels fused and hardware complications did not hold, suggesting that other factors like age, smoking status, BMI, and previous spinal procedures likely account for the crude association between number of spinal levels fused and hardware related complication rate (Table 3). Due to the increased morbidity posed by hardware failure and its complications and given that patients undergoing surgery with larger fusion levels tend to have poorer health, future studies should
explore the mechanisms through which lifestyle factors can intervene between the procedure and the development of a hardware complication.

---

**Abstract 2683:** Experience with unilateral dual portal endoscopic tiff using expandable cages: Initial case series.

M. D. Alhareth Salem Maaya, Professor Jin Hwa Eum

**Introduction**

Unilateral Dual Portal endoscopic transforaminal lumbar interbody fusion (TLIF) has emerged as a minimally invasive surgical technique for treating lumbar degenerative conditions. The use of expandable cages in this procedure offers potential advantages in achieving optimal fusion and clinical outcomes. This study presents the initial experience of performing unilateral Dual Portal endoscopic TLIF with expandable cages in the first six cases.

Professor Ali Ahmed Abdelaleem, Professor Ahmed Abdalla Kelany

**Result**

Clinical improvement of the mean values of VAS and NDI were more pronounced in PCF group as compared to ACDF group with statistically significant difference.

**Conclusion**

Posterior cervical foraminotomy is a safe and effective technique for the treatment of cervical radiculopathy as compared to anterior cervical discectomy and fusion.

---

**Abstract 2667:** An assessment of the longitudinal construct validity of the pain behavioural scale (pabs) in a saudi population with chronic low back pain: A preliminary study.


**Introduction**

The Pain Behavioral Scale (PaBS) measures the presence and severity of pain behavior. We examine the longitudinal construct validity of the PaBS using convergent and known-groups approaches on a population of 23 participants with chronic lower back pain undergoing routine physiotherapy care and pain neuroscience education.

**Methodology**

Participants who satisfied study inclusion and exclusion criteria were recruited from patients who attended two testing sessions at physiotherapy clinics in Saudi Arabia. Participant pain behavior was initially measured using the PaBS scale; participants performed standardized hospital stay were recorded. Visual analogus scale (VAS) and neck disability index (NDI) were used for evaluation of clinical outcomes. Postoperative imaging was done after 1 year to detect instability or adjacent level degeneration.
physical tests (e.g., repeated trunk flexion) and provided baseline demographic, clinical data, and self-reported measurements using the Modified Roland and Morris disability questionnaire (MODI), fear-avoidance questionnaire (FABQ), and pain catastrophizing scale (PCS). In subsequent visits, a physiotherapist provided usual care to participants, and weekly sessions were established for online pain-neuroscience education. During week six, participants repeated the same questionnaires and physical performance tests with the PaBS. Paired t-tests are used to compare changes in health characteristics from baseline responses to those in week six. Correlations between changes in PaBS from baseline to week six, with changes in outcome measures (i.e., disability, pain intensity, fear-avoidance beliefs, catastrophizing), were determined. To assess known-group validity, we also used a general linear model.

### Result
A total of 23 participants completed the PNE and follow-up data collection. The mean change from baseline in the PaBS score was statistically significant, as were changes in MODI, FABQ, and PCS. Almost 70% of participants improved their PaBS scores over the six-week period, with PaBS scores of almost 40% of them improving by three units or more. The change in PaBS score correlated significantly with changes in the PCS-rumination subscale, supporting a proposed approach to estimate convergent validity ($r = 95, 0.44 CI = 0.72–0.04, p = 0.035$).

### Conclusion
The mean change from baseline in the PaBS score is statistically significant, as are changes in MODI, FABQ, and PCS, supporting its convergent validity. According to our STarT Back groups, the medium to low-risk group had a lower PaBS score and high-risk group had a higher PaBS score, indicating that PaBS use in clinical assessment may identify people according to pain-behavior severity, or those at increased risk of developing disability.

### Abstract 2677: Number of levels fused: an indicator of hardware failure following minimally invasive antepsoas fusion.

Mr. Rehan R Khan, Student Rutvin J Kyada, Aziz Saade, Hayley M Denwood, Mirna N Chahine, Henry Hojoon Seo, Tony Tannoury, Chadi Tannoury.

### Introduction
Multi-level fusions have historically shown greater operative and postoperative risks. The minimally invasive antepsoas (MIS-ATP) technique for fusions has provided minimally invasive spine surgeons better L-5S1 access. When avoiding the psoas muscle retraction, some postoperative complications such as thigh pain, are less likely to occur. Nevertheless, hardware-related complications following the MIS-ATP technique may hinder the postoperative recovery course and may warrant a revision surgery. The purpose of this study is to assess the rates of postoperative hardware-related complications of patients with differing numbers of vertebral levels fused via the MIS-ATP approach.

### Methodology
This is a retrospective cohort study of 395 patients who underwent MIS-ATP lumbosacral fusions between 2018–2006 with > 2 years of followup. The specific hardware related complications included proximal junctional related diseases, pedicle screw related complications, screw lucency, iliac screw related complications, and rod breakage and failure. Several covariates were obtained including demographic variables, BMI, diabetes status, smoking status, and number of previous spine surgeries. Univariate associations were analyzed using independent two samples t-tests and chi-square analyses. Multivariable logistic regression was used to assess for the association between number of levels fused and the odds of having a hardware complication.

### Result
75 patients experienced postoperative hardware related complications (Table 2). Univariate analyses showed that patients with complications were older ($p = 0.008$), had longer follow-up durations ($p < 0.001$), and had more spinal levels fused ($p = 0.008$) (Table 1). Simple logistic regression showed
that for each additional vertebral level fused, there was a trend of %13.4 increase in the odds of having a hardware-related complication, (crude OR = 1.30-0.99) (1.13), p = 0.075), whereas multivariable logistic regression found no association (adjusted OR = 1.26-0.92) (1.08), p = 0.334), when controlling for covariates (Table 3).

Conclusion
Although there was a crude association between increasing numbers of spinal levels fused and odds of having a hardware complication, demographic and lifestyle variables and prior surgical history explain much of this association. This was shown using the multivariable logistic regression, which found that when controlling for the most influential covariates from the univariate analysis the association between increasing levels fused and hardware complications did not hold, suggesting that other factors like age, smoking status, BMI, and previous spinal procedures likely account for the crude association between number of spinal levels fused and hardware related complication rate (Table 3). Due to the increased morbidity posed by hardware failure and its complications and given that patients undergoing surgery with larger fusion levels tend to have poorer health, future studies should explore the mechanisms through which lifestyle factors can intervene between the procedure and the development of a hardware complication.


M. D. Alhareth Salem Maaya, Professor Jin Hwa Eum.

Introduction
Unilateral Dual Portal endoscopic transforaminal lumbar interbody fusion (TLIF) has emerged as a minimally invasive surgical technique for treating lumbar degenerative conditions. The use of expandable cages in this procedure offers potential advantages in achieving optimal fusion and clinical outcomes. This study presents the initial experience of performing unilateral Dual Portal endoscopic TLIF with expandable cages in the first six cases.

Methodology
A retrospective analysis was conducted on five consecutive patients who underwent unilateral Dual Portal endoscopic TLIF with expandable cages. Clinical data, surgical details, intraoperative findings, perioperative outcomes, radiological assessments, and postoperative follow-up were evaluated. The expandable cage was utilized to restore disc height, promote fusion, and provide stability.

Result
The mean age of the patients was 55 years old, and %66 were male. The procedure was successfully performed in all cases, with minimal blood loss and no intraoperative complications. Postoperative pain scores showed %83 improvement in a 3-week period. Radiographic assessments demonstrated adequate cage placement, indicating favorable cage placement and early signs of fusion. Early follow-up evaluations indicated favorable and faster recovery in comparison to static cages with %83 of patients reporting satisfactory pain relief and improved functional status.

Conclusion
The initial experience with unilateral Dual Portal endoscopic TLIF utilizing expandable cages in the first six cases has shown promising results. The procedure appears to provide effective disc height restoration, stability, and early signs of fusion, leading to favorable clinical outcomes. Further studies with larger patient cohorts and longer follow-up are warranted to validate the benefits of this technique in comparison to traditional approaches.

Abstract 2696: Hardware-related complications in patients with transitional lumbosacral anatomy following minimally invasive inteposes surgery (MIS-ATP).

Mr. Nader El Hajj, M. D. Aziz Saade, M. D. Tony
Introduction
Transitional lumbosacral anatomy (lumbarization of S1 and sacralization of L5) is present in almost 30% of the population and may pose higher risks of surgical complications, which may include higher rates of blood loss, vascular injuries, and misplaced hardware. While prior studies have examined the intraoperative surgical complications posed by the presence of transitional spine anatomy, few have evaluated the rates of postoperative hardware complications. The aim of this study is to assess the rate of hardware-related complications in patients with transitional lumbosacral anatomy (TLA) following the MIS-ATP.

