

# EGYPTIAN SPINE ASSOCIATION 12<sup>th</sup> International Annual Conference 2022 Abstracts

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## #ESA Abstracts 20220101

### Modified Omar Sign for the Clinical Diagnosis of Unilateral Foraminal Stenosis Associated with Disc Prolapse

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**Introduction:** Clinical diagnosis of unilateral foraminal stenosis is an important problem. This retrospective study analyses the validity of the Modified Omar's test for the clinical diagnosis of unilateral lumbar foraminal stenosis associated with disc prolapse.

**Methods:** This study analyses 250 patients with unilateral sciatic pain, between 2011 and 2020. All the data was obtained from the database collected from our institution and our private clinics. All patients had a standardized neurological assessment with applying the modified Omar test during their examination, then comparing the clinical findings with the MRI imaging. The postoperative clinical finding's looking for absence of modified omar sign were also compared to the preoperative one.

**Results:** The modified Omar test was applied during the physical examination. The test was positive for all selected patients with positive unilateral lumbar disc prolapse with foraminal stenosis in MRI finding at the same side of the sign. Comparing the clinical finding preoperative and after surgical intervention or after nerve root block the test was negative which is a sure sign for availability of the test.

**Conclusion:** The modified Omar test is a clinical test applied during the neurological examination for diagnosis of lumbar foraminal stenosis. The correlation between clinical and radiological findings confirms the test availability with absence of Omar sign after surgical intervention, and after nerve root block. The test is sensitive and more reliable diagnostic tool for the clinical diagnosis of foraminal stenosis and for the clinical follow-up after surgical intervention.

## #ESA Abstracts 20220102

### Serial Mehta Casting for Idiopathic Early-Onset Scoliosis

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**Introduction:** A retrospective clinical study of patients with idiopathic early-onset scoliosis (IEOS) treated by serial Mehta cast in a single facility.

The out-come was assessed clinical, radiological, and health-related quality of life (HRQoL) assessment using the 24-item early-onset scoliosis questionnaire (EOSQ-24).

**Methods:** A standardized casting protocol was used for patients suffering from IEOS with a curve  $\geq 20^\circ$ , aging  $\leq 5$  years. Patients' demographics, complications and major curve Cobb angle were recorded and HRQoL assessment using EOSQ-24 were done.

**Results:** 15 patients with IEOS were managed by serial Mehta cast between, with a mean follow-up period of  $42.33 \pm 6.37$  (range 32:55) months. The mean pre-cast curve was  $56.8 \pm 12.01^\circ$  and the mean final post-cast curve was  $26.4 \pm 19.12^\circ$  ( $P = 0.0008$ ). EOSQ-24 was inversely proportional

to the magnitude of the residual curve. There were 2 cases with superficial skin irritation and one case with repeated vomiting after casting. **Conclusion:** IEOS can be managed effectively by serial Mehta cast which is proved not only by the clinical and radiological outcome but also by the improvement of the quality of life of the patients and their families as measured by EOSQ-24.

## #ESA Abstracts 20220103

### Modified Anterior Transarticular C1/2 Fixation for Odontoid Fractures: An Approach with High Complication Rate in Geriatric Population

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**Introduction:** Evidence, that conservative therapy for unstable odontoid fractures in the elderly has higher morbidity and mortality than operative therapy has emerged. Anterior and posterior operative strategies for unstable odontoid fractures in this population coexist. While there are some reports about morbidity and mortality for posterior operations, there is a relative paucity of data about anterior procedures. In our department we applied a modified anterior transarticular C1/2 fixation with lesser need for pharyngeal mobilization than the standard anterior tripple or quadrupple osteosynthesis as the most common operative strategy used for treatment of these fractures in the elderly.

**Methods:** Between Juli 2010 and February 2018, 36 patients underwent a modified anterior transarticular C1/2 fixation with additional single odontoid screw through a right-sided Smith-Robinson-approach with a short and steep screw trajectory for the right and long trajectory for the left side. We included in this retrospective analysis odontoid fracture patients who were 75 years or older at the time of surgery (29 patients, 8 male/21 female). All patients suffered odontoid fractures type II, some of them with additional ligamentous injuries or atlas fractures.

