



The 22nd Annual Meeting of the Israel Spine Society

6-8 April 2022 Wednesday
The Royal Beach Hotel Eilat, Israel

GENERAL INFORMATION

The 22th annual meeting of the Israel Spine Society will be held on Wednesday-Friday, 6th - 8th April, 2022
The Royal Beach Hotel Eilat.

Acting Committee

Gad J. Velan M.D
Chairman

Eyal Itschayek M.D
Secretary

Yoram Anekstein M.D
Treasurer

Ran Harel M.D
Scientific officer

Joshua Schroeder M.D
Member at large

Conference Secretary

Mrs. Shanit Twito

Official Language

The official language will be Hebrew. Certificate of attendance will be provided upon request. Throughout the duration of the meeting, exhibits stands will display spine surgery systems, pharmaceutical and medical products.

Dress code

Casual



SCIENTIFIC PROGRAM

WEDNESDAY - 6TH APRIL

19:30
WELCOME COCKTAIL

THURSDAY - 7TH APRIL

08:30 - 08:35
WELCOME NOTE
G.Velan

SESSION 1: TRAUMA
Moderators: Finkelstein J, Hershkovitch O.

08:36 - 08:45
(1.1) SHORT SEGMENT FIXATION, LONG SEGMENT FIXATION OR NO FIXATION FOR THORACOLUMBAR EXTENSION TYPE FRACTURES IN PATIENTS WITH SPINAL ANKYLOSING DISORDERS. OUR EXPERIENCE.
Barkay G, Apterman S, Ackshota N, Shtewe A, Friedlander A.

08:46 - 08:55
(1.2) DO ALL FRACTURES IN THE ANKYLOTIC SPINE REQUIRE SURGICAL FIXATION?
Stavsky M, Sharabani A, Hamed A, Sarhan M, Arzi H, Barzilay Y.

08:56 - 09:05
(1.3) THE ASSOCIATION BETWEEN VERTEBRAL BODY HOUNSFIELD UNITS AND PROGRESSIVE COLLAPSE OF ACUTE OSTEOPOROTIC COMPRESSION SPINAL FRACTURES.
Smorgick Y, Kalveg-Peled R, Tal S, Rabau O, Anekstein Y, Mirovsky Y, May H.

09:06 - 09:15
(1.4) BONE SCAN AS A DIAGNOSTIC TOOL FOR DIAGNOSING VERTEBRAL COMPRESSION FRACTURES.
Haj S, Rod A, Weiner-Kalish D, Arnon-Sheleg E, Rahamimov N.

09:16 - 09:25
(1.5) EARLY SURGERY FOR THORACOLUMBAR EXTENSION TYPE FRACTURES IN GERIATRIC PATIENTS WITH SPINAL ANKYLOSING DISORDERS DECREASES PERIOPERATIVE PATIENT COMPLICATIONS AND SIX-MONTH MORTALITY.
Barkay G, Apterman S, Sissman E, Shtewe A, Friedlander A, Ackshota N

09:26 - 09:36
DISCUSSION

09:37 - 09:46
(1.6) PERCUTANEOUS SACROPLASTY FOR SACRAL INSUFFICIENCY FRACTURES, A SAFE PROCEDURE WITH GOOD CLINICAL OUTCOMES – A RETROSPECTIVE STUDY.
Quesada Jimenez R, Schroeder J.E, Kaplan L, Yeshuv H.S, Cohen J.

09:47 - 09:56
(1.7) SARCOPENIA IS AN INDEPENDENT RISK FACTOR FOR SUBSEQUENT OSTEOPOROTIC VERTEBRAL FRACTURES AFTER PERCUTANEOUS CEMENT AUGMENTATION.
Lidar S, Chua M, Khashan M, Ophir D, Salame K, Lidar Z, Regev G.

09:57 - 10:06
(1.8) SPINE TRAUMA IN OCTOGENARIAN PATIENTS
Bineth N, Kaplan L, Sagiv S, Shear-Yashuv H, Schroeder J.

10:07 - 10:16
(1.9) ADVERSE EVENTS ASSOCIATED WITH PERCUTANEOUS PMMA AUGMENTED FENESTRATED PEDICLE SCREW INSTRUMENTATION OF THORACOLUMBAR SPINE FRACTURES.
Rod A, Shani A, Rahamimov N.

SCIENTIFIC PROGRAM

10:17 - 10:26

(1.10) TWO DIFFERENT CARCINOMAS IN ONE SINGLE VERTEBRA CAUSING A PATHOLOGICAL FRACTURE.

Lotan R, Klatzkin L, Vaknine H, Hershkovich O.

10:27 - 10:36

(1.11) PREDICTORS OF SACRAL ULCERS IN PATIENTS WITH COMPLETE SPINAL CORD INJURY.

Crawford E, Balasubramanian P, Wasim A, Stark R, Shrikumar M, Chen T, Anthony T, Philips A, Nathens A, Chapman M, Larouche J, Schwartz C, Finkelstein J.

10:37 - 10:47

DISCUSSION

10:48 - 11:18

COFFEE BREAK

SESSION 2: DEFORMITY

Moderators: Orr D, Anekstein Y.

11:19 - 11:39

WHAT SPINAL MEASUREMENTS REALLY MATTER.

Orr D.

11:40 - 11:49

(2.1) A MODIFICATION TO A STANDARD SURGICAL TECHNIQUE IN LUMBAR FUSION, SHOWS IMPROVED LORDOTIC CORRECTION.

Menachem S, Seex K.

11:50 - 11:59

(2.2) SCOLIOSIS IN OSTEOGENESIS IMPERFECTA: RESULTS OF POSTERIOR SPINAL FUSION IN 39 PATIENTS.

Rabau O, Essa A, Smorgick Y, Anekstein Y, Abhishek K, Neil S, Jean A.O.

12:00 - 12:09

(2.3) NON-FUSION SCOLIOSIS CORRECTION SURGERY IN THE GROWING NEUROMUSCULAR SPINE – A CALL FOR CAUTION.

Schroeder J.E, Kaplan L, Eylon S, Frankl M.

12:10 - 12:19

(2.4) THE EFFECT OF INTRAVENOUS DEXMEDETOMIDINE ON THE STABILITY OF NEUROMONITORING DURING ADOLESCENT IDIOPATHIC SCOLIOSIS SURGERY.

Abdiyev D, Arzi H, Haouzi F, Nahtomi-Shick O, Michaeli A, Korn A, Sarhan M.A, Barzilay Y.

12:20 - 12:40

ROLE OF LIMITED SURGERY IN ADULT DEFORMITY

Orr D.

SESSION 3: COVID

Moderators: Ohana N, Keren A.

12:41 - 12:50

(3.1) THE IMPACT OF COVID-19 ON EMERGENCY VISITS FOR BACK AND NECK PAIN

Baruch Y, Engel I, Benharroch D, Sheinis D, Ohana N.

12:51 - 13:18

DEBATE: ZOOM CLINIC MEETING: A BLESSING OR A CURSE?

PRO ZOOM MEETINGS

R. Lotan

CON ZOOM MEETINGS

Y. Baruch

13:19 - 14:19

LUNCH BREAK

SESSION 4: MIS

Moderators: Deutch H, Harel R.

14:20 - 14:40

MINIMALLY INVASIVE POSTERIOR CERVICAL FUSION RESULTS

Deutch H.

14:41 - 14:50

(4.1) RESECTION OF BENIGN VERTEBRAL TUMORS BY TUBULAR MINIMALLY INVASIVE TECHNIQUE

Salame K, Regev G, Khashan M, Ofir D, Lidar Z.

SCIENTIFIC PROGRAM

14:51 - 15:00

(4.2) INCIDENTAL DUROTOMY DURING MINIMALLY INVASIVE SPINE SURGERY: RISK FACTORS AND COMPLICATIONS

Kimchi G, Shiber M, Knoller N, Harel R.

15:01 - 15:21

MINIMALLY INVASIVE LUMBAR FUSION. EVALUATION OF OUR TECHNIQUE OVER TIME.

Deutch H.

15:22 - 15:42

A SCEPTICS VIEW OF MIS SURGERY

Orr D.

15:43 - 15:53

DISCUSSION

15:54 - 16:24

COFFEE BREAK

SESSION 5: TECHNOLOGY

Moderators: Barzilay Y, Keynan O.

16:25 - 16:34

(5.1) REGENERATION OF DAMAGED INTERVERTEBRAL DISC BY THE RECOMBINANT HUMAN AMELOGENIN rHAM+

Shabtai R, Markowitz S, Nevo H, Blumenfeld A, Schroeder J, Haze A.

16:35 - 16:44

(5.2) A FIRST-IN-HUMAN, PROSPECTIVE STUDY EVALUATING THE SAFETY AND PERFORMANCE OF A NOVEL COMPUTER-AIDED INTRA-OPERATIVE GUIDANCE SYSTEM BASED ON PLAIN X-RAYS IN MINIMALLY-INVASIVE SPINAL STABILIZATION SURGERY

Hadad E, Vider S, Keynan O.

16:45 - 16:54

(5.3) RADIATION FREE NAVIGATION FOR SPINE SURGERY- A CADAVERIC STUDY

Schroeder J.E, Kaplan L, Matz B, Vaacaro A, Patel T.

16:55 - 17:22

DEBATE: HOW SHOULD WE ADOPT NEW TECHNOLOGY

PRO EARLY ADOPTION

Gilad R.

CON LATE ADOPTION

Ophir I.

FRIDAY

8TH APRIL 2022

SESSION 6: CERVICAL

Moderators: Itschayek E, Regev G.

08:30 - 08:39

(6.1) THE ROLE OF NEUROPHYSIOLOGICAL MONITORING DURING PATIENT POSITIONING IN CERVICAL SPINE PROCEDURES.

Sapirstein E, Zarchi O, Felzensztein D, Jackson S, Kogan D, Hasharoni A, Davidovich S, Abushkara R, Harnof S, Itshayek E.

08:40 - 08:49

(6.2) POST-OPERATIVE DYSPHAGIA FOLLOWING VENTRAL CERVICAL APPROACH: COMPLICATION OR SIDE-EFFECT?

Kimchi G, Michaeli N, Nulman M, Knoller N, Maimon T, Harel R.

08:50 - 08:59

(6.3) HYBRID SURGERY FOR THE TREATMENT OF CERVICAL MYELOPATHY AND ADJACENT LEVEL RADICULOPATHY.

Felzensztein D, Sapirstein E, Jackson S, Kogan D, Hasharoni A, Davidovich S, Abushkara R, Harnof S, Itshayek E.

09:00 - 09:20

(6.4) ACUTE AIRWAY COMPROMISE FOLLOWING ANTERIOR CERVICAL DECOMPRESSION AND FUSION: INSTITUTIONAL REVIEW AND REFINED MANAGEMENT ALGORITHM.

Kimchi G, Michaeli N, Nulman M, Knoller N, Harel R.

SCIENTIFIC PROGRAM

09:21 - 09:30

(6.5) ULTRA-SOUND GUIDED CERVICAL RETROLAMINAR BLOCK FOR CERVICAL RADICULAR PAIN, A FIRST RETROSPECTIVE, COMPARATIVE ANALYSIS.

Khashan M, De Santiago J, Pardo I, Regev G, Ophir D, Salame K, Lidar Z, Brill S, Hochberg U.