Methodology
To assess rates of postoperative complications in patients with TLA, a sample of patients with TLA was case-matched with a randomly sampled group of patients with standard lumbosacral anatomy (SLA). The samples were subcategorized into short (3-2 levels) and long (+4 levels) fusion. A chart review was conducted to determine estimated blood loss (EBL), wound and hardware complications, adjacent segment disease (ASD), and pseudoarthrosis. Additional variables such as smoking, BMI, and prior surgeries were also measured. The odds ratio was calculated to determine significance with a 95% confidence interval for the complications, while an unpaired T-test assessed significance for EBL.

Result
A significant difference was seen between SLA and TLA patients regarding overall complications in both short and long-fusion groups. TLA Patients undergoing long fusion have 3 times the odds of developing hardware failure in general; specifically, they have 5.12 times the odds of developing ASD than patients with SLA undergoing long fusion. TLA patients have 5.57 times the odds of developing general hardware complications and 5.59 times the odds of developing ASD. However, there were no significant differences for all other variables. Interestingly, a significant difference in EBL was noted between TLA and SLA patients in the short fusion group.

Conclusion
This study indicates a significant increase in overall complications experienced by patients with TLA undergoing MIS-ATP. While it is difficult to predict the development of ASD, it is important to note that patients with transitional anatomy may be at higher odds of requiring revision surgery or extension of hardware from prior lumbar fusion. All patients are informed about the risks of minimally invasive lumbar fusion; however, it may be pertinent to inform patients with transitional anatomy about the increased risk of developing ASD and the resulting recurring pain. The difference in rates of ASD may be due to hypermobility in vertebrae adjacent to the lumbosacral junction and changes in load bearing posed by transitional anatomy. Despite a prior study indicating no significant difference in blood loss between TLA patients and SLA patients, our results indicate otherwise for patients undergoing short fusion lumbar surgery, highlighting a subject for future research.

Abstract 2697: Successful outcome of treating spinal ABC with denosumab in a paediatric patient: A case report and literature review.
M. D. Mohammed AlRushud, M. D. Fawaz Alshaalan, M. D. Sultan Aldebayan, M. D. Faisal Konbaz.

Introduction
In this paper, we present an 8-year-old girl with spinal ABC secondary to osteoblastoma at the level of C3. The patient is not a candidate for complete surgical resection of the mass due to its proximity to the vertebral artery. At our center, we opted to treat this patient with denosumab which has been reported to have successful outcome as an off-label treatment for ABC in both adult and pediatric populations. Unfortunately, there are not well-established guidelines for the treatment of ABCs with denosumab in terms of dosage, frequency, or length of treatment.

Methodology
All PubMed indexed papers since 2010 we reviewed for reports of patient outcome following...
a denosumab treatment regiment. We reviewed each patient in terms of demography, clinical presentation, regimen, outcome, recurrence and adverse effects.

Result
Unfortunately, there are not well-established guidelines for the treatment of ABCs with denosumab in terms of dosage, frequency, or length of treatment. In our literature review, we found that most reported cases for adults used the same protocol for Giant Cell Tumors (GCTs) while in the paediatric population the recommended protocol consisted of sc 70 mg/m2 weekly for 1 month as a loading dose followed by monthly doses. Most paediatric patients were treated for a total of 12 months but symptomatic improvement was reported in some papers as early as 3 months following initiation of treatment.

Conclusion
From our literature review and the successful outcome of our case, we believe that denosumab has the protentional to be an important tool for spine surgeons in the treatment of ABCs. This is specially true for complex patients with tumors unamiable to surgical resection due to location or proximity to vital structures such as in this case. However, further research is warranted in order to further illustrate the efficacy of denosumab therapy for ABC and to establish and ideal regimen that would take into account risks and benefits from the treatment.


Professor Waeel Hamouda, Professor Alexander Vaccaro, Mark Lambrechts Brian Karamian, Jose Canseco, Cumhur Oner, Emiliano Vialle, Shanmuganathan Rajasekaran, Marcel Dvorak, Lorin Benneker, Frank Kandziora, Mohammad El-Sharkawi, Jin Wee Tee, Richard Bransford, Andrei Joaquim, Professor Sander Muijs, Professor Martin Holas, Professor Masahiko Takahata, Professor Rishi Kanna, Professor Klaus Schnake, Professor Christopher Kepler, Professor Gregory Schroeder.

Introduction
Prior upper cervical spine injury classification systems have focused on injuries to the crano-cervical junction (CCJ), atlas, and dens independently. However, no previous system has classified upper cervical spine injuries using a comprehensive system incorporating all injuries from the occiput to the C3–2 joint. The purpose of this study was to determine the accuracy of experts at correctly classifying upper cervical spine injuries based on the recently published AO Spine Upper Cervical Injury Classification System and to determine their inter-observer reliability and to identify the intra-observer reproducibility of the experts.

Methodology
This is an international Multi-Centre Survey where thirteen international AO Spine Knowledge Forum Trauma members participated in two live webinar-based classifications of 29 upper cervical spine injuries presented in random order, four weeks apart. Percent agreement with the gold-standard and kappa coefficients (k) were calculated to determine the interobserver reliability and intra observer reproducibility.

Result
Raters demonstrated %80.8 and %82.7 accuracy with identification of the injury classification (combined location and type) on the first and second assessment, respectively. Injury classification intra observer reproducibility was excellent (mean, [range] k=1.00-0.58] 0.82)). Excellent interobserver reliability was found for injury location (k = 0.922 and k=0.912) on both assessments, while injury type was substantial (k=0.689 and 0.699) on both assessments. This correlated to a substantial overall interobserver reliability (k=0.729 and 0.732).

Conclusion
Early phase validation demonstrated classification of upper cervical spine injuries using the AO Spine Upper Cervical Injury Classification System to be accurate, reliable, and reproducible. Greater than %80 accuracy was detected for injury classification.
The intra observer reproducibility was excellent, while the interobserver reliability was substantial.

Abstract 2706: Virtual scoliosis-specific exercises (seas) with home-based application of kinesio taping versus clinical-based routine physiotherapy for adolescents with moderate adolescent idiopathic scoliosis.

Instructor Ameer Abdullah Almubarak.

Introduction
There are several exercise protocols put in clinical physiotherapy practice for adolescent-idiopathic scoliosis (AIS); But there is need for comparable studies on the effectiveness of different exercise interventions based on delivery mode. In our previous study, we compared virtual scoliosis-specific self-exercise (SEAS) with routine clinical-based spinal stabilization and stretching exercise. In this study, we compared combination of Virtual SEAS and pre-cut, parent applied kinesio taping (KT) with clinical-based core stretching/stabilization exercise. We assumed that presenting SEAS virtually via phone calls or social media apps with self/parent taping would increase adherence to exercise and minimize potential adverse events for adolescents complained of idiopathic scoliosis.

Methodology
Twenty-two males with AIS, who have moderate curves (less than 45 degrees), were randomly divided into two groups. In addition to brace wearing for 12 weeks, one group received clinical-based core stretching/stabilization exercise and home instructions to continue exercise, while the other group received combination of Virtual SEAS in the form of phone calls, recorded video clips or live chat in Zoom or WhatsApp; Clips contained scientific exercises approach to scoliosis exercise therapy in addition to pre-cut, parents applied KT. There was no physical attendance in physiotherapy and all instructions and support delivered electronically. The outcome measures were based on Cobb angle measured via upright x-ray, Risser’s sign and quality of life.

Result
Cobb angles and Risser signs improved for both groups. However, it was slightly better for routine physiotherapy group. Quality of life slightly changed in both groups. The pain domain of the Scoliosis Research Society (Sr22-) questionnaire improved in both groups.

Conclusion
Although continuous monitoring of virtual SEAS exercise and KT. Those who attend physiotherapy sessions showed slightly better improvement. Although Virtual SEAS showed effectiveness in reducing cobb’s angle. The improvement was relatively small. We concluded that combination of both Virtual SEAS and KT should support but not replace routine physiotherapy for adolescents with idiopathic scoliosis.

Abstract 2641: Multi-Centre Validation Of Ct Criteria For Thoracolumbar Posterior Ligamentous Complex Injury: Preliminary Results


Introduction
Two recent single-institution studies have proposed criteria for posterior ligamentous complex (PLC) status in Computed Tomography (CT) based on the number of positive CT findings. PLC should be considered injured if ≥ 2 positive CT findings based on a high positive predictive value (PPV, %91) for PLC injury in MRI, indeterminate PLC (M1 modifier) if there is a single positive CT finding (PPV %31), and intact if there are no positive CT findings (PPV %9). This retrospective multicenter study aims to validate those CT criteria for PLC injury in a large, independent population from different settings.