**Results:** The mean operating time was 55.8 minutes. The mean age was 82.6 years (75-95y). Mean Age-Adjusted Charlson Comorbidity Index (CCI) was 5.3 points (range 3-12), and mean ASA score was 2.9 points (range 2-4). There were no intraoperative complications and blood loss was minimal in all cases. One patient with delayed swallowing problems had low grade infectious implant loosening and dislocation, he underwent implant removal and long-term antibiotic drug therapy. The most common medical complications were aspiration pneumonia (24.1%, n=7), altered mental status (17.2%, n=5) and cardiac decompensation (6.9%, n=2). The 30-day mortality rate in this group of patients is 13.8% (4 patients), while the 1-year mortality rate was 27.6% (8 patients).

**Conclusion:** Although the modified version of anterior transarticular C1/2 fixation and odontoid fixation allowed less pharyngeal mobilization and required a relatively short operative time, the procedure was associated with a significant amount of postoperative Dysphagia, which in some cases lead to aspiration and death. Despite the theoretical advantages of supine positioning and short operative time, and little intraoperative complications, dysphagia and aspiration seem to be the major problem in the elderly especially if comorbidities exist like dementia or parkinsonism. Estimation of the risk factors for such

complications should play a role in the decision-making process and a posterior approach or conservative therapy should be considered for patients at high risk.

#### #ESA Abstracts 20220104

### Free Hand Technique for Lateral Mass Screws Insertion; A Safe, Accurate, and Simple Procedure for Posterior Cervical Spine Fixation

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**Introduction:** Posterior cervical fixation techniques are commonly performed procedures in the surgical management of subaxial cervical spine diseases. Lateral mass screw fixation became the standard method for posterior cervical spine fixation. It is considered an optimum method for cervical stability reconstruction following posterior cervical decompression.

**Methods:** 30 patients with cervical canal stenosis and multiple disc prolapse were operated on in Benha university hospitals with 172 lateral mass screws inserted with freehand technique through a midline posterior approach. Post-operative computed tomography CT scans were used to assess the accuracy and safety of the free hand technique.

**Results:** One hundred seventy two screws were inserted in 30 patients with an average of 6 screws per case. A post-operative CT scan was done to assess the position and trajectory of the screws as well. 172 screws inserted easily and correctly with no complications while 8 screws were failed to be inserted because of a violation of the lateral mass during the insertion. No vascular nor neurological complications were encountered in the post-operative period or the follow-up period.

**Conclusion:** The freehand technique is a safe technique to insert lateral mass screws with a very good post-operative purchase and a high level of safety and feasibility. **Keywords:** Lateral mass, complex spine surgery, spine fixation, cervical spine.

#### #ESA Abstracts 20220105

### Shilla Technique for Correction of Early Onset Scoliosis: Early Results of a Case Series at Assiut Al Azhar University Hospital

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**Introduction:** Early onset scoliosis is defined as scoliosis that starts before the age of 10 years whatever its etiology. It is one of the major spine issues that necessitates further studies and long term follow up of various surgical and non-surgical tools. Treatment of EOS with growing rods or VEPTR techniques have unpredictable outcome that may be very successful or even catastrophic according to etiology, severity and flexibility of the curve and associated kyphosis. Shilla technique has the advantages of no need for periodic surgical lengthening every planned period and lower rate of complications.

**Methods:** All children presented to the outpatient clinic at al Azhar university hospital Assiut branch with diagnosis of early onset scoliosis whatever the etiology were consulted and planned for surgery with Shilla technique. Four sliding screws were applied at the upper end of the curve and four at its lower end with either two or four screws at the apex. Extra periosteal and non-fusion dissection were aimed at the upper and lower segments while sub periosteal dissection and fusion was targeted at the apex.

**Results:** The total number of surgeries performed was 14 (12 index surgeries and 2 unplanned surgeries) The initial mean Cobb angle improved after the index surgery from 82.3o to 18o apical vertebral translation and spinal height were also improving. Two complications were recorded during the study period (1 proximal pulling out and another case with superficial infection).

**Conclusion:** Despite the short time of follow up of our study Shilla technique is a successful option for EOS long term follow up is needed.

#### #ESA Abstracts 20220106

### Perioperative Assessment of Sagittal Balance of Congenital Sharp Angular Kyphosis

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**Introduction:** Sharp angular kyphosis remains a difficult challenge for all spine surgeons. The management goal of sharp angular spine deformity is to realign the spine and safely decompress the neurological elements. Kyphosis in general unlike scoliosis, there is a lack of classification system providing uniformity in description and guiding decision making for kyphotic deformity in relation to sagittal balance of the spine. The aim of the present study was to discuss a new classification of kyphotic deformity, assessment the sagittal balance and guiding the decision to achieve better outcome and balanced spine after posterior correction.