09:31 - 09:51

(6.6) ANTERIOR CERVICAL APPROACH: IS IT SAFE FOR THE GERIATRIC POPULATION?

Kimchi G, Michaeli N, Nulman M, Knoller N, Harel R.

09:52 - 10:02

DISCUSSION

SESSION 7: LUMBAR

Moderators: Rahamimov N, Shpigelman A.

10:03 - 10:23

ENHANCED ANESTHESIA AFTER SURGERY (ERAS) AND REGIONAL BLOCKS IN LUMBAR SPINE SURGERY.

Deutch H.

10:24 - 10:33

(7.1) PROSPECTIVE, RANDOMIZED CONTROLLED STUDY OF LUMBAR FACET REPLACEMENT VS. TLIF FUSION FOR DEGENERATIVE SPONDYLOLISTHESIS: TWO YEAR OUTCOMES.

Anekstein Y, Smorgick Y, Rabau O, Coric D, Nassr A, Welch W, Steinmetz M, Mirovsky Y.

10:34 - 10:43

(7.2) PREDICTORS OF FUNCTIONAL RECOVERY FOLLOWING SURGERY FOR DROP FOOT DUE TO DEGENERATIVE LUMBAR DISEASE.

Berger A, Mangel L, Basal S, Lidar Z, Regev G, Khashan M, Ofir D, Salame K.

10:44 - 10:53

(7.3) PRELIMINARY RESULTS OF A NOVEL PROSPECTIVE RANDOMIZED PLACEBO CONTROLLED TRIAL OF INTRAOPERATIVE DIRECT QUADRATUS LUMBORUM BLOCK

FOR PAIN CONTROL AFTER LUMBAR SPINE DECOMPRESSION AND FUSION SURGERY.

Grundshtein A, Millgram M, Floman Y, Karayev V, Ashkenazy E.

10:54 - 11:03

(7.4) EXTREME LATERAL INTERBODY FUSION-OUR EXPERIENCE.

Gertzulin M, Keren A, Haymovich L, Dayan A, Behrblak E.

11:04 - 11:13

(7.5) LOW BACK PAIN IN ADOLESCENT RHYTHMIC GYMNASTICS ATHLETES COHORT. A QUESTIONNAIRE MADE STUDY.

Shpigelman A, Vodovozov D, Alexandrovsky V, Sleiman A, Bernfeld B.

11:14 - 11:23

(7.6) POST-LUMBAR LAMINECTOMY ARACHNOIDITIS

Mansour A, Behrblak E, Haimovich L, Keren A.

11:24 - 11:34

DISCUSSION

11:35 - 12:10

LUNCH BREAK

12:10 - 13:10

BUSINESS MEETING AND ELECTIONS

**ENJOYABLE
WEEKEND
&
SEE YOU ALL
NEXT YEAR.**

SHORT SEGMENT FIXATION, LONG SEGMENT FIXATION OR NO FIXATION FOR THORACOLUMBAR EXTENSION TYPE FRACTURES IN PATIENTS WITH SPINAL ANKYLOSING DISORDERS. OUR EXPERIENCE.

BARKAY G, APTERMAN S, ACKSHOTA N, SHTEWE A, FRIEDLANDER A.

BACKGROUND

Trauma patients with spinal ankylosing disorders (SAD) presenting with extension type thoracolumbar vertebral fractures pose a unique challenge for the spine surgeon.

Although these injuries encompass several different patterns and severities, recommendations and guidelines have advocated aggressive surgical treatment with long segment fixation in this patient population with few authors deliberating the treatment of specific fracture types.

In this study we aim to draw conclusions from our experience of treating this patient population with regards to the different fracture patterns of this entity and the surgical treatment which suits them.

METHODS

We prospectively collected data for all patients diagnosed with thoracolumbar extension type fractures at our department. Computed tomography (CT) exams of the patients were evaluated, and fracture pattern as well as treatment method was assessed. Patients with multiple thoracolumbar fractures and patients with previous spinal instrumentation were excluded from this study.

RESULTS

A total of 106 patients were diagnosed with extension type thoracolumbar fractures at our institution between 2015-2021 and met the inclusion criteria. Of these, 82 were treated surgically, 3 conservatively, 4 patients had a late diagnosis

and were left to conservative treatment, 10 patients were not treated due to their medical state and 7 refused surgical treatment.

When analyzing surgeon preferences- short segment fixation was the surgical treatment chosen in 33 patients and long segment fixation in 49. Inclusion of the fracture level was performed in 63% of patients. Short segment fixation was chosen for patients with an anterior tension band distraction of more than 10 mm in only 2 cases and in patients with obvious posterior element involvement on CT in 4 cases.

Follow up studies were available for 60% of the patients (21 short segment and 28 long segment fixation) with 1 failure in the short segment group and 2 failures in the long segment group on follow up.

Magnetic resonance imaging was performed in 27 patients. Of these, 3 were treated conservatively.

CONCLUSIONS

Short segment fixation may be considered for SAD patients presenting with thoracolumbar extension type fractures with no obvious involvement of the posterior elements and an anterior tension band distraction of less than 10 mm. In these patients, fixation of the fractured vertebra should be performed if possible.

DO ALL FRACTURES IN THE ANKYLOTIC SPINE REQUIRE SURGICAL FIXATION?

STAVSKY M, SHARABANI A, HAMED A, SARHAN M, ARZI H, BARZILAY Y.

Spine unit, Department of Orthopedic Surgery, Shaare Zedek Medical Center and faculty of medicine, Hebrew university, Jerusalem, Israel.

INTRODUCTION

Fractures involving the ankylotic spine are considered unstable. Patients are kept bed ridden until the fracture is surgically fixed. These patients are frequently old and fragile and are prone to complicate. The aim of this study was to identify a subset of patients with fractures involving the ankylotic spine who do not require surgical intervention.

STUDY DESIGN

Retrospective analysis.

PATIENTS AND METHODS

Between 01.01.2014 and 31.11.2021 all patients hospitalized with fracture of the vertebral column were identified using ICD coding and screened for fractures involving the ankylotic spine. Extension type injuries in patients with DISH, not involving the posterior elements of the spine, comprised the study group. Initial screening resulted in 1057 hospitalized patients with trauma to the vertebral column. Of these, 497 were hospitalized for fractures in the thoraco-lumbar spine. Of the 497 patients, 13 patients (9F: 4M) were hospitalized for extension type injuries in patients with DISH who did not extend to the posterior elements on a thin sliced CT scan. One patient was hospitalized twice, for two separate extension type injuries. Mean patients' age was 82 years (range 67-91), falling backwards was the most common mechanism of injury (12/14 fractures) followed by 1 pedestrian MVA resulting in falling back and one unknown mechanism of injury. Hypertension was present in 11 of 13 patients.

All patients were treated non operatively, TLSO braces were prescribed to patients who could tolerate them. All patients were mobilization

freely. The only limitation was keeping the bed inclined to 20-30 degrees to prevent further extension of the fracture site, thus approximating the fractured segments, and reducing pain.

Follow up in the spine clinic ranged from 1 month to 72 months, telephone interview of the patient or his family were conducted for missing data.

RESULTS

All fracture healed uneventfully, no patient required late surgical intervention and no neurological complications were noted. Two patients died in the months following the fracture from other reasons.

DISCUSSION

The literature supports surgical fixation of fractures in the ankylotic spine. However, extension type injuries in patient with DISH, not involving the posterior elements, comprise a special subgroup that can be treated non operatively with high success rates, avoiding the complications of surgical intervention in this fragile group of patients. A prospective randomized trial may prove the benefit of this approach compared to surgical fixation of these fractures.

THE ASSOCIATION BETWEEN VERTEBRAL BODY HOUNSFIELD UNITS AND PROGRESSIVE COLLAPSE OF ACUTE OSTEOPOROTIC COMPRESSION SPINAL FRACTURES.

SMORGICK Y¹, KALVEG-PELED R^{2,4}, TAL S³, RABAU O¹, ANEKSTEIN Y¹, MIROVSKY Y¹, MAY H^{4,5}.

1. Department of Orthopedic Surgery and the Spine Unit, Shamir (Assaf Harofeh) Medical Center, Zerifin, Israel, affiliated to the Sackler Faculty of Medicine, Tel-Aviv University.
2. Department of Physical Therapy, Zefat Academic College, Zefat.
3. Department of Radiology, Shamir (Assaf Harofeh) Medical Center, Zerifin, Israel, affiliated to the Sackler Faculty of Medicine, Tel-Aviv University.
4. Department of Anatomy and Anthropology, Sackler Faculty of Medicine, Tel Aviv University
5. Dan David Center for Human Evolution and Biohistory Research, Sackler Faculty of Medicine, Tel Aviv University.

INTRODUCTION

Osteoporosis is characterized by reduction of bone mass and alteration of bone architecture resulting in increased bone fragility and increased fracture risk. There are no studies which evaluate the impact of bone mineral density (BMD) on the type of new osteoporotic spinal fracture and the relation between BMD and progressive collapse of acute osteoporotic spinal fractures. It has been shown that Hounsfield units (HU) measurements obtained from computed tomography (CT) can predict BMD.

The aims of this study were to reveal whether there are significant differences in vertebral body bone density (measured in HU) between the various types of vertebral fractures and to examine whether the vertebral body bone density (in HU) is associated with the initial and progressive collapse of the vertebral body following acute osteoporotic compression spine fractures

MATERIAL AND METHODS

The study included 128 patients with acute osteoporotic compression spine fractures who underwent a CT scan between the years 2008 and 2013. Out of which, 41 were males and 87 females and all patients were over 50 years.

The vertebral body fracture was classified according to the AOSpine Thoracolumbar Spine Injury Classification System. Characteristics of the vertebral body of the fractured vertebrae and the adjacent vertebrae included: vertebral body height, relative vertebral body height loss of the fractured vertebra, vertebral body density. All measurements were obtained from CT scans carried out at diagnosis and x-rays in the follow-up examination (at least three months later).

The density measurement was done by creating a circular region of interest (ROI) with radius of 1 cm was positioned at mid-axial plane of each vertebral body at the inferior part of the pedicle (to avoid the compressed vertebra part). The ROI encapsulated only cancellous bone, avoiding cortical edges, osseous abnormalities, and voids.

RESULTS

The severity of the fracture was found to be age dependent (Mild type A1, A2 compared to Severe type A3 and A4). In the mild type deterioration of the collapse over time was significantly lower compared to the severe type (16.86 ± 11.196 vs. 24.26 ± 13.022 , respectively).

Density of the fractured vertebrae (mean= 160.5 ; SD= 49.00) was significantly higher compared to that of the vertebra above (mean= 108.7 ;

SD=42.71, $p<0.01$) or below (mean=96.6; SD=39.54). Significant positive association was found between vertebral body density and the relative collapse only at the time of diagnosis ($r=0.330$, $p<0.01$).

Density of the fracture vertebra was correlate with progressive collapse in severe type (A3, A4) fractures

We did not find a statistically significant association between the density of the vertebra above or below the fractured vertebra to the initial or progressive collapse of the fractured vertebra.

CONCLUSION

BMD does not influence progressive collapse of the fractured vertebrae. Age, density of the fractured vertebra and the AOSpine Thoracolumbar Spine Injury Classification System were predictive factors for progressive collapse.

BONE SCAN AS A DIAGNOSTIC TOOL FOR DIAGNOSING VERTEBRAL COMPRESSION FRACTURES.