Methodology
Three hundred fifty-seven consecutive patients with at least one vertebral body fracture (T-1L5) who underwent CT and MRI within ten days of injury will be enrolled in participating centers. Patients with translation injury, osteoporotic or...
pathological fractures or incomplete imaging were excluded. At least two reviewers from each center will assess CT for the following findings according to proposed definitions: facet joint malalignment, facet joint widening, horizontal laminar fracture, spinous process fracture, and interspinous widening. The reference standard is PLC injury defined by black stripe discontinuity due to supraspinous or ligamentum flavum rupture. Each reviewer will interpret all de-identified CT/MRI images independently, blinded to clinical data and other readings, within a 4-week interval. When the two reviewers disagreed about the MRI’s PLC status or the Number of CT findings, the case was resolved by a third reviewer. Prior consensus training will be done for all reviewers to standardize the imaging interpretation protocol. Multivariate association between CT findings and PLC injury will be examined.

Result
The preliminary results from multiple centers will be presented. The diagnostic accuracy of combinations of those CT findings with independent association with PLC injury will be examined (2 ≥ , 1 ≥ , 0 findings). The following measures will be reported: sensitivity, specificity, accuracy, positive and negative predictive values, and positive and negative likelihood ratio. Inter-intraobserver reliability in identifying each CT finding or combinations of CT findings will be assessed using Cohen’s kappa (κ) and Fleiss kappa statistics.

Conclusion
We provided preliminary results of the first multicenter validation of a CT criteria for PLC injury. A multicenter design is needed to improve the generalizability of the findings. A retrospective study with well-balanced study population is more feasible than a prospective design.

Abstract 2708: Effects of short term space travel on spinal health: Insights from an MRI study on astronauts.

M. D. Rakan Bokhari, PhD Daniel Bisson, Pablo Ingelmo, Jean Ouellet.

Introduction
As space tourism becomes increasingly accessible to the general public, it becomes necessary to better understand the effects of microgravity on the human body. Low back pain (LBP) is one of the most commonly encountered complaints in the general population and its prevalence increases with age. LBP is also a very frequently encountered complaint reported by astronauts, both during space travel and after their return to Earth. Characterizing the changes in the spinal column and the underlying mechanisms will help better understand the effects of microgravity on the human spine; and may provide therapeutic or prophylactic venues. However, not much is available on the biochemical changes in the IVD with space travel.

Methodology
We enrolled two astronauts recruited for a 17-day space mission. They were imaged pre-flight, as well as immediately post-flight and at 3 months. Lumbar IVD water and glycosaminoglycan (GAG) content was assessed using DIXON water-only phase and T1rho MRI imaging modalities.

Result
Heterogeneous changes were seen in the IVDs and PSM of both astronauts. One astronaut saw a decrease in water and GAG content, while the opposite was seen in the other. These changes in the IVD with space flight appeared correlated to the extent of baseline degeneration. In the case of PSMs, changes in volume and fatty infiltration were also heterogeneous between astronauts. Interestingly, changes did not yet stabilize at last follow up time point of 3 months.

Conclusion
This work adds to the growing body of evidence demonstrating a deleterious effect of even short periods of space travel on spine health. We demonstrate that even short periods of microgravity are associated with biochemical changes believed to underlie disc degeneration. In addition, we show that these changes may continue to progress beyond 3 months after space flight.
return from space.

Abstract 2710: Shoulder level changes after minimally invasive anterior to PSOAS (ATP) fusion in adult scoliosis patients.

Mr. Henry Hojoon Seo, Mr. Robert Azario, Mr. Nader El Hajj, M. D. Aziz Saade, M. D. Chadi Tannoury, M. D. Tony Tannoury.

Introduction
Postoperative shoulder balance is one of the most important post-surgical outcomes determining the success of scoliosis correction surgery. Minimally invasive antepsoas (MIS-ATP) fusion provides anterolateral access to the lumbar spine, allowing for safe anterior lumbar interbody fusions with significant manipulation and correction of spine deformity. To date, there is limited literature on the effectiveness of the MIS-ATP approach on shoulder-level correction for adult scoliosis patients. The purpose of this study is to evaluate shoulder level changes in adult patients following spine deformity correction via the MIS-ATP approach.

Methodology
This is a retrospective cohort study of adult patients who underwent minimally invasive antepsoas (MIS-ATP) fusions for scoliosis in our university surgical center. Patients who had surgeries between January 2008 and February 2023 and have both pre and post-operative (at least six months) scoliosis studies were reviewed. Shoulder correction was measured via shoulder height changes and clavicle angle changes.

Result
A total of 58 patients (mean age 27.6, 51.6 male) were included. The average pre-op shoulder height was 12.48mm, with a clavicle angle of 2.65 degrees. There was a significant change in the post-op shoulder levels, with average shoulder height of 7.59 mm and clavicle angle of 1.71 degrees (t-test, p < .005). 74.1% of patients demonstrated correction in post-op shoulder level. 6.9% of cases had worsening shoulder imbalance on the same side (> 5mm), while 6.9% of patients had overcorrection, leading to a worse imbalance in the opposite direction (> 5mm).

Conclusion
A significant correction in shoulder level was found for adult patients who had scoliosis correction via MIS-ATP fusion. The MIS-ATP approach could potentially provide an effective solution for scoliosis correction procedures that lead to shoulder-level balance.
DIGITAL POSTER ABSTRACT

Mr. Abdulrahman Fahad Alesawi, Consultant Ramy Samargandi, Louis-Romée Le Nail, Osamah Abualross, Abdulrahman Alesawi.

Introduction
Spinal ependymomas are rare primary central nervous system tumors that often exhibit vague symptoms before being identified. In extremely rare situations, it can be identified after a neurological decline following a history of spinal anesthesia, indicating intraspinal hemorrhages from an incidental lumbar ependymoma that was not previously diagnosed. Spinal anesthesia is widely utilized in numerous orthopedic surgical procedures, as it is a well-tolerated invasive procedure with a low risk of complications.

Methodology
The patient in this case study underwent elective orthopedic surgery under general anesthesia following two unsuccessful trials with spinal anesthesia. Subsequently, the patient developed paraplegia as a result of an incidental hemorrhagic spinal ependymoma.

Result
A 44-year-old patient underwent a curettage biopsy of a cartilaginous lesion in the right proximal tibia. The procedure was performed successfully under general anesthesia after two failed attempts at spinal anesthesia. Five days after the surgery, the patient developed lower back pain and lower limb weakness. An MRI revealed a possible post-spinal anesthesia hematoma, and emergency neurosurgery was performed to decompress the dural sheath and evacuate the hematoma. A soft tissue mass was discovered and identified as an ependymoma. The patient partially recovered lower limb function postoperatively, and physiotherapy was initiated. A follow-up MRI confirmed decompression of the cauda equina and the complete disappearance of a second lesion that was originally identified at the level of the dural sac, which was likely a hemorrhagic lesion that had resolved over time.

Conclusion
Although such incidences are deemed to be rare, this case demonstrates the importance of vigilance when it comes to postoperative neurological manifestations concerning invasive spinal procedures. While patients from this and the abovementioned reports showed favorable improvement with subsequent treatment even with what’s considered a later presentation, it is still advisable to act as quickly as possible with these cases to ensure the best possible result. Efforts to educate patients to seek faster care could help in reaching better outcomes.


Mr. Mohamed Awad Mohamed Hassan.

Introduction
Occipital condyle fractures (OCFs) are basilar skull fractures that can indicate the presence of craniocervical dissociation. The incidence of OCFs has been estimated to be between %1 and %3 of blunt craniocervical trauma, and their treatment remain controversial, and almost always occur unilaterally. Bilateral OCFs are infrequently recognized due to non-specific clinical manifestations and inadequate visualization on conventional radiographs of the skull and cervical spine without computed tomography (CT) of the head and neck. Several classification systems has been proposed for OCFs depending on the fracture morphology (Anderson and Montesano) and presence of ligamentous injury (Tuli et al), a more recent classification system postulated by Mueller et al which included Atlantooccipital dislocation, craniocervical misalignment and neural element compression in his classification system. Simultaneous OCFs and a retro-clival subdural hematoma can occur due to injury to osseous structures at the craniocervical junction.
[2]". Given the possibility of the co-existence of these injuries, we believe that patients with non-displaced bilateral OCFs should be evaluated for a retro-clival subdural hematoma.

**Methodology**

Extensive literature review conducted using PubMed and Google scholar search with the key words “occipital condyle fracture” and “retroclival subdural hematoma and “atlantooccipital dislocation”.

**Result**

The patient was followed closely and recovered uneventfully without the need for surgical intervention.

**Conclusion**

Fracture pattern, the integrity of ligamentous structures and alignment are the main factors that govern the decision between surgical and non-surgical treatment. Presence of rcSDH in the setting of stable bilateral OCFs, we recommend the Mueller et al classification to direct care and management planning. The co-incidence of rcSDH and non-displaced bilateral OCFs indicates a severe injury, but does not necessarily indicate instability as in our case and can allow for conservative management.

---

**Abstract 2614:** Chiari Type One Malformation, Clinical Features and Surgical Outcome Assessment Using Chicago Chiari Outcome Score (CCOS) Among Sudanese Patients. M. D. Mohammed Awad Elzain.