**Methods:** The study was conducted on 12 patients were operated via posterior only approach for vertebral column resection (VCR) at the apex of the deformity with correction of the deformity in relation to the specific measurements of sagittal balance using Surgimap software program for every patient at Neurosurgery Department, Zagazig University from 2019 to 2021.

**Results:** Follow-up period ranges from 8 months to 24 months. Mean angle of kyphosis 90 degree corrected to less than 8 degrees. Our study showed improvement of sagittal alignment with good correction of the deformity matching patient good outcome with no neurological deficit.

**Conclusion:** Perioperative assessment of sagittal balance of each patient and correction of the deformity according to patient's specific measurement result in achieve good outcome and avoids proximal junctional kyphosis. VCR is a powerful tool for correction but it is technically demanding and tricky.

#### #ESA Abstracts 20220107

### Multi-slice Computed Tomography Scan Assessment of Accuracy and Safety of Free-hand Pedicle Screw Fixation in Adolescent Idiopathic Scoliosis

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**Introduction:** Various methods to help guidance of screw purchase in AIS have been described in the literature. Free-hand technique is a relatively easy and is as accurate as other methods. MSCT scan, the most accurate method of postoperative evaluation of screw purchase still needs more research.

**Methods:** This prospective clinical case study aims to evaluate the accuracy and safety of the pedicle screw fixation (PSF) with free-hand technique in AIS using postoperative MSCT scan. In this prospective study all patients with AIS underwent correction using the free-hand

PSF were reported. All patients underwent whole spine X-ray and MSCT scan during the follow up. Screw purchases were evaluated according to Gertzbein Robbin classification.

**Results:** A total of 45 patients were recruited for this study with mean age  $14.7 \pm 1.7$  including 39 females and 6 males. Of the total 870 pedicle screws, 85.1% (740) screws were accurate within the pedicle, while 14.9% (130) of inserted screws penetrated the pedicle either in the thoracic (18.27%) or lumbar (5.96%) spine. Medial wall penetration was reported in (5.86%) or while lateral in (9.04%) of the patients. Correlation of screw purchase accuracy to age, sex, curve type, Cobb angle, spinal region showed no statistically significant correlation.

**Conclusion:** The data of this prospective study suggest that pedicle screw fixation with free-hand technique in adolescent idiopathic scoliosis population appears to be an accurate and safe procedure.

#### #ESA Abstracts 20220108

### CRP or WBCs: Which is More Relevant to Differentiate Postoperative Inflammation from Early Infection in Postoperative Follow-Up of Spine Deformity Surgery?

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**Introduction:** Postoperative inflammation and infections are common complications of spinal surgery and have similar symptoms. However, postoperative infection may lead to a poor outcome and must be differentiated from postoperative inflammation. The objective of this study is following the changing pattern of postoperative CRP and WBC counts and compare them to the clinical condition of the patient to find which one is better used as a standard for early detection of early infection.

**Methods:** 50 patients who underwent spinal deformity correction surgery without clinical signs of infection like fever, wound redness or discharge were enrolled in this prospective study. The C-reactive protein (CRP) and white blood cell (WBC) counts were measured in the 2nd and 7th postoperative days. We tried to detect the type of correlation between both CRP and WBCs level and clinical condition of patient regarding wound local condition.

**Results:** All cases showed high CRP by 2nd day postoperative which decreased significantly but did not reach normal levels even by 7th day. All cases showed elevated WBCs count by 2nd day which decreased to normal levels by 3rd day in 86 % of patients and by the 7th day, 94 % of cases showed normal levels. In addition, WBCs in 2nd day postoperative significantly positively correlated with fusion level and operative time. There was no significant correlation between WBCs and blood transfusion nor age. No significant correlation between CRP and the Number of fusion levels, blood transfusion nor operative time.

**Conclusion:** We found that WBCs count returned earlier to normal levels than CRP (which remains positive for a week later) in our cases, So monitoring early changes in the first week in WBCs count pattern is more indicative of infectious process going on than monitoring CRP.

#### #ESA Abstracts 20220109

### Biomechanics of Spinal Instrumentations and Bone healing; Basic Concepts & Clinical Implications

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**Introduction:** Spinal instrumentation aims to support the spine when its structural integrity is severely compromised. While the biological basis of bone healing has been well studied, less is known about the

mechanical factors that play key roles in the success of the healing process. This study emphasizes the importance of understanding the biomechanical aspect of spinal instrumentation & related bone healing biology aiming to optimize the outcome of patients with spinal disorders.