HAJ S¹, ROD A¹, WEINER-KALISH D³, ARNON-SHELEG E^{2,3}, RAHAMIMOV N^{1,3}.

1. Departments of Orthopedics B and Spine Surgery
2. Nuclear Medicine and Diagnostic Radiology, Galilee Medical Center, Nahariya, Israel
3. Azrieli Faculty of Medicine, Bar Ilan University, Safed, Israel

BACKGROUND

The diagnosis of vertebral compression fractures (VCF) is usually based on spine radiographs and Computed Tomography (CT) but they may not be able to differentiate between acute and old fractures, a crucial treatment decision parameter. Magnetic Resonance Imaging (MRI) is the method of choice for determining the fracture's age but is not used routinely because of its higher costs and lower availability.

Bone scan is a relatively available and low-cost method. It has a higher sensitivity for VCF than conventional radiographs and can demonstrate the amount of osteogenic activity in the fracture, which will change according to the fracture's age.

Our study hypothesis was that bone scan will provide us with information regarding the fracture age, eliminating the need for magnetic resonance imaging.

METHODS

A retrospective study was conducted using data from our hospital electronic health records. Included were 180 consecutive patients admitted to the Galilee Medical Center with a suspected acute VCF who underwent thoraco-lumbar spine CT scanning and triple phase bone scan with Single Photon Computed Tomography (SPECT) of the whole spine during the hospitalization period.

RESULTS

Overall, 120 women and 60 men were included (mean age 74.2 years). 13 were excluded because of missing data. 2,417 (94.0%) vertebrae had no evidence of fresh fracture on bone scan and CT. 161 (6.3%) fresh VCFs were diagnosed in both CT and bone scan.

27 (16.2%) patients had fresh VCFs on the bone scan while CT was normal. 37 (22.1%) patients had fresh VCFs on the CT while the bone scan was negative or with low uptake.

CONCLUSIONS

The combination of CT and bone scanning is an effective tool for evaluating vertebral fractures to determine: 1. If a fracture found on CT is fresh or not 2.

EARLY SURGERY FOR THORACOLUMBAR EXTENSION TYPE FRACTURES IN GERIATRIC PATIENTS WITH SPINAL ANKYLOSING DISORDERS DECREASES PERIOPERATIVE PATIENT COMPLICATIONS AND SIX MONTH MORTALITY.

BARKAY G, APTERMAN S, SISSMAN E, SHTEWE A, FRIEDLANDER A, ACKSHOTAN

BACKGROUND CONTEXT

The treatment of patients with spinal ankylosing disorders (SAD) continues to pose a unique challenge for the practitioner. This population is especially susceptible to vertebral column fractures, specifically unstable extension type fractures even from minor trauma. An increase in geriatric patients with unstable extension type vertebral fractures may be especially anticipated due to change in patient demographics including an increase in age and prevalence of associated comorbidities. In the geriatric population, studies have shown that early surgery for other injuries such as hip fractures may reduce patient complications and mortality. These studies have changed patient care protocols in many medical centers worldwide.

In this study, we aim to assess the relationship between the timing of surgery for vertebral fractures in this population and patient complications, rehospitalization rates, length of hospital stays and mortality.

METHODS

We searched our department's database for all SAD patients diagnosed with isolated thoracolumbar extension type fractures that underwent surgery. Patients included were those over 65 years old, following minor trauma and with no additional injuries or neurological deficit. Difference in patient outcomes that underwent early surgery of less than 72 hours from diagnosis as opposed to those that underwent later surgery was assessed.

RESULTS

A total of 86 patients underwent surgery following a diagnosis of an extension type thoracolumbar fracture at our institution between 2015-2021. Of these, 48 met the inclusion criteria for this study. 20 patients underwent surgery less than 72 hours from diagnosis and 28 more than 72 hours from diagnosis. No difference was found in age and Elixhauser comorbidity scores between the groups.

A statistically significant difference in perioperative patient complications between the early and the late groups ($p=0.001$) was found.

Mortality at six-months was found significantly different between the groups as well ($p=0.041$).

There was no statistically significant difference between the groups when comparing surgical site infections, length of hospital stay, rehospitalization within a month and perioperative mortality.

CONCLUSIONS

Time to surgery affects complication rates and six-month mortality in patients of the elderly population with spinal ankylosing disorders presenting with an isolated unstable hyperextension type thoracolumbar fracture. Early surgery in this patient population is recommended.

PERCUTANEOUS SACROPLASTY FOR SACRAL INSUFFICIENCY FRACTURES, A SAFE PROCEDURE WITH GOOD CLINICAL OUTCOMES – A RETROSPECTIVE STUDY.

QUESADA JIMENEZ R¹, SCHROEDER J.E¹, KAPLAN L¹, YESHUV H.S¹, COHEN J².

1. Department of Orthopedic Surgery, Hebrew University Hadassah Medical Center, Kalman Ya'akov Man St Jerusalem, Israel
2. Department of Neurosurgery, Hebrew University Hadassah Medical Center, Kalman Ya'akov Man St Jerusalem, Israel

Sacral insufficiency fractures, represent a well know entity, that increase incidence year by year, affecting the elderly population with osteoporosis and oncology patients causing severe low back pain and immobilization in this fragile population.

On the current practice, these patients represent a real challenge, with no short term resolution in term of pain and mobility.

We assess the sacroplasty as a safety, effective percutaneous procedure for this type of fractures.

METHODS

We performed a retrospective review of our databases for percutaneous sacroplasty, performed between October 2018 and April 2021.

Demographic, etiology, Visual Analog Scale pre and post procedure, days of hospitalization, ability of ambulate after procedure and radiological outcome were collected.

RESULTS

Fifty-six patients were operated between, October 2018 and April 2021, 47 (83.9%) were female and 11 (16.07) males. The average age was 78.25 years old (55-96).

20 (35.7%) oncology patients 36 (64.28%) osteoporotic related fractures.

The mean VAS score pre procedure was 8.92

(range from 6 to 10), at two weeks follow up post procedure, the mean VAS was 1.35, (range from 1 to 4), There were statistically significant decreases in the Visual Analog Scale, ($p=0.0015$)

There was no neurological complication for any of the patients. One patient presented mechanical failure, that underwent sacral fixation surgery two weeks after the sacroplasty. All patients were discharged ambulating, with an average of hospitalization days of 2,8 (1 to 17 days), with an average release time after procedure of 8H.

CONCLUSIONS

Percutaneous Sacroplasty is a safe, and an effective procedure providing in a short term of time, pain relief, decrease in the amount of pain medications, and increase mobility for sacral insufficiency fractures. With an average short hospitalization rate.

SARCOPENIA IS AN INDEPENDENT RISK FACTOR FOR SUBSEQUENT OSTEOPOROTIC VERTEBRAL FRACTURES AFTER PERCUTANEOUS CEMENT AUGMENTATION.

LIDAR S, CHUA M, KHASHAN M, OPHIR D, SALAME K, LIDAR Z, REGEV G.

STUDY DESIGN

Introduction: Subsequent osteoporotic vertebral fractures (SOVF) are a serious complication of osteoporosis that can lead to spinal deformity, chronic pain and disability. Several risk factors have been previously identified as risk factors for developing SOVF. However, there are conflicting reports regarding the association between sarcopenia and multiple vertebral compression fractures. As such, the goal of this study was to investigate if sarcopenia is an independent risk factor of SOVF.

METHODS

This was a retrospective case control study of patients who underwent percutaneous vertebral augmentation (PVA) due to VOFs of the thoracolumbar spine in patients with no prior vertebral fractures. Data collected included: age, sex, BMI, steroid treatment, fracture level, presence of kyphosis at the level of the fracture and bone mineral density (BMD). Identification of SVOFs was based on clinical notes and imaging corroborating the presence of a new fracture. Sarcopenia was assessed using the normalized Psoas muscle total cross sectional area (nCSA) at the L4 level was measured.

RESULTS

Eighty nine patients that underwent PVA were followed for a minimum of 24 months. Average age was 80.2 7.1 years, 58 were female (65.2%) and 31 male (34.8%). Psoas nCSA was significantly associated with age ($p=0.031$) but not with gender ($p=0.129$), use of corticosteroids ($p=0.349$), local kyphosis ($p=0.715$), or BMD ($p=0.724$). Sarcopenia was significantly associated with SOVF ($p=0.039$) after controlling for age and gender.

DISCUSSION

Our study establishes sarcopenia as an independent risk factor for subsequent SOVF. Furthermore, we found that the diagnosis of sarcopenia using Psoas CSA from the lumbar spine CT scans can be used as a stand-alone diagnostic tool of sarcopenia in patients undergoing PVA.

SPINE TRAUMA IN OCTOGENARIAN PATIENTS

BINETH N, KAPLAN L, SAGIV S, SHEAR-YASHUV H, SCHROEDER J.

BACKGROUND

Spine trauma is a growing phenomenon, especially in geriatric patients. Traumatic spine injuries are perceived as a major factor in significant morbidity, disability, and mortality. To-date, there is limited information regarding the characteristics of spine trauma in patients 80 year old or older.

METHODS

Comprehensive data regarding all registered octogenarian patients with spinal column injuries, in a Level I trauma center between the years 2015 to 2020 was collected. The extent of traumatic spine injuries in adults over 80, and their consequences was assessed. The gathered information was compared with data of a younger control group (age 19-70), with similar injuries.

RESULTS

125 octogenarians underwent spine trauma between 2015 and 2020 (65F:60M). The average ISS score was 12.65. The most common comorbidity was a head injury in 33% of patients. There were 42 cervical injuries, 21 thoracic injuries, 41 injuries in the thoracolumbar junction and 18 lumbar injuries. There were 13 extension type injuries of the spine. 26% of the patients underwent surgery for the fractures. Mortality rate 9% in the first month increasing to 20% within one year from the trauma. When comparing the octogenarian patients to the younger controls, they demonstrated similar comorbidities, ISS score, hospitalization time and surgical rate, however their mortality rates was significantly higher ($P<0.001$). The highest mortality rate was seen in extension type injuries.

CONCLUSION

Trauma in the octogenarian population is common, with high ISS scores and a high mortality rate. Extension type injuries have the highest rate

of mortality and need to be identified and treated promptly. Further research needs to be extended into this type of population.

ADVERSE EVENTS ASSOCIATED WITH PERCUTANEOUS PMMA AUGMENTED FENESTRATED PEDICLE SCREW INSTRUMENTATION OF THORACOLUMBAR SPINE FRACTURES.

ROD A^{1,2}, SHANI A¹, RAHAMIMOV N^{1,2}.

1. Department of Orthopedics B and Spine Surgery, Galilee Medical Center, Nahariya, Israel.
2. Azrieli Faculty of Medicine, Bar Ilan University, Safed, Israel.

BACKGROUND

Percutaneous pedicle screw instrumentation of thoracolumbar fractures can provide rapid stabilization with minimal soft tissue injury. Obtaining adequate screw purchase is a challenge in vertebrae with poor bone quality or extensive comminution and instability. Bone-screw interface strength can be increased with polymethyl methacrylate (PMMA) augmentation, but concerns for serious adverse events, including PMMA leak and emboli, remain prevalent. We have reviewed our experience using these techniques with fenestrated pedicle screws for complications and adverse events.