**Introduction**

Chiari malformation is one of the most controversial topic in neurosurgery today. There is no of agreement as to what define these malformations, their symptoms and their natural history. Chicago Chiari Outcome Score (CCOS) is a scoring system designed to study the surgical outcome of Chiari type 1 patients.

**Methodology**

This study was a prospective observational study done at different neurosurgery centers in Khartoum during the period from February -2018 August 2019. The study included all Sudanese patients who underwent decompression surgery for Chiari 1- malformation with or without duraplasty during this period. Chicago Chiari Outcome Score (CCOS) was applied to evaluate post surgical outcome.

**Result**

Twenty patients were found to satisfy inclusive and exclusive criteria for Chiari I malformation and were all operated (11 males and 9 females). The mean age was 33 years. The mean duration of symptoms was 19.8 months. Associated syringomyelia was detected in (n=90 ,18). All patients underwent posterior fossa decompression with or without removal of the posterior arch of C1, and with or without duraplasty. Mean time for follow up was 4.45 months. Using the scoring system of CCOS, The outcome of the study group revealed incapacitated outcome (n=15 ,3), impaired outcome (n=6,30), functional outcome (n=9,45) and excellent outcome (n=2,10). Patients without associated syringomyelia showed better outcome in comparison to patients with associated syringomyelia which was statistically significant (P = 0.008).

**Conclusion**

This study provides evidence that early surgical intervention for Chiari 1 malformation before the development of delayed severe symptoms of the disease was associated with better outcome especially in those without associated syringomyelia.

**Abstract 2622** Classification of Thoracic Spine Fractures: The Four Column Theory.

**Assist. Prof. Dakheel Abdullah Aldakheel.**

**Introduction**

Thoracic spine fractures have been overlooked in the literature, and the surgical indications are still unclear. In the last century, spine fracture classifications have evolved. It is safe to say that no classification has been developed to accommodate the anatomical and biomechanical
characteristics of the thoracic spine. The rib cage is a distinctive feature and has been advocated as the fourth column of the thoracic spine. Several studies have indicated its importance to thoracic spine stability. In addition, others discussed the importance of the posterior column in ensuring the stability of the thoracic spine. Therefore, a classification that embraces recent evidence will contribute significantly to the existing literature gap. The purpose of this paper is to present a classification of thoracic spine features that is based on both anatomical and biomechanical characteristics.

Methodology
A mechanistic concept is incorporated into the classification, which considers both movements and the application of forces, leading to pathomorphological characteristics. A hierarchical ranking determines the severity of fractures within the thoracic spine, and treatment recommendations are presented in each category. The fourth column of the spine is incorporated into the classification through direct and indirect mechanisms.

Result
The classification is based on the relationship between movement and common forces. The primary deforming factor is movement, whereas common forces, which include compression, distraction, and torsion forces, are considered the main categories. Type A injuries occur due to axial compression, which commonly affects one or two vertebral columns. Type A compression injury is furtherly divided based on movement, which will determine where and how the vertebral columns are affected. Type B represents a dynamic relationship between the primarily tensile force acting posteriorly and a simultaneous secondary compression force acting on the anterior vertebral column. Type C result from torsional injury acting axially either in flexion or extension. The hierarchy arrangement within the subcategories is devised to reflect ongoing events of force and movement.

Conclusion
The proposed classification accommodates several advantages, such as simplicity and practicality, that make this classification helpful in daily practice. The dynamic relationship between movement and force provides a better understanding of the fracture mechanism. Finally, incorporating the fourth column will strengthen the indication for surgical management. To the best of our knowledge, this classification is the first classification developed uniquely for the thoracic spine fractures and will help to address a critical gap in the literature.

Abstract 2629: Effectiveness of Therapeutic Exercises for Lumbar Disc Herniation in an Athlete

Introduction
Lumbar Disc Herniation LDH affects athletes more than the majority of the general population worldwide. The standard management of lumbar disc herniation is a conservative treatment including non-steroid anti-inflammatory drugs and physical therapy however if conservative management fails to improve patient manifestations, surgery is recommended.

Methodology
The goal of this study was to emphasize that, whether the therapeutic exercise intervention for an athlete patient with a lumbar disc herniation complaining of Low Back Pain (LBP) radiating to the lower limb would be effective in return to sports activities. 24 sessions in 8 weeks, divided into 4 intensity-increasing phases. In the first phase, the goal was to reduce pain, through gentle stretching, and Range of Motion ROM exercises. The exercises increased in intensity gradually throughout each phase. The last phase’s goal was to allow the patient to return safely and effectively to the sport, this phase continued with the same given program before in addition to sport-specific exercises.

Result
The patient’s initial visual analogue scale was 10/8 and Lower Extremity Functional Index 80/18.
In the last session of the treatment program patient scored by the Visual Analogue Scale VAS 10/2, and lower extremity function index LEFI 80/72. The patient was able to carry out the functional activity in a free pain Range of Motion ROM with appropriate posture and he was capable to return to his usual sports activities. This report describes the treatment program of an athlete patient with Lumbar Disc Herniation that resulted in decreased pain, improve motor function, and the ability to return to sport.

Conclusion
The therapeutic exercise intervention for an athlete patient with a lumbar disc herniation complaining of Low Back Pain (LBP) radiating to the lower limb would be effective in return to sports activities.


Doctors Sahar Salah Aldakhil.

Introduction
Lumbar spine fusion is the mainstay treatment for degenerative spine disease. Multiple potential complications of spinal fusion have been found. Acute contralateral radiculopathy postoperatively has been reported in previous literature, with unclear underlying pathology. Few articles reported the incidence of contralateral iatrogenic foraminal stenosis after lumbar fusion surgery. The aim of current article is to explore the possible causes and prevention of this complication.

Methodology
The authors present 4 cases in which patients developed acute postoperative contralateral radiculopathy requiring revision surgery. In addition, we present a fourth case in which preventive measures have been applied. The aim of this article was to explore the possible causes and prevention to this complication.

Result
Different pain measures: Neck reflex point scale (NPRS), visual analogue scale (VAS) and facial pain scale (FBS) were utilized to assess the efficacy of the treatment with a various time of follow-up among the studies. The result shown a decrease on the pain outcome measures after the thoracic spine thrust manipulation (TSTM) intervention. Additionally, there was a significant improvement in the neck range of motion (ROM) immediately after TSTM and up to 6 months follow up. This result illustrates the positive effect of the TSTM on mechanical neck pain.

Conclusion
Cervical Thrust Manipulation is contraindicated for treating individuals with mechanical neck pain and TSTM is advised. Although, practitioners should exercise caution while using this approach on patients.


Mr. Sultan Abdullah Alzubeidi, Mr. Abdullrahman Alfawaz.

Introduction
Neck pain is a widespread musculoskeletal condition and very common reason for health care visits. This pain usually results from problems with the musculoskeletal system e.g. spine vertebrae, ligaments and tendons.

Methodology
Online research through the electronic databases, such as Ovid, Medline, CINHAL, Google Scholar, Cochrane library, Pedro database and Pubmed was conducted. Citation searches within studies, as well as online tracking of references were also conducted in this review.

Result
Conclusion: Iatrogenic foraminal stenosis of the lumbar spine is a common complication; preoperative evaluation and middle intervertebral cage positioning are needed to prevent this complication.

Professor Tarek Ahmed Mohamed Aly.

Introduction
The best management for degenerative spondylolisthesis patients is still controversial. Low-grade spondylolisthesis without neurologic deficits used to be treated non-surgically as a first-line. Many studies stated that in patients with degenerative spondylolisthesis with or without spinal stenosis, surgery had superior outcomes. The aim of this systematic review was to describe the effectiveness of surgery versus conservative treatment for lumbar degenerative spondylolisthesis.

Methodology
A comprehensive literature search was performed for relevant studies in Medline, EMBASE, CINAHL, Scopus, Centre for Review and Dissemination databases and Cochrane databases were searched. The search included English studies, and all conservative and surgical interventions were included.

Result
Two studies met the inclusion criteria. The number of patients was 355) 650 treated with surgical intervention and 295 treated conservatively). Surgery was found to be more effective than conservative care in the two studies.

Conclusion: Patients with lumbar degenerative spondylolisthesis treated with surgery had significantly better results in pain and function compared with patients treated with nonoperative treatment.

Abstract 2647: The Prevalence Of Musculoskeletal Pain (Msp) Among Orthopedic Surgeons And Residents In Saudi Arabia›s Eastern Area.