**Methods:** A brief review of the fundamental biomechanical principles of spinal instrumentations. Adequate stabilization/deformity correction is predictive of better functional outcomes. Reviewing the most used spinal instrumentations from the biomechanical perspective as well as the relevant clinically related real-life situations.

**Results:** Understanding the fundamentals of spinal instrument's biomechanical characteristics is a crucial prerequisite for spine surgeons. Proper selection of the fixation construct typically reduces the possibilities of construct failure. Rigid/Semi-rigid fixation would allow the best environment for proper bone healing/fusion. Cautions if dissimilar metals are used together. Pedicular screw diameter/length and depth would affect its pullout strength. Pre-bent rods are preferably used to avoid notch-related affection of fatigue strength.

**Conclusion:** The knowledge of biomechanical principles of spinal instruments and their applications, as well as the biology of bone healing, serve to reduce the rate of implant failure and mal/non-union as well as ensure adequate correction &/or stabilization/fusion with the improvement of the overall patient outcome.

#### #ESA Abstracts 20220110

### The Use of Prophylactic Antibiotics in Spine Surgery; Evidence-Based Versus. Expedience

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**Introduction:** Surgical Site Infection (SSI) after spine surgery can have devastating consequences. Antibiotics have been utilized prophylactically with surgeries to protect healthy individuals exposed to pathogenic bacteria at the surgical incision site. No single regimen for prophylactic antibiotics has been shown to be superior for all patients or for all spine surgeries. This study reviews the relevant literature aiming to extract evidence-based data regarding the role of prophylactic antibiotics in reducing SSI to optimize the outcome of patients undergoing spinal surgeries.

**Methods:** The up-to-date experimental and clinical literature concerning the value of postoperative antibiotics in reducing SSI in spine surgeries were reviewed. Evidence from clinical trials was categorized as Class I (well-conducted randomized prospective trials), Class II (well-designed comparative clinical studies), or Class III (retrospective studies).

**Results:** While plenty of literature concentrates on the paramount importance of preoperative decolonization, showering with antiseptics, and adequate surgical skin preparation, pre/intra-operative use of prophylactic antibiotics is still considered an essential part of perioperative medications. A few placebo-controlled trials have proven the efficacy of prophylactic antibiotics in decreasing surgical wound infections. Contradicting results of the value of extending the use of antibiotics after surgery (24 hours) in decreasing SSI even when drains are still in place have been reported. Adequate microbiological mapping of common pathogens for a certain region/institution should guide the proper use of antibiotics. Intra-wound Vancomycin in spine surgeries has shown promising results in reducing SSI and became a standard procedure adopted by many spine centers.

**Conclusion:** Despite the theoretical added value of extending the prophylactic antibiotics after spine surgeries, there is no clear evidence to support its role in decreasing the rates of surgical site infection. Preoperative bacterial decolonization, strict aseptic precautions during

surgery, and utilizing local wound antibacterial agents might help with minimizing the need for post-operative antibiotic use.

### #ESA Abstracts 20220111 Management Strategies for Symptomatic Peripheral Nerves and Brachial Plexus Tumors

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**Introduction:** Peripheral nerve tumors are a diverse group of lesions histologically and in their clinical behavior. The genetic disorders neurofibromatosis type 1 and 2 and schwannomatosis are significant risk factors for the development of peripheral nerve tumors. An understanding of these disorders is important in allowing appropriate management. Active treatment of peripheral nerve tumors is reserved for lesions that are malignant or causing neurologic dysfunction, pain, compressive symptomatology, or cosmetic concern.

**Methods:** This Study was conducted in neurosurgery department Mansoura university from 2016 to 2019 on 28 tumors in twenty six patients twelve males and fourteen females their ages ranged from 8-59 years. All of them were presented with symptomatic peripheral nerve and brachial plexus tumors and were operated on for excision or biopsy.

**Results:** Surgical excision for twenty-seven tumors and one was only biopsied. In this study there were four malignant tumors and twenty-four benign tumors. One case with mild neurological deterioration and one case with superficial wound infection.

**Conclusion:** Symptomatic peripheral nerve tumors should be fully investigated and wisely managed.

### #ESA Abstracts 20220112 Surgical Intervention of Tarsal Tunnel Syndrome, Personal Experience

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**Introduction:** Compression over the posterior tibial nerve while passing beneath the flexor retinaculum on its way to the sole of the foot is known as the tarsal tunnel syndrome. First described by Kopell and Thompson in 1960. Multiple coincident events do affect the net result of the surgical intervention especially presence of multiple branches that have discrete functions.