METHODS

A retrospective study using data from our hospital electronic health records. Included were consecutive patients admitted over a three year period to the Galilee Medical Center with a thoracolumbar spine fracture and treated with short or long construct percutaneous pedicle screw instrumentation using fenestrated screws (FNS) injected with PMMA. Operative and post-operative complications were collected for all patients.

RESULTS

141 patients were included (mean age 53.5 ±21.0 years, 57.4% males). 175 fractured vertebrae were treated and 377 vertebrae were instrumented with FNS pedicle screws (754 screws) spanning 2 to 8 vertebrae. Mean operative time was 132.7±71.5 minutes. PMMA leakage was observed in 109 screws inserted into an intact vertebra, a

segmental vein leak in 38, leaks into the spinal canal 3. All were asymptomatic. There were no cases of PMMA emboli. The Intraoperative adverse event rate was 6.4% and postoperative adverse events rate was 19.1% including instrumentation failure, misplaced screws and infection. In 13 patients (9.2%) the instrumentation was removed due to local discomfort, reduced lumbar range of motion, hardware failure, infection or for better MR imaging.

CONCLUSIONS

Percutaneous PMMA augmented fenestrated pedicle screw instrumentation of thoracolumbar fractures carries a 25.5% rate of minor adverse events, with 9.2% requiring revision surgery. No major adverse events were found in this case series.

TWO DIFFERENT CARCINOMAS IN ONE SINGLE VERTEBRA CAUSING A PATHOLOGICAL FRACTURE.

LOTAN R, KLATZKIN L, VAKNINE H, HERSHKOVICH O.

BACKGROUND

We report a case of a patient with a T11 pathological fracture. T11 vertebra had been metastasis by two different types of carcinomas: Clear cell renal cell carcinoma and prostatic adenocarcinoma.

To our knowledge, this is the first case ever been reported.

METHODS

A case report of a pathological fracture with the presence of two different carcinomas.

RESULTS

73 years old patient reports three months of lower back pain was admitted to the hospital due to general deterioration, weakness, loss of appetite and B symptoms. On physical examination, no loss of motor function. He undergoes an initial workup which includes Chest Xray. On the chest X-ray, several space-occupying lesions are seen. Upon these findings, he undergoes total body CT. Finding the total body CT includes skeletal metastasis involving the body of the T11 vertebra and a pathological fracture with cord compression. Total body CT also shows a mass at the left kidney (11.5 *10cm) with necrosis at the centre and a thrombus of the left renal vein. The CT also found an enlarged prostate and multiple masses in the lungs, which were suspicious for metastasis. Possible metastasis to the liver (as large as 10*8.5 cm) were also found. Laboratory workup showed: PSA 124, AFP 267, normal LDH and Calcium. Oncological consult could not tell which is the primary tumour as prostate origin due to the high PSA and diffuse skeletal sclerotic metastasis or the RCC due to a left kidney SOL and liver metastasis. The oncologist puts the patient on hormonal therapy for

prostate cancer and requires a biopsy with multiple samples to establish the diagnosis.

Patient underwent angioembolization of the T11 vertebra to decrease intraoperative blood loss than T11 corpectomy and decompression with posterior spinal fusion.

The pathological result showed two types of carcinoma in the same vertebra: Clear cell renal cell carcinoma and Prostatic adenocarcinoma with new bone formation.

CONCLUSION

We report a rare situation never described before.

Two different tumours pose a challenge for treatment both for the oncologist and the surgeon. The surgeon should be prepared for different scenarios during the operation and preplan, as in this case, preoperative embolization to avoid massive bleeding from RCC.

To our knowledge, this is the first case reported of a single vertebra containing two different tumours

PREDICTORS OF SACRAL ULCERS IN PATIENTS WITH COMPLETE SPINAL CORD INJURY.

CRAWFORD E, BALASUBERAMANIAM P, WASIM A, STARK R, SHRIKUMAR M, CHEN T, ANTHONY T, PHILIPS A, NATHENS A, CHAPMAN M, LAROUCHE J, SCHWARTZ C, FINKELSTEIN J.

BACKGROUND

Complete SCI remains a devastating injury, made worse by complications. Sacral ulcers (SU) are frequently reported within this population. Our objective was to identify potential associations with the development of SU. Specifically, we aimed to determine if there was an association between norepinephrine (NE) treatment parameters, when used to achieve mean arterial blood pressure (MAP) targets, and the development of SU. Since NE results in peripheral vasoconstriction, we hypothesized that it may be associated with the SU.

METHODS

Adults with a complete SCI presenting to a level-one trauma-centre from 2014-18 were reviewed retrospectively. Patient and injury variables (age, gender, location of SCI [cervical vs. thoracolumbar], Injury Severity Score [ISS]) and treatment factors (surgery, MAP targets, vasopressor treatment, hospital length of stay [LOS]) were recorded along with the presence/absence of SU during their hospital admission. A multivariable logistic regression analyses was used to determine potential associations with SU.

RESULTS

Eighty-two patients met inclusions criteria. Thirty patients (37%) developed SU. Patient age (Mean: 50.6; SD:21.3), location of SCI (48 cervical, 59%) and ISS (Mean 33.1; SD:11.8) did not differ by the presence of SU. For NE infusion parameters, neither mean rate (6.0mcg/min), nor the mean total duration (204.4 hrs) were associated with the development of SU. Results of the multivariable logistic regression analysis yielded that male gender (OR:34.1; CI95:2.3-506.5, p=0.010) and increased LOS (log-transformed; OR:20.5,

CI95:2.8-149.9, p=0.003) were associated with increased risk of SU, were as having an order for a MAP > 80mmg (OR:0.05; CI95:0.01-0.30, p=0.001) was associated with a reduced risk of SU.

CONCLUSIONS

SU were commonly reported (30/82; 37%) in our study population. NE treatment parameters were not associated with development of SU. The results of this study suggest that efforts should be made to reduce LOS. Future investigations may evaluate the potential of guidelines and care pathways to achieve this goal.

A MODIFICATION TO A STANDARD SURGICAL TECHNIQUE IN LUMBAR FUSION, SHOWS IMPROVED LORDOTIC CORRECTION.

MENACHEM S^{1,2}, SEEX K¹.

1. Department of Clinical Medicine, Faculty of Medicine, Health and Human Sciences, Macquarie University, Sydney, NSW, Australia.

2. Department of Spinal Surgery, Rambam Health Care Campus, Haifa, Israel.

INTRODUCTION

Lumbar lordosis is usually lost in the degenerative process, and when lumbar fusion is required, restoration of the correct shape of the spine is one of the modern metrics of a successful operation. In clinical practice, we have observed difficulties in achieving the desired amount of lordosis at the disc space especially at L4-L5 level, even with the use of a lateral cage, Ponte osteotomies and open screw placement.

Previous papers investigating the technical factors in gaining lordosis during lumbar fusion have principally focused on different procedures and cage size, shape and position.

Study of the anatomy, normal vertebral motion, and current techniques, led to the hypothesis that simply changing direction of compression during surgical fusion, would gain more lordosis.

METHOD

We conducted investigations into the posterior compression phase of lumbar fusion using interbody cages and polyaxial pedicle screws both in the laboratory using a biomechanical Sawbones™ model and clinical studies during spinal fusion.

Method A - whereby caudal screws were locked first and compression proceeded sequentially in a cranial direction prior to locking was compared with Method B - where cranial screws were locked first and compression proceeded caudally. A standard parallel compressor was used. Both methods were repeated to confirm consistent reproducibility, and after increasing levels of

surgical invasiveness; intact, add interbody cage, add inferior facet resection, add Ponte resection.

RESULTS

In the biomechanical study, Method B demonstrated to be consistently superior to Method A, regardless of the type of rod used and for every level of surgical invasiveness performed. (P < 0.001)

Similar results were found in the clinical study where method B was either same (n=2) or better (n=10), with an average of 2.1° more i.e. 54% more (p< 0.015).

CONCLUSION

The „lock top“ technique was more effective at gaining lordosis in both the clinical study and biomechanical study.

A 3D printed model was developed to explain these findings, demonstrating that after facet resection, in compression, tulips move in arcs determined by their distance from their centre of rotation, this differs between superior and inferior tulips.

This motion is prevented, by different amounts, as tulips also have to follow the locked rod.

SCOLIOSIS IN OSTEOGENESIS IMPERFECTA: RESULTS OF POSTERIOR SPINAL FUSION IN 39 PATIENTS.

RABAU O^{1,3}, ESSA A³, SMORGICK Y³, ANEKSTEIN Y³, ABHISHEK K², NEIL S¹, JEAN A.O¹.

1. McGill Scoliosis & Spine Centre, McGill University Health Centre, Montreal, Canada
2. Department of Orthopaedic Surgery, LSU Health Sciences Center, New Orleans, LA, United States.
3. Spine Unit, Department of Orthopedic Surgery, Shamir (Assaf Harofeh) Medical Center, Zerifin, Israel.

OBJECTIVE

The purpose of this series is to evaluate the outcomes of scoliosis corrective surgery in Osteogenesis Imperfecta (OI) patients with primarily pedicles screw fixation in terms of correcting and maintaining the correction of the spinal deformity, and to assess for several perioperative parameters and complications associated with this surgical treatment.

METHODS

Retrospective case series of 39 consecutive patients with OI treated surgically with posterior spinal instrumentation and fusion for scoliosis. The surgeries were performed between 2002 and 2020 by four different surgeons. All patients' medical perioperative and postoperative charts were evaluated. Radiological assessment was performed by evaluation of the preoperative, immediate postoperative and last follow-up plain radiographs.

RESULTS

There were 20 females and 19 males included in this review with a mean age of 14 years (range, 6 – 20 years) at the time of surgery. The median follow-up time was 7.9 years (range, 2.2-17.9 years). The mean pre-operative Cobb angle (CA) of the major curve was 75.2 degrees (SD± 18.2), decreasing to 41.7 (SD± 16.5) in the long-term post-operative follow-up (P < 0.001). A total of 21 adverse events in 16 patients were noted. Only 4 patients required subsequent invasive surgical treatment or prolong hospital stay. All other patients were treated conservatively with no lasting complication.

CONCLUSION

Scoliosis surgical correction in OI patients seem to yield acceptable results, with maintained coronal plane surgical correction in the long-term follow-up. Even though, a high peri-operative complications rate is observed in this series, there were no long-term sequelae or lasting complications.

NON-FUSION SCOLIOSIS CORRECTION SURGERY IN THE GROWING NEUROMUSCULAR SPINE – A CALL FOR CAUTION.

SCHROEDER J.E, KAPLAN L, EYLON S, FRANKL M.

Hadassah Hebrew University medical Center.
Alyn Hospital for Children.

INTRODUCTION

Many of the children with neuromuscular (NM) conditions (SMA, CP, MMC etc) develop scoliosis as they grow. The treatment of scoliosis in these children has been a debatable subject for many years, as quality of life benefits are often hard to quantify, but pulmonary and everyday handling issues such as pressure sores and sitting position are prominent. Use of rigid corsets are of little benefit in delaying the progression of scoliosis in these patients. As the spinal deformity increases, surgery and a young age is often offered with a growing rod construct, which requires proximal and distal fixation but allows continues growth of the spine. However, in these constructs, a central rigid portion is present changing thoracolumbar parameters, changing spinopelvic parameters. A substantial percentage of these children rely on orthotics for ambulation, some of which are based on spinopelvic swing motion, such as reciprocal gait orthotics (RGO), and thus scoliosis correction surgery may influence their ambulation status.

