6.1

USING TRANEXAMIC ACID TO REDUCE BLOOD LOSS IN CERVICAL LAMINOPLASTY: A RETROSPECTIVE OBSERVATIONAL STUDY

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Introduction: A number of studies demonstrated that TXA could reduce perioperative blood loss in transfusions in patients undergoing spinal operations. However, most studies were focusing on the lumbar spinal region. There are only limited data focusing on the efficacy of TXA to minimize perioperative blood loss in patients undergoing cervical laminoplasty.

Methodology: Patients underwent cervical laminoplasty between the year 2014 to 2017 were evaluated. Cases with contra-indication to TXA infusion were excluded. Intra-operative and postoperative blood loss, Hb drop, complications such as thromboembolic events were compared.

Results and Analysis: Post-operative blood loss in the TXA group was reduced compared to the control group. The risk of thromboembolic event was not increased in the TXA group.

Discussion and Conclusion: Transexamic acid reduced perioperative blood loss in cervical laminoplasty, and potentially reduces the need of transfusion. It is safe and without major complications.

6.2

IS CERVICAL COLLAR USEFUL AFTER LAMINOPLASTY? - A RANDOMIZED CONTROLLED TRIAL

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Introduction: Cervical collar immobilization is widely adopted after cervical laminoplasty. However, there is currently inadequate evidence of its efficacy in alleviating neck pain, protecting the hinge and preventing spring-back phenomena. We aim to study the effects of cervical collar immobilization on the clinical, radiological and functional outcomes of patients undergoing single-door laminoplasty.

Methodology: We conducted a prospective, parallel and single-blinded randomized controlled trial. Patients who had undergone standardized single-door laminoplasty were randomized by a computer program into the collar group (n=16) and the non-collar group (n=19). The sample size was calculated to achieve a power of >80% with a significance level of 0.05 to detect a minimal VAS difference of 1.5 reported as the minimal clinically important difference (MCID). Outcomes were measured by blinded assessors, including axial neck pain (VAS), canal diameter, cervical range of motion and objective functional scores (SF-36, NDI, mJOA) at various postoperative time intervals. Comparative analysis was performed with multiple covariates adjusted for.

Results and Analysis: There was significant reduction in postoperative axial neck pain, the VAS score being significantly lower in the collar group only at postoperative 1 week (3.5 vs 5.4; p=0.038) and 2 weeks (1.5 vs 3.5; p=0.028), but not subsequently. The cervical canal diameters, ranges of motion and objective scores of the two groups were comparable at various timepoints.

Discussion and Conclusion: Cervical collar after laminoplasty reduces axial neck pain only during the initial postoperative 2 weeks. No additional benefit was found. Hence only temporary use is advisable.

6.3

COMPARISON BETWEEN ROI-C® CAGE, ZERO-P® SPACER AND TRADITIONAL PEEK CAGE IN SINGLE-LEVEL ANTERIOR CERVICAL DISCECTOMY AND FUSION

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Introduction: Anterior cervical discectomy and fusion (ACDF) is regarded as gold-standard for treating cervical disc diseases. Instrumentation provides additional stability comparing with traditional cage and bone graft, that it allows immediate postoperative neck mobilization without extra protection. However, it may increase operative time, radiation exposure and blood loss. The aim of the study is to compare the perioperative details, clinical and radiological outcomes following single-level ACDF by 2 instrumentation methods, ROI-C cage and Zero-P spacer, with traditional polyethylethylketone (PEEK) cage.

Methodology: It was a retrospective case series included 20 male and 9 female patients who underwent single-level ACDF from January 2014 to March 2018 in Alice Ho Miu Ling Nethersole Hospital. Patient demographics, perioperative details, clinical and radiological outcomes were analysed.

Results and Analysis: There were no difference in demographics and preoperative function amongst all 3 groups of patients. There were no difference in operative time, blood loss, length of stay or clinical outcomes between instrumentation and PEEK cage group. However, there was significant decrease in blood loss ($p=0.04$) and length of stay ($p=0.02$) in ROI-C group comparing with Zero-P group. Better alignment correction and lower subsidence rate ($p<0.01$) were observed in instrumentation group, especially ROI-C group.