**Methods:** twelve patients (2 males and 10 females) with average age 40 (age ranged from 30-50) were presented with paresthesia, pain and numbness in the planter aspect of the foot. All but one presented with bilateral presentation. All but one operated in separate sessions. The Visual Analogue Scale (VAS) was used to assess the extent of the relief of the patients. Nerve conduction velocity studies (NCV) were done for preoperative evaluation. The mean follow up period was 8.4 months.

**Results:** two patients were males while 10 were females. The time interval between the traumatic insult and the surgical intervention was about 2 months in the post-traumatic patient. Planter flexion was G5 in all patients on MRC scale. All the patients underwent neurolysis of the posterior tibial nerve and its branches. Mean time of the surgery was about 30 minutes. Mean amount of blood loss was 80 cc. the surgical team was the same in all the cases. One skin incision fashion was used in 5 patients while other patients underwent 2 separate skin incision fashion. Ten patients underwent dramatic relief while one patient

showed persistent paresthesia for about 10 months and one patient showed persistent pain for 6 months and managed medically. Other complications were detected: hematoma in 1 patient, superficial infection in 1 patient. The average period of recovery was 3 months. The mean follow-up period was 8 months.

**Conclusion:** Decompression of the posterior tibial nerve alone does relieve the symptoms in great extent but to achieve complete relief, some surgical tricks while manipulations of the branches of the posterior tibial nerve, must be followed.

### #ESA Abstracts 20220113 Safety and Efficacy of Posterior Vertebral Column Resection in Complex Pediatric Deformities

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**Introduction:** Vertebral column resection (VCR) is a well-known technique used for correction of complex spinal deformities. VCR could be done through a posterior only approach (Pvcr), or a combined anteroposterior approach, with almost comparable results. Early studies of Pvcr have reported high rates of complications, while subsequent studies have reported a reasonable complication rate.

**Methods:** This retrospective cohort study aims to evaluate the safety and efficacy of performing Pvcr to correct complex pediatric deformities. Data collected from the database of 21 pediatric deformity patients who were operated on for correction of their deformities using posterior instrumentation and Pvcr at a single institution from 2015 to 2019. Clinical assessment using the self-image domain (part of SRS-22 questionnaire), and radiological assessment via calculation of Cobb angle correction percentage.

**Results:** 21 pediatric patients with a mean age  $15.2 \pm 3.5$  years were enrolled in this study. The mean follow up period was  $26.3 \pm 3.1$  months. The mean Cobb angle has decreased significantly from  $82.9 \pm 23.9$  degrees to  $28.8 \pm 14.2$  immediately after correction (correction rate  $66.9 \pm 10.8\%$ ,  $p < 0.001$ ) with slight increase to  $30.2 \pm 14.9$  after 24 months of follow up (correction loss  $4.3 \pm 3.1\%$ ). The mean estimated blood loss was  $2816.7 \pm 1441.5$  ml. The mean operative time was  $339 \pm 84.3$  minutes. Self-image domain (part of SRS-22 questionnaire) has significantly improved from a mean preoperative of  $2.3 \pm 0.5$  to a mean postoperative of  $3.9 \pm 0.4$  after 24 months of correction ( $p < 0.001$ ). As regards complications; chest tubes were inserted in 17 cases (81%), one case (4.8%) had suffered from deep wound infection and temporary respiratory failure, while 3 cases (14.3%) had neurological deficits.

**Conclusion:** Posterior vertebral column resection is considered a highly effective release procedure that aids in the correction of almost any type of complex pediatric deformities with a correction rate reaching  $66.9 \pm 10.8\%$ . However, Pvcr is a challenging procedure with high estimated blood loss and risk of neurological deficits, so it must be done only by experienced spine surgeons in the presence of good anaesthesia and neuromonitoring teams.

### #ESA Abstracts 20220114 Spinal AVF; Protocol of Management and Predictive Factors of Outcome

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**Introduction:** Spinal cord arteriovenous fistulas are rare cause of progressive myelopathy. The predictive factors of their outcome after endovascular or surgical treatment are still controversial.

**Methods:** Twenty patients were diagnosed with spinal arteriovenous fistulas; 13 of them had dural and 7 had perimedullary fistulas (1 Dorsal and 6 Ventral). Surgery, endovascular or both treatments were used.