MATERIALS AND METHODS

Clinical data of all children between the ages of 4-15 who underwent spinal fixation with a growing rod construct for NM scoliosis between the years 2010-2019 that came for rehabilitation in a pediatric hospital were reviewed. Surgical, medical and physical therapy charts were collected. Patient ambulation status pre and post op were evaluated.

RESULTS

31 children were operated on for scoliosis with growing constructs between the years 2010 and 2019. The fixations spanned between upper

thoracic and lower lumbar spine. Seven were with MAGEC rods and 24 with growing rod constructs. 26 ambulatory using RGOs or other orthotics. 13 of the 26 children lost the ability to ambulate after the surgery – even though no neurological intraoperative events occurred. The most common reasons for losing ambulation were: loss of lumbar lordosis, which often led to new onset hip and knee contractures, and post-surgery contraindication to RGO use, which led to worsening weakness of core and lower limb strength.

CONCLUSIONS

Correction of the spinal deformity and spinal fixation with a rigid construct that does not account for lumbar lordosis and hip extensor weakness may cause long term loss of ambulation. This important data must be taken into account when choosing timing of surgery and fixation type in such spinal deformities.

THE EFFECT OF INTRAVENOUS DEXMEDETOMIDINE ON THE STABILITY OF NEUROMONITORING DURING ADOLESCENT IDIOPATHIC SCOLIOSIS SURGERY.

ABDIYEV D¹, ARZI H¹, HAOUZI F², NAHTOMI-SHICK O², MICHAELI A³, KORN A³, SARHAN M.A¹, BARZILAY Y¹.

1. Spine Unit, department of Orthopedic Surgery, Shaare Zedek-Hebrew University Medical Center, Jerusalem, Israel
2. Department of Anesthesiology, Shaare Zedek-Hebrew University Medical Center, Jerusalem, Israel
3. Surgical Monitoring Services, 6 Yigal Alon Blvd, Beit Shemesh, Israel 9906206

INTRODUCTION

Corrective adolescent idiopathic scoliosis (AIS) surgery is performed under total intravenous anesthesia (TIVA) and continuous intraoperative neuromonitoring (IOM). TIVA is a combination of intravenous (IV) medications aimed at inducing anesthesia, analgesia, and maintaining stable blood pressures, while allowing stable IOM. Recently, dexmedetomidine (DMED), a drug assisting in analgesia, arterial blood pressure and heart rate control, and reducing post operative vomiting, was introduced into TIVA at our institution. The aim of this audit was to study the effect of IV DMED on IOM stability during AIS surgery.

STUDY DESIGN:

Retrospective analysis

Patients and Methods: Forty-nine AIS surgeries were performed under TIVA+IOM Between 1.2019 and 11.2021. The series consisted of 30 females and 19 males, mean age was 16.2 years (range 11-25), average weight was 59.18 kg STD 16.78 kg. IV DMED was used in 12 cases. Intrathecal DMED was used in 3 of cases. IOM data was available for all cases, and was defines as stable, intermediate, or unstable by 3 different certified neurophysiologists blinded one to each other, who then reached a consensus how to define the IOM. The Chi-square test was used to study the effect of IV DEMD on IOM stability. The Kruskal-Wallis one-way analysis was used to look for a correlation between IV DEMD dose/Kg and IOM stability.

RESULTS

In the 12 patients treated with IV DMED, intraoperative neuromonitoring was unstable in 7 patients, intermediate in 4 and stable in 1 patient, compared to 27 patients with stable IOM, 6 with intermediate IOM and one with unstable IOM in the 34 patients who were not treated with IV DEMD. These differences were highly statistically significant ($P < 0.00$). No correlation was found between IV DEMD dose/kg and IOM stability. Three patients received Intrathecal Morphine + DEMD, in two of them high doses of intrathecal DEMS resulted in intermediate IOM stability and in one case treated with low dose intrathecal DEMD the IOM was stable. These numbers are too small for statistical analysis.

DISCUSSION

In a series of 49 adolescent idiopathic scoliosis corrective surgeries, IV Dexmedetomidine resulted in intermediate to unstable intraoperative neuromonitoring in the vast majority of the cases. These results add to the building knowledge that DMED can have an intruding effect on IOM stability. Intravenous use of dexmedetomidine in AIS surgery should be done under the agreement and understanding of the whole team, and changed if necessary, during the case. The role of intrathecal DMED, in combination with morphine, as augmentation to TIVA should be further studied.

THE IMPACT OF COVID-19 ON EMERGENCY VISITS FOR BACK AND NECK PAIN

BARUCH Y¹, ENGEL I¹, BENHARROCH D², SHEINIS D³, OHANA N¹.

1. Department of Orthopaedic surgery and spine surgery unit, Meir Medical Center, Kfar-Saba, and Faculty of Medicine, TAU, Tel Aviv..
2. Pathology, Soroka University Medical Center, and Faculty of Health Sciences, Ben Gurion University of the Negev, Beer-Sheva, Israel.
3. Spine surgery unit, Soroka University Medical Center, and Faculty of Health Sciences, Ben Gurion University of the Negev, Beer-Sheva.

BACKGROUND

Back or neck pain are among the commonest reasons to sick medical attention in the emergency department (ED). At the beginning of the COVID-19 pandemic and along its course, we saw reduction in the total number of visits to the ER. we assumed that no major change in the ratio of these patients will occur. We therefore conducted this study to assess the rate of visits to the emergency department of our medical center concerning low back or neck pain, as a factor of confinements.

METHODS

The study period was a 30-weeks interval along the COVID-19 pandemic contrasted by a similar stretch in the year preceding the pandemic. The number of visits to the Emergency Department of an 800-bed medical center, prompted by low back or neck pain, was recorded prior and during lockdowns of the COVID-19 pandemic. The significance of confinement for the development of spine pain syndromes was evaluated.

RESULTS

A total of 1530 patients with newly diagnosed low back pain or neck pain patients were enrolled onto this study. Most patients visited our emergency department for low back pain, commonly those older than 60 years. No significant gender variance was disclosed, although most visits of females were for low back pain. Low back pain presentations were curbed following confinement, but the rate of

stays for neck pain swelled by more than 10%. Despite back pain predominance, visits for neck pain persisted. Before the COVID-19 lockdown, the average weekly number of Emergency Department visits was 38.5, this was followed by sharp drops during COVID-19 lockdown (mean different=-22.2, 95%CI=-28.7, -15.7, $p < 0.001$). The trends were not significantly different between the two period (slop difference=0.19, $p=0.17$).

CONCLUSIONS

COVID-19 lockdowns have significant impact on Emergency Department presentations due to back and neck pain in our general hospital. A higher rate of presentation for back pain compared to neck pain is probably related to COVID-19, without being affected directly by the SARS-CoV-2: the confinement-induced immobility might instigate musculoskeletal sequels, but these may also be attributed to stress or other psycho-social afflictions.

RESECTION OF BENIGN VERTEBRAL TUMORS BY TUBULAR MINIMALLY INVASIVE TECHNIQUE

SALAME K, REGEV G, KHASHAN M, OFIR D, LIDAR Z.

BACKGROUND

Benign vertebral tumors consist about 10% of spinal tumors and are rare cause for surgery. Yet, these tumors pose significant management challenges. The goal of this study is to report our experience with resection of benign osseous spine tumors by minimally invasive surgical (MIS) technique utilizing various surgical approaches.

METHODS

A retrospective review of prospectively collected data of patients who underwent minimally invasive surgery for removal of benign osseous vertebral tumors. Demographic, clinical and radiographic features were summarized. Operative time, blood loss, complications, hospital length of stay and final pathological reports were also recorded. Primary outcomes included extent of tumor resection, and pain relief evaluated by VAS for back and leg pain in adult patients and the Wong Baker faces pain rating scale in children under 7 years of age. Secondary outcomes included postoperative instability evaluated by follow up standing scoliosis x-rays and tumor recurrence evaluated by MRI scans.

RESULTS

Between 2013 and 2020, a total of 25 patients underwent MIS removal of primary vertebral tumors. There were 13 males and 12 females (15 adults and 10 children), with mean age of 21.2 (5-68) years. The mean follow-up period was 32 months (6-72). Complete removal of the tumor was achieved in all cases, and was verified by a follow-up MRI scans. There were no procedure-related complications. The average duration of surgery was 70 minutes and the blood loss was less than 35 ml in all cases. The average inpatient length of stay (LOS) was 1.6 (1.5) days. Histopathology revealed osteoid osteoma in 14 patients, osteoblastoma in 8

patients; and fibrous dysplasia, fibroadenoma and eosinophilic granuloma in one case each. Average improvement of the pain scores was from 8 to 1.3.

At the time of this report, no tumor recurrence was evident in all 8 patients and none of the cases developed spinal deformity.

CONCLUSIONS

Our experience suggests that the minimally invasive approach is a valuable option for surgical management of selected patients with primary benign osseous spinal tumors.

INCIDENTAL DUROTOMY DURING MINIMALLY INVASIVE SPINE SURGERY: RISK FACTORS AND COMPLICATIONS

KIMCHI G¹, SHIBER M², KNOLLER N¹, HAREL R¹.

1. Spine Surgery Division, Department of Neurosurgery, Sheba Medical Center, Ramat-Gan, Israel, affiliated to Sackler Medical School, Tel-Aviv University, Israel
2. Adelson School of Medicine, Ariel University, Ariel, Israel

INTRODUCTION

Minimally invasive spine surgery (MISS) rates are increasing worldwide. Overall complications reported with MISS are lower than the complications related to open surgery. Incidental durotomy is reported more frequently with MISS although CSF leak is not frequently reported. Dura closure is manually challenging via tubular retractors. The aim of the current study is to show the durotomy rate during a single surgeon learning curve.

MATERIALS AND METHODS

Following the Institutional Review Board's approval for this study, a retrospective evaluation of imaging studies, patient charts, and operative reports of patients who were operated through a tubular retractor between 2012 to 2019 at a single institution. Durotomy was assessed using the operative reports along with the method used for sural closure and the CSF leak post-operatively. Pre-operative condition was compared to evaluate durotomy risk factors, and neurologic outcome and overall complications were compared using Student t-test and Chi-square test (SPSS 23, IBM, Armonk, NY, USA).

RESULTS

Overall 220 patients were operated during the study duration using MIS tubular retractors. Seventeen incidental durotomies were recorded (8.3%). The durotomy rate dropped from ~10% at the first 3 years of MISS practice to ~5% at the last years. CSF leak was noticed in a single patients, post recurrent laminectomy and foraminotomy at L3-4, L4-5 levels; the leak spontaneously resolved.

Patients' age, numbers of levels, surgical duration, post-operative infection and neurological status were not affected by the durotomy. Ten cases were repaired by using glue only, 1 cases by suture, 3 cases by suture and glue, 2 cases with comertial patch and glue and 1 had spontanuasly resolved during surgery.

CONCLUSION

Incidental durotomy is a frequent complication of MISS. The prevalence of this complication reduces with experience. Usually, Durotomy has no impact on surgical outcome.