Others Hajer Eid AlSaif, Others Hajar Eid Alsaif, Mohammad Hasan Alatiyah

Introduction
Introduction Orthopedic surgeons work in a dangerous field that has infections, radiation, smoking, toxins, excessive noise, musculoskeletal injuries, as well as emotional and psychological problems which are all risks that orthopedists are more likely to experience [1]. It is logical to put the emphasis on patients' health but it is easy to overlook the healthcare providers' well being [2]. The practice of orthopedic surgery requires a lot of stamina for long hours of the week [3]. The areas that were mostly reported for musculoskeletal pain by orthopedic surgeons were the neck, lower back, shoulder, and elbow [4]. Among the risk factors for musculoskeletal pain (MSP) is the awkward posture that surgeons tend to hold while operating [5]. The use of loupe magnification and headlight are also reported to cause MSP [6]. Increased age and the number of cases held by the surgeon are also aggravating factors for MSP [7-2]. Even though orthopedic surgery residents do not operate as much as their seniors, they still provide support during these operations which mostly involve tasks that are tiring such as holding extremities for prolonged periods of time [8]. A study mentioned that orthopedic surgery residents encounter the same amount of pain that practicing surgeons experience [9]. The difficulties and injuries that surgeons face can have a profound negative impact physically, mentally, and financially [7-2]. There is a small number of papers that are published regarding the topic of musculoskeletal disorders among orthopedic surgery practitioners and residents [9]. The aim of this study is to quantify the prevalence of MSPs among practicing orthopedic surgery physicians and residents in the eastern province of Saudi Arabia.

Methodology
Methods: A cross-sectional study was conducted in the Eastern region of Saudi Arabia. A simple random selection of 103 male and female orthopedic surgery residents from Saudi Commission for Health Specialties accredited hospitals was enrolled in the study. Residents enrolled from the first to fifth year.
Data were collected using a self-administered online questionnaire based on the musculoskeletal Nordic questionnaire activated in 2023-2022.

**Result**
Out of 103, a total of 83 completed the survey. The majority (%49.9) were junior residents from residency year (R) -1R3 and exactly %62.7) 52) residents were males. The majority of the participants, which were 35 physicians (%55.6), performed less than six operations as average operations per week, and duration stay in the operating room (OR) per operation there were 29 physicians (%46) stay in the OR for 6-3 h. The most reported sites of pain included lower back pain (%46), followed by neck pain (%39.7) and then upper back pain (%30.2). About %27 of the participants had the pain for more than 6 months, however, only %11.1) 7) residents seek for medical help. Considering the associated factors with MSP, smoking, and residency year were significantly associated with having musculoskeletal pain (MSP). The presence of MSK pain among R1 residents represents %89.5, in comparison with R2 residents Who reported %63.6 and %66.7 among R5 residents. This finding indicates a decrease in MSP among residents over the 5 years of residency programs. Additionally, the majority of the participants with MSP reported being smokers 24 %88.9)), controversy, only three of the participants represent (%11.1) without MSP and smokers.

**Conclusion**
Musculoskeletal pain is a serious issue that needs to be addressed. The results indicate that the most reported areas of MSP were the low back, neck, and upper back. Only a minority of the participants went to seek medical help. Residents from R1 experienced more MSP than their seniors and this could indicate an adaptive behavior from senior staff. More research should be done on the topic of MSP in order to promote health among caregivers across the kingdom.

**Abstract 2651:** Anterior Cervical Huge Osteophyte Causing Dysphagia: A Case Report

M. D. Amin Ghazi Gronfula.

**Introduction**
Elderly groups are more predisposed to have degenerative changes in the cervical spine, with a %75 or greater prevalence among people aged 65 or older with variable types of changes. Twenty percent to %30 of the elderly population was found to have an anterior cervical osteophyte. An anterior cervical osteophyte is usually found incidentally, as it is asymptomatic, but in rare cases, patients present with dyspnea, dysphonia, and dysphagia with a direct connection between hypertrophic spurs size and symptoms. Osteophytes can be caused by trauma, diffuse idiopathic skeletal hyperostosis, ankylosing spondylitis, and degenerative changes [3-1]. Here, we present the case of an 83-year-old man presenting with dysphagia as a result of a large anterior osteophyte post-trauma, with a resolution of his symptoms following cervical osteophytectomy.

**Methodology**
An 83-year-old male, a known case of hypothyroidism and hypertension, came to the emergency department after falling and landing on his face. He presented with quadriaparesis and severe dysphagia after the incident of falling. On examination, the patient was quadriplegic and wheelchair-bound; hyperreflexia was noticed on all limbs, and the Hoffman sign was positive. Regarding his dysphagia, he was not able to tolerate both liquid and solid diets. A computed tomography (CT) of the cervical spine showed a large anterior osteophyte spanning C-3C4. There was a suspicious-looking horizontal line at the superior aspect of the C5 vertebra. There was preserved vertebral height and shape of the rest of the vertebral bodies, with no evidence of subluxation. Diffuse degenerative changes are noted. Ossification of the posterior longitudinal ligament was noted at the C4 and C5 levels, causing the narrowing of the spinal canal. Calcification of the anterior longitudinal ligament was noted. A large anterior osteophyte was observed at C-3C4. CT showed disc herniation (Figure 1). MRI cervical spine sagittal view T2 showed C4-3 cervical disc collapse compressing the spinal cord at C4-3 (Figure 2).
The anterior osteophyte was removed, followed by an anterior cervical discectomy and fusion, with the previous CT showing posterior ligament ossification. Postoperative X-ray showed the removal of osteophytes with fixation of the cervical spine (Figures 4-3). The patient underwent surgery in a supine position, and pethidine preparation and anesthesia were done. The skin incision was guided by the superior capsular reconstruction (SCR) technique, identifying the C-3C4 level. The surgery started by opening the platysma, dissecting medially to the sternocleidomastoid muscle, and going down to the cervical spine. Identification of longus oculi and muscle stripping of longus oculi. Application of the Claud retractor and cuspal retractor and removal of the anterior osteophyte was done. Introduction of the microscope and then discectomy was done under microscope guidance and peek cage and screws were inserted for fusion. Closure of the platysma and skin was done, and the patient followed up with an MRI, physiotherapy, and rehabilitation.

**Result**

Osteophytes can occur anywhere along the spine, but when they develop in the cervical area, they are usually asymptomatic. However, they can cause severe complications such as dysphagia. It was found by a study in the veteran population that 10.6% of patients who were evaluated for dysphagia had an anterior cervical osteophyte [4]. This might suggest that we could consider performing a CT scan for all patients with dysphagia after excluding all other common causes. Patients suffering from dysphagia should undergo many investigations, such as manometry and a barium swallow test, to exclude common causes. An MRI is usually done for patients who have severe symptoms accompanied by dyspnea and dysphonia. MRI is done in patients diagnosed with anterior cervical osteophyte with severe symptoms pre-operatively to evaluate any stenosis that could be repaired at the time of surgery. Observation and conservative treatment are the primary treatments for patients with dysphagia caused by a cervical osteophyte. A speech and language therapist would participate in the management to encourage swallowing exercises. Dietary modification and non-steroidal anti-inflammatory drugs are also used. Surgery would be the second option after the failure of conservative treatment [5]. Surgery is the mainstay of treatment in most cases, according to some surgeons. They believe cervical osteophytectomy should be considered in all cases of dysphagia caused by a cervical osteophyte to prevent progression to acute respiratory distress. Maiuri et al. supported this belief by submitting a case report of a patient who suffered from sudden respiratory distress requiring emergency tracheostomy in the background of chronic dysphagia caused by cervical osteophyte [6]. There are a couple of operative techniques, with resection of the osteophyte with or without spinal fusion being the most popular [7]. Osteophyte recurrence is not uncommon in osteophytectomy without spinal fusion, although it is considered to have a shorter operation time and causes fewer complications after the surgery [8].

**Conclusion**

Physicians dealing with dysphagia of unknown cause among elderly patients should always suspect an anterior cervical osteophyte. A radiographic investigation along with a barium swallow test should be conducted on all patients with suspicion of an anterior cervical osteophyte to confirm the diagnosis. Osteophysectomy is believed to be an adequate treatment for patients who fail conservative treatment to improve their quality of life and prevent severe complications such as respiratory distress.

---


Professor Ahmad Najib Ashraf, Professor Gen Khalf Radan Almoutary.

**Introduction**

Radiosurgery was started in Saudi in Aug 1991 in PSMMC and it was the first center of South Asia to Start Radiosurgery.
Methodology
Radiosurgery was done for spinal metastasis, Avm, Meningioma, A neuroma and other disorders and presented in AANS, ISRS and WFFNS Meeting.

Result
Spine Radiosurgery is very successful in complex AVM, Metastatic spread and where surgical procedure are not beneficial for spinal cord tracts involving and need tracking by tractographic targeting in radiosurgery.

Conclusion
Spine Radiosurgery is very safe option for radiosensitive lesions of cord and other benign lesions. We recommend radiosurg for complex spinal lesions. We present results of spine radiosurgery.

---

Abstract 2657: Lumber Disc Herniation - An Unusual Aetiology of Acute Painless Synchronous Foot Drop.

Mr. Mohamed Awad Mohamed Hassan, Professor Saggaf Alawi Assaggaf, M. D. Abdulhafeez Osman Eltoum Mohamed, M. D. Salah Hani Hani Sharif.