**Results:** Ten of the 13 patients in the dural group were surgically treated, while 2 were managed by embolization and one combined. Seven patients improved, while 6 patients showed stationary clinical course after intervention. Five patients in the perimedullary group were embolized with clinical improvement, 1 patient refused intervention, and 1 patient had surgery. Clinical improvement was significantly correlated to the duration of symptoms before intervention ( $p=0.012$ ), and preoperative neurological condition ( $p=0.001$ ). No significant correlation was found with age, anatomic level of the fistula, fistula type, and type of intervention.

**Conclusion:** Microsurgery was preferred for dural and dorsally located perimedullary fistula, while embolization was preferred for ventrally located ones. Clinical improvement was significantly correlated with early intervention and preoperative neurological condition of the patient. Age of the patient, fistula type, fistula location, and type of intervention did not show significant relation to the outcome. Patients could benefit from intervention even if they present with poor neurology.

#### #ESA Abstracts 20220115

##### Prevention of Lumbar Plexus Injury During Transpsoas Approach

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**Introduction:** Low back pain (LBP) is a common musculoskeletal disorder. In Egypt, patients with LBP constitute a high percentage of patients seeking medical care at outpatient clinics. Spinal fusion is a common treatment for spinal disorders such as disc degeneration, deformity, spondylolisthesis, or fracture. The minimally invasive lateral retroperitoneal transpsoas approach is a recent technique developed to avoid complications associated with traditional or minimally invasive anterior or posterior approaches to the lumbar spine. This technique provides a small incision that avoids significant abdominal muscle injury and lateral access to the disc space from L1-L2 to L4-L5. This cadaver study aims to define a safe entry zone in the psoas muscle to prevent lumbar plexus injury during the transpsoas approach.

**Methods:** A total of 30 cadavers were used in this study where each cadaver was dissected from both sides. Each cadaver was placed in lateral decubitus and a skin incision in the midaxillary line from the last rib to iliac crest was made. Then, the peritoneum was dissected, psoas muscle was exposed, and nerve roots were identified and reported at each disc space from L1-L2 to L4-L5. The safe entry zone was defined by the absence of crossing of a lumbar plexus branch.

**Results:** Each disc space was divided into four zones: zone 1, the posterior quadrant; zone 2, the middle anterior quadrant; zone 3, the middle posterior quadrant; zone 4, the posterior quadrant. The safe working zone includes zones 2 and 3 at level L1-L2, zone 3 at level L2-L3, zone 3 at level L3-L4, and zone 2 at level L4-L5. There was no variance observed between either side regarding the relationships between the lumbar plexus and the intervertebral disc.

**Conclusion:** Knowledge of the anatomy of lumbar plexus roots in psoas muscle is mandatory to prevent injury to lumbar plexus roots during entry of dilator through psoas muscle. This anatomical study suggests that there are certain safe zones at the lumbar disc spaces that

allow passage of dilator inside psoas muscle to reduce direct nerve injury of the lumbar plexus.

#### #ESA Abstracts 20220116

##### Free Hand Technique for Lateral Mass Screws Insertion; A Safe, Accurate, and Simple Procedure for Posterior Cervical Spine Fixation

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**Introduction:** Posterior cervical fixation techniques are commonly performed procedures in the surgical management of subaxial cervical spine diseases. Lateral mass screw fixation became the standard method for posterior cervical spine fixation. It is considered an optimum method for cervical stability reconstruction following posterior cervical decompression. This study aims to assess the feasibility safety and accuracy of the free hand technique in insertion of Lateral mass screws in the sub-axial spine

**Methods:** Thirty patients with cervical canal stenosis and multiple disc prolapse were operated on in Benha university hospitals with 172 lateral mass screws inserted with freehand technique through a midline posterior approach. Post-operative computed tomography CT scans were used to assess the accuracy and safety of the free hand technique.

**Results:** One hundred seventy-two screws were inserted in 30 patients with an average of 6 screws per case. A post-operative CT scan was done to assess the position and trajectory of the screws as well. 172 screws inserted easily and correctly with no complications while 8 screws were failed to be inserted because of a violation of the lateral mass during the insertion. No vascular nor neurological complications were encountered in the postoperative period or the follow-up period.

**Conclusion:** The freehand technique is a safe and reliable surgical technique to insert lateral mass screws with a very good post-operative purchase and a high level of safety and feasibility. Neurovascular complications are usually avoidable when using this trajectory.