REGENERATION OF DAMAGED INTERVERTEBRAL DISC BY THE RECOMBINANT HUMAN AMELOGENIN rHAM+

SHABTAI R^{1*}, MARKOWITZ S^{2*}, NEVO H¹, BLUMENFELD A³, SCHROEDER J¹, HAZE A¹.

1. Orthopaedic Department, Hadassah Hebrew University Medical Center, Jerusalem, Israel

2. Biotechnology, Hebrew University, Jerusalem, Israel

3. Faculty of Dental Medicine, Institute of Dental Science, Hebrew University, Jerusalem, Israel

* Equal contribution

BACKGROUND

Degeneration or injury of the annulus fibrosus of the intervertebral disc (IVD) causes disc protrusion/herniation, which may result in severe pain and neurological deficits. There are currently no treatment modalities, aimed to regenerate the annulus fibrosus, which might lead to prevention of deterioration or recurrence after surgical intervention. The annual healthcare costs for IVD degeneration in the USA total over 90 billion dollars, hence, the importance of developing an effective treatment cannot be overstated. The intervertebral discs form the fibro-cartilaginous joint that lie in between the vertebral bodies and biomechanically function as ligaments, linking the vertebrae together and as a shock absorber, similar to articular cartilage. Previously, we have shown that our recombinant human amelogenin protein (rHAM+) induced significant regeneration of injured/diseased musculoskeletal tissues in vivo, including skeletal ligaments and hyaline cartilage. Hence, we assume that rHAM+ can also regenerate disc herniation.

METHODS

IVD injury was performed in a rat model. Under fluoroscopic guidance, a 1×1 mm defect approximately 0.5 mm deep was created in the tail IVDs Cx 7/8, 8/9, and 9/10 by a 25G needle. Onto each defect 5µl of rHAM+ or propylene glycol alginate (PGA) carrier alone, 7 rats in each group, were applied. Fifteen weeks after the operation, the rats were euthanized and the degree of regeneration was evaluated by MRI scans of the rats' tails using a 7 Tesla scanner and by histological and immunohistochemical stains.

RESULTS

Analysis of the MRI scans using the Pfirrmann classification of the rats IVDs by four blinded orthopedic surgeons showed that there is statistically significant decrease in the severity of IVD degeneration between the rHAM+ and the PGA carrier alone control group (P<0.05).

CONCLUSIONS

The results of this preliminary study showed the potential of amelogenin in regeneration of injured IVDs. Further researches will be required to determine the effective dose and duration required for full regeneration.

A FIRST-IN-HUMAN, PROSPECTIVE STUDY EVALUATING THE SAFETY AND PERFORMANCE OF A NOVEL COMPUTERAIDED INTRA-OPERATIVE GUIDANCE SYSTEM BASED ON PLAIN X-RAYS IN MINIMALLY INVASIVE SPINAL STABILIZATION SURGERY

HADAD E¹, VIDER S², KEYNAN O².

1. Spine Unit, Rambam Health Care Campus

2. Orthopedic Division, Rambam Health Care Campus

BACKGROUND

Thoracolumbar spine stabilization surgery is vastly popular and is increasingly done utilizing minimally invasive (MIS) approaches. These MIS procedures require intra-operative image guidance. The vast majority rely on intra-operative fluoroscopy, while the minority utilize computer-aided imaging technology. The advantage of computer-aided surgery (CAS) is its proven superiority in terms of accuracy of implant placement. The disadvantages are the cost, the need for special tools, and complexity of use.

In this study, we present our experience utilizing a novel computer assisted system that is implemented in software only and works with standard tools. Using real-time image processing, it overlays tools from intra-operative 2D X-Rays on axial and sagittal views generated from a standard pre-operative CT scan. The system requires no on-tool sensors, cameras, reference arrays, or calibrations.

PURPOSE

To evaluate the safety and performance of the "VUZE System" as an aid for planning and performing MIS spine stabilization surgeries.

STUDY DESIGN

First-in-human prospective study.

PATIENT SAMPLE

Male and female subjects aged 18 or older scheduled to undergo a MIS posterior thoracolumbar spinal stabilization procedure, by means of instrumented fixation (pedicle screws), vertebral augmentation, or a combination thereof. Excluded were patients with prior instrumented surgery of the thoracolumbar spine.

OUTCOME MEASURES

Primary outcome measure is the safety of the system as evaluated by the number and rate of Adverse Device Effects (ADEs), reported during the study.

Secondary outcome measure is the performance of the system in terms of accuracy of implant placement as assessed by comparing the virtual probe positions, as displayed by the system on the computer screen, as compared to real-life cross-sections generated from intra-operative 3D scans following implant insertion.

METHODS

Eligible patients were identified, and enrolled in a screening visit up to 4 weeks prior to the surgery and basic demographic data and medical history obtained.

A current CT scan was reviewed to ensure its compliance with system requirements.

Within the 24 hours prior to the surgery – pre-operative planning of implant placement was

performed using the planning software of the system based on the preoperative CT scan of the patient.

During the procedure, the planned surgery was performed according to routine practice for MIS implant insertion, utilizing standard tools and standard fluoroscopy in the AP view only.

Concurrently, the system grabbed the fluoroscopic images from the C-Arm and the software converted each fluoroscopic image to a three-dimensional computer image simulating the position of the tool (guide wire, Jamshidi needle, or screw) within the vertebral body.

Following completion of the implant insertion, verification of implant position within the vertebral body was performed utilizing intraoperative 3D scans.

RESULTS

Five patients were enrolled and underwent MIS surgical stabilization

Three males and two females. Average age 51.

Indications for surgery were degenerative in three, and trauma in two, and included pedicle screw fixation in 4 patients, and kyphoplasty in one patient.

No adverse events were encountered in any patient.

Comparison of simulated implant position as projected by the system, to actual implant position shown on three dimensional imaging, showed an excellent match in all implants.

CONCLUSIONS

The preliminary results of this first-in-human study of a novel CAS system for performing MIS surgery utilizing standard tools and standard AP fluoroscopy show the system is safe and accurate.

Further study, to ensure safety and accuracy of the system on a larger cohort is underway.

RADIATION FREE NAVIGATION FOR SPINE SURGERY- A CADAVERIC STUDY

SCHROEDER J.E¹, KAPLAN L¹, MATZ B², VAACARO A³, PATEL T⁴.

1. Hadassah Hebrew University Medical Center
2. Pathkeeper LTD
3. Rothman Institute, PH, USA
4. Washington DC spine and sport Center, USA

INTRODUCTION

Surgery and spine surgery specifically are using increasing amounts of ionizing radiation in order to allow tracking and navigation during surgery. This increase in harmful radiation increases the risk of cancer for both the patients and the surgical staff. In addition, in cases in which the spine is mobile, the vertebrae move during the case causing decreased accuracy as the case progresses.

In light of these issues, research into optical imaging and navigation has been conducted to allow a radiation-free solution.

MATERIALS AND METHODS

Using a specialized high definition 3D camera, augmented technology for optical imaging and AI software allowing radiation free matching of the preoperative imaging to the real anatomy of a patient, pedicle screws were planned and executed in thoracolumbar in 7 cadavers (both female and male). Real time tracing and imaging was tested in all cases. Screw accuracy was tested by postoperative computed tomography (CT) imaging.

RESULTS

80 pedicle screws were inserted by five surgeons using optical navigation between T2 and L5 vertebrae, using the real-time tracking software. In order to assess real time tracking, during the procedure the cadavers were moved, in addition extensive dissection and osteotomies of spine were performed in order to allow spine motion during procedures. Real time tracking and imaging was tested and successful throughout the cases.

Accuracy rate using system guidance was 100% throughout surgery as well as in postoperative CT verification in all cadavers.

SUMMARY

Optical navigation is an emerging new technology that provides a safe solution for a radiation free spine surgery. As this technology continues to evolve allowing sub-millimeter accuracy and real time imaging, it shall be able to decrease the need of intraoperative CT scans for patients. Live patient testing is needed to translate this promising technology from the bench to the operating room table.

THE ROLE OF NEUROPHYSIOLOGICAL MONITORING DURING PATIENT POSITIONING IN CERVICAL SPINE PROCEDURES.

SAPIRSTEIN E, ZARCHI O, FELZENSZTEIN D, JACKSON S, KOGAN D, HASHARONI A, DAVIDOVICH S, ABUSHKARA R, HARNOF S, ITSHAYEK E.

BACKGROUND

IONM allows intraoperative assessment of spinal cord function through real time feedback from sensory tracts, motor tracts, and nerve roots. IONM assesses functional integrity of the spinal cord and nerve roots, allowing early detection and reversal of neurological deficits. The pattern of signal loss during monitoring is important - sudden signal loss is associated with severe and irreversible injury, gradual degeneration is more likely to represent mild, recoverable damage.

Different evidence exists regarding the sensitivity and specificity regarding the detection of new neurological deficit and current studies show multimodal ION (SSEP, MEP, and EMG) to provide more accurate interpretation of the information acquired.

Positioning during cervical procedures is a potentially damaging manoeuvre that may require an adequate neurophysiological monitoring technique to prevent damage to the spinal cord. IONM can be useful in detection of positioning-related brachial plexopathy during cervical spine surgery and thus, serves as a tool for the prediction of neurological outcome.

Despite advancements in the understanding of IONM and the popularity of this technique in modern spine surgery, controversies still exist regarding its effectiveness and the necessity for its use in routine spinal procedures.

GOAL

To determine the use of IONM during positioning in cervical spine surgery and to assess the usefulness of head repositioning to restore the potentials, and the effect on neurological outcome.

METHODS

We retrospectively reviewed prospective collected data from 2017 and currently going. All patients undergone cervical spine surgery with neuromonitoring at Rabin medical center Beilinson hospital from 2017 till current were included. Demographic data, medical history, findings at neurological examination and imaging, electrophysiological data recorded during surgery, and neurological outcomes were collected and analyzed.

RESULTS

Five hundred and one patients met inclusion criteria. Loss of potentials detected in twenty patients during patient positioning and repositioning was performed with the aim of restoring electrophysiological signals. In 15/20 patients, repositioning resulted in immediate restoring of the baseline potentials. In 5/20, repositioning did not immediately restore electrophysiological signals out of those 5, in 1/4 potentials reappeared later during the decompression and in 3/4 potentials had not recovered till the conclusion of surgery.

CONCLUSIONS

According to the above data we believe that multimodal IONM is a useful method to prevent spinal cord injury during neck positioning in cervical spine surgical procedures and can be used to reduce the risk of neurological damage caused during patient positioning.

POST-OPERATIVE DYSPHAGIA FOLLOWING VENTRAL CERVICAL APPROACH: COMPLICATION OR SIDE-EFFECT?

KIMCHI G^{1*}, MICHAELI N^{2*}, NULMAN M², KNOLLER N¹, MAIMON T¹, HAREL R¹.

1. Spine Surgery Division, Department of Neurosurgery, Sheba Medical Center, Ramat-Gan, Israel, affiliated to Sackler Medical School, Tel-Aviv University, Israel

2. Sackler Medical School, Tel-Aviv University, Tel-Aviv, Israel

* Equal contribution

BACKGROUND

post-operative dysphagia following ventral cervical procedures is often encountered. Inconsistencies in its definition as either a post-operative complication or as an anticipated transient side-effect exist among studies comparing complication rates following anterior and posterior cervical spine surgeries. The lack of a consensus definition for post-operative dysphagia may impede the ability to accurately compare complication rates following the two approaches.