Introduction
Bilateral foot drop (FD) is a manifestation of pathological conditions with various aetiologies ranging from systemic to local. It is defined as partial or complete foot and ankle dorsiflexion weakness. FD is caused by weakness of the tibialis anterior muscle, which is the primary dorsiflexor of the ankle joint that is controlled by the fibular nerve [1]. Previous studies have shown FD lesions occurring at the L5/4 level [2]. However, several electromyography studies have revealed that few nerve fibres from the L2, L3, S1 and S2 nerve roots supply the anterior tibialis muscle [3]. FD is caused by motor neuron pathologies in the lumbar spine or common peroneal nerve injury [4]. L5, L4, and S1 nerve root compression is commonly implicated in degenerative lumbar spine diseases causing FD [5]. Pain is the most significant symptom in patients with lumbar nerve root compression caused by degenerative diseases. Therefore, the cause of acute painless bilateral FD should be explained to the patient. In such a case, conservative treatment can lead to adhesion of the extruded nucleus pulposus to the dura and further development of arachnoiditis [6]. Hence, the whole disc material extrudes, percutaneous endoscopic disc removal or microdiscectomy, which is a less invasive procedure with few complications and has a short duration is preferred.

Methodology
A systematic review was conducted using PubMed and google scholar. Demographic and radiological data were obtained from a painless acute bilateral foot drop presented to our neurosurgery unit. We reviewed the patient demographics, clinical presentation, radiological parameters, surgical parameters, and time from presentation to surgery. In addition, preoperative, early postoperative, and most recent follow-up neurological examinations were compared.

Result
Our patient improved gradually after the surgery, on the first postoperative day, we obtained an MMT (Manual Muscle Test) Scoring < 3 on admission, and third day postoperative MMT Scoring of 3. After six weeks, the last follow-up had an MMT Score of 5 for both ankles.

Conclusion
Acute bilateral painless FD alone is a red flag sign for both intracranial and spinal pathology need prompt diagnoses and acute treatment. In the setting of lumbar discopathy, conservative management and delayed surgery can lead to decreased probability of improvement and poor prognosis. Therefore, early decompressive surgery in the first 24 h is crucial to excellent recovery.

---


Introduction
Background: Musculoskeletal disorders are one of the most common health issues often managed at the level of primary health care, putting a significant load on primary care physicians (PCPs). Enabling physical therapists to be first-contact practitioner for patients with musculoskeletal disorders could improve patient access, expedite management, enhance outcomes and reduce costs. However, this role requires a high level of musculoskeletal knowledge and the ability to detect red flags. To date, no study has assessed or compared these skills between physical therapists and PCPs in Saudi Arabia.

Methodology
A cross-sectional study was undertaken using an electronic survey comprising 16 case scenarios for musculoskeletal disorders. The survey assessed participants’ knowledge and ability to identify red flags. Study participants included physical therapist and PCPs practicing at Ministry of Health hospitals and/or primary care centers in Riyadh, Saudi Arabia and were involved in the management of adults with musculoskeletal conditions and disorders.

Result
A total of 60 physical therapists and 76 PCPs (43 family medicine physicians, 33 general practitioners) participated. Good knowledge levels (total score ≥ %75) were found for %7 of physical therapists compared to %18 of PCPs, and moderate knowledge levels (total score %75-60) for %70 of physical therapists compared to %62 of PCP participants (P=.003).

Conclusion
Physical therapists and PCPs in Saudi Arabia demonstrated an overall moderate level of musculoskeletal knowledge and the ability to identify red flags. The results suggest that with further education on red flags identification, physical therapists in Saudi Arabia could potentially act as first-contact practitioners for patients with musculoskeletal conditions and disorders.

Abstract 2661: Overcoming Scoliosis: A Journey from Surgery to Medical School.

Ms. Reem Ibrahim Jbara.

Introduction
Scoliosis, a multifaceted complex spinal condition affecting countless young individuals, often demands tiring interventions to restore both physical and mental well-being. This abstract aims to narrate the experience and personal journey of a survivor who underwent successful corrective surgery for scoliosis, and fully recovered. This narrative aims to highlight the significance of comprehensive care for scoliosis patients, emphasizing the potential for complete healing and personal growth, and shine the light on a possible comprehensive Care for Spine Health.

Methodology
The presentation draws from a firsthand experience, detailing the preoperative assessment, surgical procedure, and the postoperative rehabilitation process. The narrative also explores the importance of mental resilience during the recovery period.

Result
The patient’s transformation is showcased, from an individual weighed by scoliosis to a thriving medical school student. Emphasis is placed on the role of multidisciplinary care, psychological support, and patient-doctor collaboration in achieving recovery. This narrative serves as a call for change, encouraging medical professionals to adopt a comprehensive and holistic approach in treating scoliosis patients. By sharing the journey, the presenter, hope to underscores the potential for full recovery when whole well-being are addressed correctly.

Conclusion
The presentation aims to inspire a paradigm shift in medical practice, urging practitioners to prioritize patients’ emotional and physical health. By shedding light on the transformative power of comprehensive care, the speaker aims to pave the way for improve treatment strategies and enhanced patient outcomes in the realm of
spine health.

---

**Abstract 2666:** Uniportal Vats Hybrid Approach for Posterior Mediastinal Dumbbell Tumors (Throught Posterior Spinal Approach).

Professor Ali Ahmed Abdelaleem, Professor Ali Ahmed Abdelaleem, Hussein Elkhayat.

**Introduction**

Complete surgical resection is the mainstay of the management of posterior mediastinal neurogenic tumors (PMNT)(benign or malignant), and it offers excellent survival outcomes in most cases. Dumb-bell tumours occur in less than 10% of all PMNT, but they constitute a surgical challenge because they need a combined approach for the intraspinal extension and the intrathoracic part either as a staged or as a single-stage approach. Until recently, a classic posterolateral thoracotomy was the gold standard for surgical resection of dumb-bell PMNT. To avoid having to make two large incisions, different approaches were used to improve pain and cosmesis. In cases with associated scoliosis, one can perform scoliosis surgery to fix the angle of the thoracic vertebra, and the posterior incision is large enough to accommodate a thoracotomy incision without a separate skin incision. If the tumour has an extrathoracic extension, a thoracotomy incision can be tailored laterally from the posterior incision in a T or inverted Y fashion.

**Methodology**

We conduct a retrospective study enrolling all patients with dumb-bell tumor operated in our center as a single stage combined approach within the last 5 years.

**Result**

During the study time frame we operate upon 9 patients with dumb-bell tumors. The main pathology was gangulioneuroma. One patients had scoliosis correction with tumor removal. Three patients had inverted Y incision for a single stage resection and five patients were operated using hybrid approach via thoracoscopic approach for the intrathoracic part of the tumor.

**Conclusion**

VATS offers improved surgical outcomes in terms of enhanced recovery, less postoperative pain, decreased analgesic demands, fewer complications and shorter hospital stays. Proper selection of cases for uniportal thoracoscopic hybrid excision is crucial for ensuring good surgical outcomes.

---

**Abstract 2668:** A Systemic Review of Spinal Needles Broken During Neuraxial Anesthesia.

M. D. Thamer Hamad Alsharif, M. D. Amin G Gronfula, M. D. Shifaa Turkistani, M. D. Abdulkarim Alshamlany, M. D. Zika Sharourou, M. D. Hesham Abouelenein.

**Introduction**

Numerous surgical procedures, particularly those in obstetrics, gynecology, and orthopedics, frequently involve spinal anesthesia. Although problems including post-dural puncture headache, nerve injuries, and epidural hematoma can happen. The breakage of a spinal needle within the patient’s intrathecal space is one of the less common but potentially serious complications of spinal anesthesia. Unfavorable outcomes from a broken spinal needle may include pain and infection. As a result, it is critical to determine the risk factors for needle breakage during spinal anesthesia and to develop preventative measures.

**Methodology**

An electronic search of the literature was identified using the search strategy of 48 articles (19 Embase, 16 Web of Science, and 13 PubMed), in addition to 15 articles added through a manual web search. There were 20 duplicates among the 63 studies. The titles and abstracts of the remaining 43 articles were screened, and 28 articles were examined for full-text screening. In the final analysis, we included 22 screening.

**Result**

Difficulties in finding and palpating anatomical
landmarks were associated with a higher risk of needle fracture. This was more frequently demonstrated in patients with increased body habitus, such as parturients and patients with obesity (BMI > 30). Small gauge needles are frequently used in spinal anesthesia due to their advantage in reducing post-dural headache, which is one of the commonest complications of spinal anesthesia.

**Conclusion**
The breaking of a SA needle is a severe and rare incident of multifactorial causes. Our aim in this systematic review is to assess the incidence, risk factors, and preventative measures for this to improve patient safety and outcomes. The findings provide insights into the symptoms associated with different diagnoses and how difficult anatomical landmarks can lead to a higher risk of needle fracture. In addition, we focused on multiple risk factors, including high MBI and small gauge needles. However, more studies are needed to properly assess this correlation’s mechanism and investigate further risk factors.