#### #ESA Abstracts 20220117

##### Surgery for Synovial Cyst of The Lumbar Spine, Strategy, and Results

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**Introduction:** Synovial cyst of the vertebral facet joint is one of the sources of nerve root compression. Despite different lines of treatment for such pathology, there is no consensus has been formed so far as an optimum method to treat synovial cysts. This retrospective clinical case study aims to clarify the role of surgical management as well as factors influencing the outcome of treating 15 patients with a lumbar synovial cyst.

**Methods:** 15 patients with a mean age of 55 years underwent surgery for medically intractable radicular pain or neurological deficits caused by synovial cysts. The patients' records were retrospectively analyzed for neurological deficits, operative management, segmental hypermobility, and clinical outcome; CT and MRI were analyzed for cysts diameter and additional degenerative changes. The pain was assessed using the visual analog scale (VAS) and the Subjective postoperative satisfaction was analyzed based on MacNab classification into excellent (no pain), good (some pain), fair (moderate pain), and poor (unchanged or worse).

**Results:** Excellent results were documented in 12 patients, the outcome was good in 3 cases, and recurrence was reported in one case. 3 patients were found to have hypermobility of the facet joints and the other 6 patients had spondylolisthesis. There was no correlation between cyst diameter, operative approach, and outcome. No intraoperative or postoperative complications or mortality were reported.

**Conclusion:** Surgery for synovial cyst of the lumbar spine has a favorable outcome, however instability of the lumbar spine is an important factor that should be significantly considered in the management. Fixation using transpedicular screws should be considered in cases with severe low back pain associated with degenerative spondylolisthesis or marked hypermobility of the lumbar spine.

#### #ESA Abstracts 20220118

### Utilization of 3D-Printed Spine Model for The Pre-Operative Planning Of Complex Congenital Spinal Deformity Correction

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**Introduction:** Utilization of 3D-printed spine model for the pre-operative planning of complex congenital spinal deformity correction is anew trend. The purpose of this study is to demonstrate the effectiveness and efficiency of utilizing 3D- printed spine model in the pre-operative planning of complex spinal deformity correction and its use in intra-operative execution of the proposed plan.

**Methods:** We had 5 patients with complex congenital spinal deformity that presented to our institution for corrective spinal surgery. A 3D-printed model was prepared for each patient based on his CT scan. The model was used for better understanding of the complex spinal deformity, planning the resection/osteotomy, identification of the entry point and trajectory of the pedicle screws.

The 3D-printed model was sterilized using plasma sterilizer for intra-operative use.

**Results:** The 5 patients went through the corrective surgery. 2 patients had transient neuromonitoring signal changes during the spinal osteotomy that returned to the baseline. The average operative time was 5 hours (range 4-6), average blood loss 700 ml (400-1100 ml), all pedicle screws planned were inserted using the free hand technique and the guidance offered by the model. No major complications occurred during the surgeries. All Patients achieved adequate spinal deformity correction with maintaining a balanced spine.

**Conclusion:** The use of 3D-Printed model in complex congenital spinal deformity correction is an effective tool in the planning of the corrective osteotomy and pedicle screw insertion. It decreases the operative time, reduces blood loss and improves the surgeon' orientation intra-operatively.

#### #ESA Abstracts 20220119

### Cervical Kyphosis Correction in Multiple Degenerative Disc Disease

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**Introduction:** Degenerative Cervical Myelopathy (DCM) is an age-related disease of the cervical spine and represents one of the most common causes of spinal cord dysfunction. Surgical intervention is the cornerstone of management in symptomatic. The debate between anterior or posterior approach for pathologies such as cervical

spondylotic myelopathy (CSM) have drawn heated debate but are still inconclusive. The authors compared the anterior and posterior approach used to treat multilevel cervical spondylotic myelopathy (CSM), focusing on sagittal alignment, avoid kyphosis and clinical outcome.

**Methods:** It consists of a prospectively collected consecutive series of 40 patients with degenerative cervical kyphosis who met inclusion criteria between August 2018 and March 2020 were done in Kasr Al Ainy hospital, Cairo University. Were divided into two groups, 20 patients (Group I) had anterior cervical interbody discectomy and fusion group and the other 20 patients (Group II) had posterior laminectomy and lateral mass fixation with an average of 12 months of follow up. The study included 29 males and 11 females. Patients were assessed functionally with Visual Analog Score (VAS) for neck pain and upper limb pain, Disability Index (NDI), Modified Japanese Orthopedic Association scale (mJOA) and complications. Radiological fusion was confirmed with plain X-rays and when indicated with CT scan at 12 months postoperatively.