OBJECTIVE

To ameliorate the clinical decision-making process when debating between an anterior or posterior cervical approach by elucidating whether post-operative dysphagia be regarded as a complication or a transient side effect.

METHODS

A literature review of studies comparing complication rates following anterior and posterior cervical approaches was performed. A stratified complication rate excluding dysphagia was calculated and discussed. A retrospective cohort of patients operated for cervical spondylotic myelopathy in a single institution comprising 665 patients was utilized to analyze complication rates using a uniform definition for dysphagia.

Results: Both the ventral and the dorsal approach groups exhibited comparable neurological improvement rates. Excluding transient dysphagia, the dorsal approach was associated with higher level of overall complications.

CONCLUSIONS

Inconsistencies in the definition of dysphagia following ventral cervical surgery impedes the interpretation of trials comparing posterior and anterior complication rates. A uniform definition for complications and side effects may enhance the validity of medical trials.

HYBRID SURGERY FOR THE TREATMENT OF CERVICAL MYELOPATHY AND ADJACENT LEVEL RADICULOPATHY.

FELZENSZTEIN D, SAPIRSTEIN E, JACKSON S, KOGAN D, HASHARONI A, DAVIDOVICH S, ABUSHKARA R, HARNOF S, ITSHAYEK E.

BACKGROUND

Patients with multilevel degenerative disc disease suffering from cervical myelopathy and adjacent foraminal stenosis, tend to be managed with multilevel anterior cervical discectomy and fusion (ACDF) or cervical laminectomy and fusion. Fusion sparing techniques have been used in an attempt to decrease the number of fused levels. The combination of ACDF and Transvertebral Foraminotomy could reduce the need for adjacent segment fusion, reduce costs and decrease the number of fused levels in such cases. We present our experience and preliminary results with patients undergoing ACDF and skip level transvertebral foraminotomy.

METHODS

We retrospectively evaluated prospectively collected clinical and radiological data from January 2017. Currently a total of 6 patients have been assessed. All procedures included single level ACDF and unilateral transvertebral foraminotomy at an adjacent disc space. The Modified Japanese Orthopedic Association (mJOA) score and Odom's criteria were analyzed. Radiological assessment included the C2-7 Cobb angle and disc height of segments adjacent to the ACDF. Adjacent segment degeneration, which includes disc degeneration, was evaluated. All surgeries were performed at two adjacent segments.

RESULTS

The JOA scores significantly improved. There were no significant differences in the C2-7 Cobb angle and DH of the adjacent segment to ACDF.

CONCLUSION

Combination of ACDF and transvertebral foraminotomy provides a safe and effective method in reducing the number of levels fused with good clinical outcome.

ACUTE AIRWAY COMPROMISE FOLLOWING ANTERIOR CERVICAL DECOMPRESSION AND FUSION: INSTITUTIONAL REVIEW AND REFINED MANAGEMENT ALGORITHM.

KIMCHI G^{1*}, MICHAELI N^{2*}, NULMAN M², KNOLLER N¹, MAIMON T¹, HAREL R¹.

1. Spine Surgery Division, Department of Neurosurgery, Sheba Medical Center, Ramat-Gan, Israel, affiliated to Sackler Medical School, Tel-Aviv University, Israel
2. Sackler Medical School, Tel-Aviv University, Tel-Aviv, Israel

* Equal contribution

BACKGROUND

Anterior approaches to the cervical spine involve soft tissue dissection that may pose a risk for the development of post-operative hematoma and edema, that could lead to acute airway obstruction with fatal outcomes.

OBJECTIVE

To evaluate patients suffering these conditions based on an institutional cohort, and suggest a detailed management algorithm.

METHODS

A retrospective analysis of 1051 patients undergoing cervical spine surgery in Sheba Medical Center between 2012-2019 was performed. 236 patients treated via a posterior approach were excluded, rendering 815 patients operated anteriorly for corpectomy and/or discectomy and fusion. Patients suffering spinal cord injury with respiratory muscles dysfunction were excluded (ASIA A-C). Risk factors for the development of post-operative airway compromise were identified. The acute management following airway obstruction was reviewed and analyzed with a multidisciplinary team comprising anesthesia, ENT and neurosurgery to propose an updated and detailed management algorithm.

RESULTS

The overall rate of acute airway obstruction was 0.49% (n=4/ 815). In 2 patients, an emergent wound opening was performed, followed by immediate endotracheal intubation. In two patients, awake fiber-optic intubation was performed. In 2 patients, the intraoperative findings suggested edema rather than frank hematoma.

CONCLUSIONS

Although rare, the potentially fatal outcomes of acute airway obstruction may be mitigated by early identification and by implementing a structural management algorithm in a timely manner.

ULTRA-SOUND GUIDED CERVICAL RETROLAMINAR BLOCK FOR CERVICAL RADICULAR PAIN, A FIRST RETROSPECTIVE, COMPARATIVE ANALYSIS.

KHASHAN M^{1,2}, DE SANTIAGO J³, PARDO I^{2,4}, REGEV G^{1,2}, OPHIR D^{1,2}, SALAME K^{1,2}, LIDAR Z^{1,2}, BRILL S^{2,5}, HOCHBERG U^{2,5}.

1. Spine Surgery Unit, neurosurgical Department, Tel Aviv Medical Center, Tel Aviv, Israel.
2. Sackler School of Medicine, Tel Aviv University, Tel-Aviv, Israel.
3. Department of Anesthesia and Chronic Pain Unit. Hospital Quirónsalud de Tenerife. Santa Cruz de Tenerife, Spain.
4. Orthopedic division, Tel Aviv Sourasky Medical Center, Israel.
5. Institute of Pain Medicine, Division of Anesthesiology, Tel Aviv Sourasky Medical Center, Israel.

BACKGROUND

Cervical radiculopathy is a common clinical condition, typically treated with conservative measures. Despite its proved effectiveness, cervical epidural steroid injections (ESI) are commonly avoided due to concerns regarding the safety of these procedures.

In this study we evaluated the outcome of RLCB in patients with cervical radicular pain who had failed conservative treatment and were candidates to cervical spine decompression surgery.

Recently, we reported a clinical and cadaver study investigating the treatment of cervical radiculopathy with an ultra-sound guided retrolaminar cervical injection (RLCB).

METHODS

A retrospective, comparative analysis of prospectively collected data was carried out on the medical records of all patients who underwent RLCB for cervical radicular pain between August 2019 to March 2021 at our clinic.

RESULTS

Ninety-eight patients were included in the analysis with a total of 139 procedures.

A significant pain reduction was achieved for most patients immediately after the procedure and at

the final follow up. The mean NRS for the whole cohort changed from 7.21 ± 2.51 to 4.04 ± 2.51 (p -value < 0.01) at the time of discharge, with similar patterns at the subgroup level. Functional evaluation was carried by a questionnaire (neck disability Index - NDI). Overall, 83% of patients had lower post procedural NDI as compared to the pre-procedural NDI. For 80% patients the improvement of NDI surpassed the minimal clinically important change (MCID) at final assessment. Most patients (61%) were discharged after just one RLCB. Eight patients (8%) eventually underwent surgical treatment. No major adverse events were reported, the most frequent complaint being of injection site soreness

CONCLUSIONS

These findings suggest that RLCB can be used as an alternative for ESI and decompressive surgery in patients with radicular pain that is refractory to non-invasive treatment. More comparative and prospective studies are needed to confirm our results.

ANTERIOR CERVICAL APPROACH: IS IT SAFE FOR THE GERIATRIC POPULATION?

KIMCHI G¹, MICHAELI N², NULMAN M², KNOLLER N¹, HAREL R¹.

1. Spine Surgery Division, Department of Neurosurgery, Sheba Medical Center, Ramat-Gan, Israel, affiliated to Sackler Medical School, Tel-Aviv University, Israel
2. Sackler Medical School, Tel-Aviv University, Tel-Aviv, Israel

INTRODUCTION

Cervical spondylotic myelopathy is the most common cause for spinal cord dysfunction and a common cause for cervical spine surgery. As the population ages, the prevalence of myelopathy rises, in conjunction to higher surgical risks in this population. This study aims to examine the complication rates in patients operated via the anterior approach over 75y/o compared to those below 75y/o.

MATERIALS AND METHODS

Following the Institutional Review Board's approval for this study, a retrospective evaluation of imaging studies, patient charts, and operative reports of patients who were operated for cervical spondylotic myelopathy between 2011 to 2019 at a single institution was performed (n=665). Posterior or combined approach patients were excluded. Patients were divided into Geriatric ($\geq 75y/o$) vs. non-geriatric ($< 75y/o$) groups. Post-operative complications were compared between these groups using Student t-test and Chi-square test (SPSS 23, IBM, Armonk, NY, USA).

RESULTS

Overall, 524 patients were included in the general age group vs. 47 patients in the geriatric group. The Geriatric group demonstrated higher rate of elevated ASA score, lower rates of smokers, higher rates of diabetes mellitus, ischemic heart disease and hypertension, and lower rates of kyphotic deformity. The geriatric patients had longer hospitalization, higher rates of DVT, infections and revisions of surgery, and higher percent of discharge to a rehabilitation facility. The risk for complication rose from 7.6% in the non-geriatric group to 16.9% in the geriatric group ($p=0.02$).

Multivariable regression analysis demonstrated the significant risk factors for complications were ASA score ($p < 0.001$) and smoking ($p = 0.03$). Patients' age and all other pre-operative medical conditions were not significant for outcome.

CONCLUSION

The geriatric group had higher levels of surgical complications. Multivariable analysis demonstrated that these complications were significantly related to higher ASA scores and to smoking rather than to the patients' age.

PROSPECTIVE, RANDOMIZED CONTROLLED STUDY OF LUMBAR FACET REPLACEMENT VS. TLIF FUSION FOR DEGENERATIVE SPONDYLOLISTHESIS: TWO YEAR OUTCOMES.

ANEKSTEIN Y¹, SMORGICK Y¹, RABAU O¹, CORIC D², NASSR A³, WELCH W⁴, STEINMETZ M⁵, MIROVSKY Y¹.

1. Spine Unit, Department of Orthopedic Surgery, Shamir (Assaf Harofeh) Medical Center, Zerifin, Israel.
2. Carolinas Neurosurgery & Spine Associates, Charlotte, NC, USA.
3. Mayo Clinic, Rochester, MN, USA.
4. Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA
5. Cleveland Clinic, Cleveland, OH, USA.

BACKGROUND

Lumbar facet replacement by the TOPS prosthesis is a novel motion-preserving procedure that can be used to treat degenerative spondylolisthesis with stenosis. There is an ongoing multicenter, prospective, randomized, controlled US Food and Drug Administration (FDA) Investigation Device Exemption (IDE) trial evaluating the clinical and radiographic outcomes of an investigational facet replacement device (TOPS) versus lumbar decompression, pedicle screws, and transforaminal lumbar interbody fusion (TLIF).

METHODS

This is an interim analysis from the prospective, randomized IDE trial comparing facet replacement (TOPS) and Fusion (TLIF) in the treatment of Grade I degenerative spondylolisthesis and stenosis. The primary clinical outcome measures included percentage of subjects achieving minimum clinically importance difference (MCID) in the Oswestry Disability Index (ODI) and visual analog scale (VAS) for back and leg pain. Radiological assessment included standing and dynamic x-rays, MRI and bone density. Patients were 2:1 randomized to TOPS versus TLIF. A minimum of 24 months follow up was required for inclusion in this study.