**Abstract 2669:** Successful Management of a Broken Spinal Needle During Difficult Spinal Anesthesia: A Case Report.

M. D. Thamer Hamad Alsharif, M. D. Abdulkarim Alanazi, M. D. Ahmed Deif, M. D. Hesham Aboueleneein

**Introduction**
Spinal anesthesia was the first regional anesthetic technique used, and August Bier performed the first operation under spinal anesthesia in 1898 in Germany. Before this, the only existing methods of local anesthesia were infiltration anesthesia and topical anesthesia for the eyes.

**Methodology**
A 23-year-old primigravida, 38 weeks pregnant, presented to the ER with high blood pressure measured at 80/150 at home, associated with severe headache, no visual disturbance, and epigastric pain. Her initial blood reading was 72/148, and the follow-up reading was 90/146. Fundal height was 40+, and CTG was reactive. On examination, she was conscious and alert, GCS 15/15, no lower limb swelling, and cervical OS closed. The urine dipstick was positive for 3+ protein. She was admitted for pre-eclampsia, and informed consent was taken for an emergency Caesarean section. The patient was informed of the risks and benefits of receiving spinal anesthesia as well as what to expect throughout the procedure.

**Result**
To get the needle out, the exact location of the needle is identified intraoperatively using fluoroscopic guidance in the AP and lateral views. A paramedian incision was made, and muscle division was performed until the posterior end of the needle was visible and extracted. The closure was performed using 6.0 sutures and Dural after fluoroscopic confirmation of the removal of the needle and recording the absence of any fragments. After the procedure, she was permitted to walk. The patient has surgical site pain, which has responded well to medications. She had no neurological impairment and was doing well. The wound was clear and dry, with no leaks when changing the dressing. She was discharged from the hospital, and the sutures were removed 12 days later. She resumed her normal activities without experiencing any side effects.

**Conclusion**
Spinal anesthesia may be a straightforward procedure, but like all surgical procedures, it is not without danger and may occasionally present difficult consequences. One of them could be a broken needle while administering. The published studies state that a broken needle during administration is a relatively uncommon complication. In conclusion, surgical intervention to remove broken or lost needles is the preferred option, as it is effective and has a very reassuring outcome.

Doctors Abdullah Alhawah Alrashidi, Assist. Prof. Tom E. Nightingale, Assist. Prof. Katharine D. Currie, Assist. Prof. Michele Hubli, Professor Maureen J. MacDonald, Assoc. Prof. Audrey L. Hicks, Paul Oh, Beverley Catharine Ceraven, Professor Andrei V. Krassioukov.

Introduction
Arterial stiffness, as measured by carotid-femoral pulse wave velocity (cfPWV), is elevated after spinal cord injury (SCI). In the uninjured population, exercise training has been shown to reduce arterial stiffness.

Methodology
In a randomized, clinical multicenter trial, we evaluated the impact of two exercise interventions on cardiovascular disease risk factors in individuals with chronic SCI. A total of forty-six adults with motor-complete SCI with neurological levels of injury between the fourth cervical and sixth thoracic spinal cord segments were randomly assigned to either body weight-supported treadmill training (BWSTT) or arm-cycle ergometer training (ACET). Participants trained 3 days per week for 24 weeks. Exercise session duration progressed gradually to reach 30 and 60 minutes for ACET and BWSTT, respectively. The primary outcome was arterial stiffness, measured by cfPWV, and was measured at baseline, 12 weeks of training and at 24 weeks. Secondary outcomes included cardiorespiratory fitness (CRF) and cardiometabolic health measures and were measured before and after completion of training.

Result
Fourteen participants per intervention arm completed the exercise intervention. Our results show no effect of either exercise intervention on arterial stiffness (P = .07) and cardiometabolic health measures (P > .36). However, peak oxygen uptake, a measure of CRF, increased with ACET compared with BWSTT (P = .04).

Conclusion
The findings of this trial demonstrate that while 24 weeks of upper-body exercise improved CRF in individuals with motor-complete SCI ≥ T6, neither intervention was associated with improvements in arterial stiffness or cardiometabolic health measures.


Introduction
To review the evidence regarding the most common practices adopted with cardiopulmonary exercise testing (CPET) in individuals with spinal cord injury (SCI), with the following specific aims to: (1) determine the most common averaging strategies of peak oxygen uptake (VO₂peak), (2) review the endpoint criteria adopted to determine a valid VO₂peak, and (3) investigate the effect of averaging strategies on VO₂peak values in a convenience sample of individuals with SCI.

Methodology
Searches for this scoping review were conducted in MEDLINE (PubMed), EMBASE and Web Science. Studies were included if (1) were original research on human published in English, (2) recruited adults with traumatic and non-traumatic SCI, and (3) VO₂peak reported and measured directly during maximal CPET. Full-text review identified studies published before April, 2021 for inclusion. Extracted data included authors, journal name, publication year, participants characteristics, and comprehensive information relevant to CPET.

Result
The extracted data from 199 included studies were presented descriptively. We found that more than 50% of studies adopted a 30sec averaging strategy.
A wide range of endpoint criteria were used to confirm the attainment of maximal effort. In the convenience sample of individuals with SCI (n=30), the mean VO₂peak decreased as epoch lengths increased. Reported VO₂peak values differed significantly (P<.001) between averaging strategies, with epoch length explaining 56% of the variability.

Conclusion
The adoption of accepted and standardized methods for processing and analyzing CPET data is needed to ensure high-quality, reproducible research and inform population-specific normative values in individuals with SCI.

Abstract 2674: Utilization of Percutaneous Vertebroplasty and Endovascular Embolization In The Management of Aggressive Atypical Vertebral Hemangioma, A Case-Series.

M. D. Mohammad Abdullah Almalki, Specialist Nabil Mohammad Ozair, Abdulrahman Hamoud Almalki.

Introduction
Vertebral hemangioma (VH) is the most prevalent primary tumor of the spine, with an incidence of 27.1% in the general population. Mostly benign and asymptomatic, this tumor is the result of vascular proliferation of capillaries and venous structures. These lesions are usually found incidentally on CT or MRI. However, atypical vertebral hemangioma, which accounts for around 1% of all VH exhibit extraosseous extension, compressing the spinal cord.

Methodology
Case series.

Result
We report four cases of atypical VH. Three cases, 59 years old female, 13 years old male, and 54 years old male, presented with back pain, varying in location and severity, fourth case, a 37 years old female, presented lower limb weakness, fever and skin rash, regions affected were lumbar and thoracic spine, respectively. Patients were managed with either alcohol injection and vertebroplasty or endovascular embolization. Upon follow up, patients showed improvement in terms of pain and function, with no recurrence reported.

Conclusion
Vertebral hemangioma is a relatively common incidental radiological finding, the clinical presentation as well as the radiological findings of our presented cases, are consistent with aggressive atypical hemangioma, requiring an expert spine surgeon as well as an interventional radiologist to achieve optimal clinical outcome.

Abstract 2675: Assessment of Osteoporosis Knowledge and Awareness Among Saudi Population Using the Osteoporosis Knowledge Assessment Tool.

M. D. Mohammad Abdullah Almalki, Resident Abdulrahman Hamoud Almalki, Hanan Helmi Almahdi.

Introduction
Osteoporosis is a skeletal disorder that is characterized by low bone mass, micro-architectural disruption, and skeletal fragility, resulting in an increased risk of fracture. Osteoporosis imposes a great threat to public health as it is a major cause for fractures that are associated with high morbidity and mortality, such as hip and vertebral fractures. It is considered a preventable disease, thus in this study, we are aiming to assess the knowledge of the individuals to be able to address the insufficient awareness among the society.

Methodology
This is a quantitative, descriptive cross-sectional study that was conducted in the capital city of Riyadh, Saudi Arabia. Arabic self-reported questionnaire was used consisted of sociodemographic questions and the Osteoporosis Knowledge Assessment Tool.
Result
With a sample of 451, only %15.2 of the participants were aware about osteoporosis. A total of %42.8 believed that it is easy to judge if you were at risk of developing osteoporosis from signs and symptoms and only %9.3 of participants know that osteoporosis does not usually cause symptoms such as pain before fractures. Major lack and inadequacy were found among our sample regarding the knowledge of osteoporosis which correlates with previous studies. Significant increase in the awareness level of Chinese society was noticed between 2011 and 2018 from %30.7 to %67.8, respectively.

Conclusion
Knowledge of osteoporosis among Saudi society is way behind the required level. Raising the awareness of the individual will help to decrease the prevalence of osteoporosis and osteoporotic fractures leading to decrease in morbidity and mortality, burden, and cost.


Others Hamzah M Magableh, Fellow Sufyan Ibrahim, Mohamad Bydon.