**Results:** There was statically significant decrease in VAS Neck pain, the preoperative score mean 6.47 decreased to 1.40 in group I and 6.20 decreased to 2.97 in group II. Preoperative VAS score of upper limb pain averaged 7.4 and showed a statistically significant decrease of values to a mean of 1.90 in group I and 7.63 decreased to 3.53 in group II. However, preoperative mJOA score 11.17 increase to 16.57 in group I and 10.63 increase to 17.47 in group after 12 months II. NDI showed significant improvement from a mean of 34.83 to 13.67 in group I and improvement from 32.10 to 15.73 in group II. Radiological fusion in group I was present in 15 of 20 cases (75%) by 6<sup>th</sup> month and in 17 of 20 cases (85%) by one year. In the group II. fusion was present in 11 of 20cases (55%) by 6<sup>th</sup> month and in 15 Of 20 cases (75%) by one year. Four cases (20%) of dysphagia were observed in group I and one cases (5%) in group II; however, all were resolved within 1-2 weeks.

**Conclusion:** These results demonstrate that both anterior and posterior decompression (with instrumentation) are effective procedures to improve the neurological outcome of patients with CSM. However, sagittal alignment may be better restored using the anterior approach but harbors a higher rate of loss of correction.

#### #ESA Abstracts 20220120

### Evaluation of Outcomes of Percutaneous Endoscopic Discectomy in the Treatment of Patients with Lumbar Degenerative Disc Herniation: A Systematic Review Meta-analysis

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**Introduction:** Lumbar discectomy is one of the most common operations performed worldwide for lumbar-related symptoms. During the latter half of the 19<sup>th</sup> century, more techniques were developed to remove the herniated disc with minimal invasiveness. The aim of this study was to analyze the safety and efficacy of percutaneous endoscopic discectomy in the treatment of lumbar degenerative disc herniation for adult patients.

**Methods:** A systematic review was conducted, including adult patients (> 18 years and less than 80 years old) with surgical treatment of lumbar radiculopathy secondary to degenerative herniated discs.

**Results:** results revealed that mean preoperative VAS was 6.05 which improved post operation to 1.35. Mean preoperative ODI score was 56.5 which decreased to 14.2 post operation, and SF-36 physical was used by four studies and mean preoperative score was 42.07 which increased to 76.2 post operation. SF-36 mental score used by three

studies with mean preoperative score was 41.08 which increased post operation to 65.5.

**Conclusion:** PELD appears to be an effective intervention for LDH, as it has a small amount of intraoperative blood loss, short postoperative hospital stay, and good clinical and functional outcomes. It needs more training, as it has a long learning curve.

#### #ESA Abstracts 20220121

### Subtotal Sacrectomy Followed by Maximally Tolerated 3D Conformal Radiation for High-Level Chordomas with Neural Integrity: Technique and Outcome

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**Introduction:** Chordomas are the most common sacral tumors, treated surgically by wide resections with free margins. However, radical resections of high-level chordomas in patients with neural integrity are likely followed by significant neurological deficits that may not be accepted for some patients. This retrospective study aims to present local institutional experience with the technique and outcome of neural-preserving sacrectomy followed by maximal safe radiation therapy in a

cohort of patients having high sacral (S1-S2) chordomas presented with intact neurological functions and not previously treated.

**Methods:** This is a retrospective case series including 14 consecutive high-level sacral chordoma cases who underwent maximal neural-preserving sacrectomy followed by a maximal safe 3-D conformal radiotherapy over a period of about 7 years. The surgical resection, perioperative management including radiotherapy techniques, in addition to, their functional and oncologic outcomes were reviewed. **Results:** Mean age was  $44.6 \pm 4.7$  years, with male predominance. Sacral pain was reported for 2-9 months before diagnosis and all cases were continent with no gross sensorimotor deficits. Surgeries went uneventful with wounds of 2 patients indicated plastic management. Negative margins was achieved in 1 case with lost bladder/bowel functions in 28.6% of cases. Ten cases had disease progression at a mean duration of  $62.4 \pm 27.9$  months. The median survival was 99 months, the 5-year absolute survival rate was 78.6% and the 5-year disease progression was 42.9%. The overall survival in this study was found to be 35.7% with a median follow up of 6.3 years.

**Conclusion:** Despite the promising outcomes at 5 years, the used strategy failed to save sphincteric functions and to achieve an adequate overall survival. We recommend radical resections for young patients reserving neural preserving sacrectomy for older cases with shorter life expectancy.