RESULTS

At the time of this analysis 249 patients have been enrolled (TOPS =169; TLIF= 80) and a total of 118 patients have reached 24 months of follow-up (TOPS=84, TLIF=34). At 24 months the percentage of subjects reporting minimum 15-point improvement in ODI showed a significant difference (p-value=0.037) between TOPS (94.0%) and TLIF (79.4%). There was no significant difference between groups in the percentage of patients reporting a minimum 20-point improvement on VAS back (TOPS=81.0; TLIF=69.7) and leg pain (TOPS=88.1; TLIF=87.9) scales. Among all 249 subjects that were enrolled the rate of supplemental surgical intervention (SSSI) for facet replacement and TLIF control was 5.9% and 8.8%, respectively.

CONCLUSION

The preliminary results of the TOPS System demonstrate better clinical outcomes at the immediate post-operative visit through 24 months. Re-operation rates are consistent with literature for surgical treatments to address spondylolisthesis with stenosis. Lumbar facet arthroplasty appears to be a viable option for treatment of degenerative spondylolisthesis. Continued enrollment with long-term follow-up is required to validate early findings and evaluate differences between facet arthroplasty and fusion.

PREDICTORS OF FUNCTIONAL RECOVERY FOLLOWING SURGERY FOR DROP FOOT DUE TO DEGENERATIVE LUMBAR DISEASE.

BERGER A, MANGEL L, BASAL S, LIDAR Z, REGEV G, KHASHAN M, OFIR D, SALAME K. Spine Surgery Unit, neurosurgical Department, Tel Aviv Medical Center, Tel Aviv, Israel.

BACKGROUND

Surgery for drop foot secondary to lumbar degenerative disease is not always associated with post-operative functional improvement. It is still unclear whether early decompression results in better functional recovery and how soon surgery should be performed. This study aimed to evaluate predicting factors that affect short and long-term recovery outcomes.

METHODS

We collected demographic, clinical and radiographic data on patients who underwent surgery for drop foot due to lumbar degenerative disease. Clinical data included tibialis anterior muscle strength before and after surgery, duration of preoperative motor weakness and duration of radicular pain until surgery. The tibialis anterior muscle (TAM) strength was recorded at the immediate post-operative period and one month after surgery while long-term follow-up on functional outcomes was obtained at 2 years post-surgery by phone interview.

The degree and duration of preoperative motor weakness as well as the pain intensity and its duration were collected to analyze their impact on short and long-term outcomes.

RESULTS

The majority of patients (70%) showed functional improvement within one month post-surgery and 40% recovered to normal or near normal strength. Univariate analysis revealed a trend towards lower improvement rate in patients with pre-operative weakness of more than 3 weeks (33%), as compared with patients who were operated earlier (76.5%, p=0.034). In multivariate analysis, the only

significant predictor for maximal strength recovery was TAM strength before surgery (OR=6.80 95% CI 1.38-33.42, p=0.018). Maximal recovery by 1 month after surgery was significantly associated with sustained long-term functional improvement (p=0.006).

CONCLUSIONS

Early surgery may improve recovery rate in patients with drop foot caused by lumbar degenerative disease, yet the strongest predictor for the extent of recovery is the severity of preoperative TAM weakness. Maximal recovery in the short-term post-operative period is associated with sustained long-term functional improvement and independence.

PRELIMINARY RESULTS OF A NOVEL PROSPECTIVE RANDOMIZED PLACEBO CONTROLLED TRIAL OF INTRAOPERATIVE DIRECT QUADRATUS LUMBORUM BLOCK FOR PAIN CONTROL AFTER LUMBAR SPINE DECOMPRESSION AND FUSION SURGERY.

GRUNDSHTEIN A, MILLGRAM M, FLOMAN Y, KARAYEV V, ASHKENAZY E.

The Israel Spine Center, Assuta Ramat Ha'hayal, Tel Aviv, Israel.

INTRODUCTION

Pain management can be challenging after lumbar spine posterior decompression and instrumentations surgeries. Use of ultrasound guided Quadratus Lumborum block (QLB) has been proven to be effective in controlling pain and reducing analgesia consumption after a variety of surgical procedures, including in the lumbar spine. We developed a technique for intraoperative direct application of the QLB done by the surgical team with minimal blunt dissection. This study is aimed to assess the safety and efficacy of the QLB.

METHODS

This is a prospective randomized placebo-controlled trial comparing intraoperative QLB with Marcaine and saline mixture (QLB group) versus with saline only (placebo – QLBP group) for patients undergoing primary or revision lumbar spine posterior decompression and instrumentation for degenerative pathologies. The primary endpoint was opioid consumption in the first 24 hours after surgery, and secondary endpoints were time to first documented mobilization and rates of opioid related side effects.

RESULTS

The cohort included 16 patients in the QLB group and 17 in the QLBP group. Demographics were not statistically significant (mean age – 60.8 years vs 50.7, P=0.59, 56% male vs 53% males, P=0.59). The patients underwent fusion of an average 1.6 (QLB) and 1.69 (QLBP) levels – P value of 0.78.

PCA use in the first 24 hours was reduced by 40% in the QLB group (5.43 mg) compared to the QLBP (8.94 mg), however that did not reach statistical significance (P value=0.08). Time to first mobilization was 15 hours compared to 20 hours in the QLBP group (P=0.018). 7% of the patients in the QLB group required a urinary catheter post operatively – compared to 21% in the QLBP group (P=0.23). One patient in the QLBP group suffered from opiate overdose requiring Naloxone during his admission. There were no wound complications or seromas in either group during the hospital stay.

DISCUSSION

Ultrasound guided QLB is a proven method for pain control and opioid consumption reduction after posterior lumbar decompression and fusion. These preliminary results show the use of the direct application of the QLB is safe and effective. Side effects of opioid use were diminished. Further study and bigger numbers are needed to assess effect on postoperative narcotic use, surgical complications and longer term outcomes.

EXTREME LATERAL INTERBODY FUSION OUR EXPERIENCE.

D GERTZULIN M, KEREN A, HAYMOVICH L, DAYAN A, BEHRBLAK E.

INTRODUCTION

Extreme Lateral Interbody Fusion (XLIF) is a relatively new Surgical technique to access the anterior column of the spine from midthoracic to L5 levels with minimally invasive method. Important aspects of the technique are psoas muscle splitting approach the use of advanced neuromonitoring to detect the lumbar plexus within the psoas and large interbody cages which provide correction of both sagittal and coronal planes.

The main complications that may appear in this surgical approach are: major vessels injury, retroperitoneal and intra-abdominal complications such as psoas abscess, bowel perforation and acute pancreatitis has been reported in the recent literature.

Our institution is the leading center in Israel in volume of XLIF procedures. After more than three years of practicing XLIF in our center, we aim to review our experience regarding this technique.

METHODS

Retrospective study of our patients who have had XLIF operation.

We used post- op x-rays to follow adjacent level disease, coronal and sagittal balance and fusion rate. To evaluate satisfaction, we used QOL questionnaires, such as the Oswestry Disability Index and VAS.

We followed the walking capacity improvement, and complications rate.

RESULTS

We reviewed 26 patients. No major complications have occurred. We had 2 POVH needed surgical repair. 2 patients needed revision surgery for hardware relocation. Excellent radiologic outcomes were achieved in 23 patients.

CONCLUSION

According to our experience XLIF is a safe, minimally invasive procedure with good clinical outcomes. High fusion rate and low complication rate are prominent advantages of this procedure. Shortcomings are long learning curve and the fact that complications may cause significant morbidity. Of course, further studies needs to be done in order to compare the success and complications comparing to posterior approaches.

LOW BACK PAIN IN ADOLESCENT RHYTHMIC GYMNASTICS ATHLETES COHORT. A QUESTIONNAIRE MADE STUDY.

SHPIGELMAN A, VODOVOZOV D, ALEXANDROVSKY V, SLEIMAN A, BERNFELD B.

Spine Unit, Carmel Medical Center, Haifa, Israel

BACKGROUND

Low back pain is a common phenomenon prevalent among athletes of different disciplines. Among these, gymnasts are notoriously outstanding, with low back pain effecting over 35% of female gymnasts according to several studies. This study was conducted to examine this claim, and see if there is indeed a connection between participation in gymnastics and experiencing low back pain.

METHOD

A Questionnaire made of 12 questions dealing with low back pain: its occurrence or lack thereof, and its manifestation during day to day activity as well as training routines, was distributed to 85 gymnasts.

RESULTS

Details of the manifestation of low back pain on each of the groups formed, was collected with the forward results: of the gymnasts training for 4 years and less (15) 33.3% had reported suffering from back pain. Gymnasts training between 5-9 years (58) 39.6% had reported suffering from low back pain. while for athletes training for 10 years and more (11) there was 90.9% prevalence of low back pain. In groups divided on the basis of the amount of trainings per week: athletes training 3 times and less (24) 29.16% report low back pain. Of the athletes training 4 times per week (33) 51.5% reported back pain and of the athletes training 5-6 per week (27) 51.85% report low back pain.

POST-LUMBAR LAMINECTOMY ARACHNOIDITIS

MANSOUR A, BEHRBLAK E, HAIMOVICH L, KEREN A.

Orthopedic Surgery Department A, Hillel Yaffe Medical Center, Israel

Spinal nerve root arachnoiditis is caused by an inflammation of the arachnoid membrane which can result from many possible causes such as spinal surgery, myelography, infections, or trauma to the spine

As the inflammation progresses, scar tissue build-up occurs in the arachnoid mater, which causes adhesions to the nerve roots.

Recent studies show that up to 90% of arachnoiditis has been linked to lumbar spine surgery.

Symptoms are usually non-specific, such as a burning sensation in the lower back which radiates down the legs to a non-particular dermatome, burning in the sacral area, knees and feet, as well as neurogenic bladder symptoms.

CASE PRESENTATION

A 72-year-old male with HTN, IHD, and an overactive bladder presented with significant lumbar spinal stenosis and severe neurogenic claudication. He had no lower back pain or signs of radiological lumbar instability.

The patient was operated on due to deterioration in walking capacity and underwent a single-level decompression surgery at L4-L5. During surgery, a dural tear was diagnosed, without any visible CSF leak. After a wide decompression, the tear was repaired with no dural tension.

Three weeks following the surgery the patient was once again admitted to our department due to urosepsis and complaints of bladder and bowel dysfunction. There were no back or lower limb complaints noted.

His physical exam showed no signs of surgical wound infection and an intact lower limb motor exam, however diminished perianal sensation was evident.

During his admission, he underwent a lumbar MRI with contrast that diagnosed acute arachnoiditis.

In consultation with the neurology department, the patient was treated with pentoxifylline and prednisone as well as antibiotics for his UTI.

He was released with a permanent catheter and further evaluation is being conducted by both the orthopedic and the urology departments.

CONCLUSION

Arachnoiditis should always be considered in patients that present bladder dysfunction or atypical symptoms following lumbar decompression surgery, and a thorough evaluation is necessary to rule out this condition. Additionally, early recognition and repair of dural tears are essential to avoid the development of arachnoiditis and its advancement to neurological deterioration.

The 22nd Annual Meeting of the Israel Spine Society



www.spine.org.il