Introduction
Spinal tumors encompass gamut of slow-growing and locally aggressive benign tumors, primary malignant neoplasms, and metastatic lesions. Numerous resection techniques are regularly utilized to effectively target the entire tumor while also seeking to minimize unintended spinal cord injury. In this study, we aimed to compare the outcomes of en bloc resection, piecemeal resection, and separation surgery followed by spine stereotactic radiosurgery (SSRS) in the surgical management of spinal tumors.

Methodology
A comprehensive systematic review of the literature was performed to identify studies directly comparing the efficacy between at least any two of the three resection strategies: en bloc spondylectomy, piecemeal excision, and separation surgery followed by SSRS. A network meta-analysis was performed to concurrently compare the three surgical interventions in a single analysis by synthesizing both direct and indirect evidence across the network of included studies. Direct comparative meta-analyses between en bloc and piecemeal resections were also carried sub-analyzing the effect of tumor type (benign vs malignant) and specific histology on the clinical outcomes.

Result
A total of 26 studies consisting of 708 patients with primary or metastatic spinal tumors were included, of which 293 underwent en bloc resection, 353 piecemeal resection and 62 underwent separation surgery with SSRS. En bloc resection was associated with significantly higher progression-free survival (PFS) (RR=1.33), and lower risk of tumor persistence (RR=0.56) and mortality (RR=0.66) compared to piecemeal resection. There was no statistically significant difference in these outcomes between separation surgery followed by SSRS cohort versus en bloc or piecemeal resections (all p>0.05). On subgroup analysis, en bloc resection of only malignant lesions retained significantly higher odds of PFS (OR=5.31) and lower mortality odds of PFS (OR=0.28) when compared to piecemeal resections.

Conclusion
En bloc spondylectomy yielded superior results to piecemeal excision, with improved patient outcomes in terms of higher PFS, reduced disease persistence, and lower mortality risk. However, en bloc surgery was associated with increased postoperative complications compared to piecemeal, despite lower incidental durotomy risk; no significant distinctions were observed between separation surgery with SSRS and en bloc/piecemeal procedures in long-term status or outcomes.
Abstract 2682: Cross-Cultural Adaptation and Validation of the Italian Spine Youth Quality of Life (Isyqol) Questionnaire’s Arabic Version.

Assoc. Prof. Salah M Fallatah, M. D. Shaker Emam, M. D. Ghamid Al-Ghamdi, Professor Faisal Almatrafi.

Introduction
Health-related quality of life (HRQOL) assessment is considered among the most relevant outcome measures following conservative and surgical interventions for various spinal conditions. Several questions are available to evaluate HRQOL in these conditions. A more recent Italian Spine Youth Quality of Life (ISYQOL) questionnaire was developed for this purpose and showed high validity in measuring HRQOL.

Methodology
To translate and adapt the ISYQOL questionnaire into Arabic language (ISYQOL-Ar) and evaluate its validity and reliability, and to correlate it with the validated revised Scoliosis Research Society (SRS22-r)’s Arabic questionnaire in a cross-sectional multicenter study. The ISYQOL was translated, back-translated, and reviewed by an expert committee. Reliability assessment for the questionnaire domains was performed using Cronbach’s alpha. For construct validation, the Pearson’s correlation coefficient was used.

Result
A total of 115 patients were enrolled in the study and completed the ISYQOL-Ar and Arabic SRS22-r questionnaires. A total of 72 patients (%63) completed the first set of questionnaires, and 2 weeks later, 63 patients (%55) completed both sets of questionnaires, with 15.8 a mean age, °39.5 mean Cobb angle of %88.9 females. ISYQOL-Ar showed excellent validity, good reliability, and internal consistency for spine health and brace wear, with Cronbach’s alpha > 0.6, similar to SRS22-r in the same cohort. The correlation was significant between ISYQOL-Ar and Arabic SRS22-r (Pearson’s coefficient=0.708, P<.001).

Conclusion
The ISYQOL-Ar questionnaire is a reliable and valid outcome measure for the assessment of young patients with spinal deformity among the Arabic-speaking population.


Assoc. Prof. Faris Abdullah Alodaibi.

Introduction
Pain Neuroscience Education (PNE) is increasingly being integrated into chronic pain interventions as an essential treatment component. However, the majority of the existing PNE literature primarily originates from the United States, Europe, and Australia, which may limit its applicability and accessibility to diverse populations.

Methodology
This review examines the best practices and key facets of PNE interventions for diverse populations. Selection criteria include recent, peer-reviewed studies concerning PNE principles, effectiveness, implementation, and cultural nuances. Searches span PubMed, Google Scholar, Cochrane Library, and among others. Boolean operators combine keyword searches, and relevant articles are selected based on their titles, abstracts, and methodologies.

Result
Findings will be presented describing the most effective practices and components for PNE interventions.

Conclusion
There’s a pressing need for culturally adapted PNE materials for different cultures including Arabic-speaking patients in Saudi Arabia with chronic musculoskeletal pain. This research’s initial findings will inform subsequent stages of the study.


Introduction
Text neck syndrome, known as repetitive stress pain, is an injury that results from extreme watching or texting on handheld devices for an extended period of time. The use of mobile phones is increasing rapidly, and people spend long hours on them that also leads to other musculoskeletal problems. This study aimed to identify the prevalence and knowledge of residents toward Text neck syndrome in Jazan, Saudi Arabia.

Methodology
This is a cross-sectional online survey among the Saudi population in Jazan, Kingdom of Saudi Arabia. The questionnaire contained socio-demographic information and questions to assess the awareness and prevalence of Text neck syndrome.

Result
A total of 385 Jazan residents responded to this questionnaire. Among them, %50.1 were in the age group between 21 and 30 years, %61 used smartphones for more than 5 hours per day, %90.1 were aware of the harms of using smartphones, while only %14.8 had previously heard about Text neck syndrome. Among the participants, %47.2 agreed that it was multi-factorial. Although %1.6 of the participants were diagnosed with this syndrome, %80.5 of the responders had more than one symptom using smartphones. About %93 of the responders believed that they should reduce using smartphones because of their symptoms. The average knowledge score was 3.2 ± 6.4, out of 15 points. Factors significantly correlated to high knowledge levels included age between 31 and 40 years (p-value = 0.023), higher educational level (p-value < 0.001), living in cities (p-value = 0.043), hearing previously about Text neck syndrome (p-value = 0.002), and being diagnosed with this syndrome (p-value = 0.013).

Conclusion
Text neck syndrome is underdiagnosed in Jazan, Saudi Arabia. This can be due to the inadequate level of knowledge of the public about this syndrome.


Mr. Abdulaziz Saad Aljuaid, Mr. Abdulrahman Mutlag Almalki, Mr. Emad Atiah Alzahrani, Mr. Khalid Abdulelah Alhazmi, Ms. Sara Bandar Badirah, Ms. Rowaina Ibrahim Abu Saeed.

Introduction
Brucellosis is an endemic zoonotic disease that has a global propagation and is considered to be a major health problem worldwide. Conversely, The predominant symptom is undulating fever, followed by fatigue, sweating, malaise, anorexia, and arthralgia. Additionally, musculoskeletal and reticulo-endothelial organs are the main target of infection. Brucellosis has multiple complications that affect different organs and systems, which results in endocarditis, arthritis, and neurologic symptoms. However, spondylitis and spondylodiscitis are the most frequent complications (also known as spinal brucellosis). Therefore, this study aims to compare antibiotic treatment regimens for spinal brucellosis in our center and evaluate their efficacy.

Methodology
This retrospective cohort study was conducted at Al-Noor tertiary hospital in Makkah City. Using a convenience sampling technique, we included all the patients of all age groups and both sexes in the 11 years from 2010 to 2021 who were diagnosed with brucellosis based on polymerase chain reaction with a titer of 2-mercaptoethanol (-2ME) ≥1:80 in the presence of clinical signs and symptoms compatible with brucellosis and have
Magnetic Resonance Imaging (MRI) findings suggestive spinal brucellosis (spondylitis or spondylodiscitis). In addition, 9 different regimens were included in the study, in which, 7 were triple and 2 were dual.

**Result**
A total number of 35 patients were included and analysed in the current study. He first-line regimen therapy of eight different types of therapy combinations prescribed to the patients. Hence, the most frequently administrated regimen was the combination of streptomycin, doxycycline, and rifampicin (SDR) (twenty patients, %55.6) followed by the combination of streptomycin, rifampicin, and trimethoprim/sulphamethoxasol (SRT) (eight patients, %22.2). Overall, among a total of 35 patients who received first-line treatment, only six patients had a failure of therapy response, and surgery was indicated in 3 patients.

**Conclusion**
In this study, we found that dual versus triple therapy are both effective regarding spinal Brucellosis intervention, with some previously illustrated differences in duration of therapy, failure rate, and overall cure rate. However, further studies are needed on a larger sample size to support the provided evidence.
SPONSORS
SPONSORS

DIAMOND

AMICO

Medtronic
Further, Together

GOLD

DePuy Synthes

ProMedEx

SILVER

ZIMMO

BRONZE

stryker

COPER

Baxter