Discussion and Conclusion: Operative time, blood loss, length of stay and clinical outcomes are comparable between instrumentation and traditional PEEK cage for single-level ACDF. ROI-C cage showed superiority in reducing blood loss, shortening length of stay with better radiological outcome, comparing with Zero-P spacer.

6.4

SURGICAL OUTCOME OF ANTERIOR VERSUS POSTERIOR APPROACH IN THE TREATMENT OF CERVICAL SPONDYLOTIC MYELOPATHY: A PROPENSITY-SCORE-MATCHED ANALYSIS

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6.5

THE PREVALENCE AND IMPACT OF CERVICAL SPINE PATHOLOGIES IN PATIENTS WITH NASOPHARYNGEAL CARCINOMA

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Introduction: Nasopharyngeal carcinoma (NPC) and its treatment can lead to cervical spine pathologies such as metastases, osteoradionecrosis (ORN) and infection. However, the occurrence rate and relationship with the ever-advancing technology of radiation therapy is largely unknown. Furthermore, the timing of diagnosis and outcomes of treatment have not been evaluated. Hence, the aim of this study is to determine the prevalence and impact of cervical spine pathologies in patients with NPC.

Methodology: Cross-sectional study of all newly diagnosed NPC cases from 2007 to 2016 at a tertiary referral oncology and spine centre with minimum 1-year post-treatment follow-up. All cervical spine pathologies, their treatment and outcomes of NPC and cervical spine pathology were determined. Presentation, onset time and correlations of the cervical spine pathology with mortality and risk factors were also analysed.

Results and Analysis: Cervical spine pathologies were seen in 8.9% of 605 verified NPC cases. New onset neck pain was seen in 5.3% of cases, symptomatic cervical spondylosis in 4.8%, cervical spine metastases in 2.5%, 0.8% for local tumour invasion, 0.7% each for cervical ORN and osteomyelitis, and 0.3% for radiculopathy and myelopathy. Cervical spine pathologies were associated with an increased risk (odds ratio of 2.73) in overall mortality. Cervical spine metastases, invasion, osteoradionecrosis and infection were associated with statistically significant higher risk of mortality (p=0.01-0.02).

Discussion and Conclusion: Cervical spine pathologies in NPC patients are heterogenous but not uncommon. Neck pain is prevalent but is often benign. ORN and osteomyelitis of the cervical spine is uncommon but have large clinical implications including higher mortality with subtle presentations.

6.6

TRANSFORAMINAL EPIDURAL STEROID INJECTION FOR LUMBAR LATERAL RECESS STENOSIS: SUBPEDICULAR APPROACH VERSUS KAMBIN'S TRIANGLE APPROACH - A RANDOMISED SINGLE-BLINDED STUDY

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Introduction: Transforaminal Epidural Steroid Injection (TFESI) for lateral recess stenosis for treatment of radicular pain has traditionally been performed using the subpedicular approach. Kambin's Triangle approach was suggested as an alternative method with medications directly delivered into the lateral recess. We would like to look at the differences between these two approaches and see which approach provide better results on our patients.

Methodology: We recruited 48 patients indicated for TFESI for lateral recess spinal stenosis and randomised them into two groups equally, one group using the subpedicular approach and the other using the Kambin's triangle approach. Data including patient's pain severity represented by numerical rating scale at pre-op and 3-weeks post-op was collected. A "successful outcome" was defined as reduction of NRS of >=50%. We then compared the results between both groups using logistic regression and recorded the incidence of complications.

Results and Analysis: 22 patients in Kambin's triangle group and 16 patients in subpedicular group had successful outcome in 3-weeks post-op. Logistic regression showed that Kambin's triangle approach was significantly better (P=0.05) in achieving more successful outcomes while age group and disc level of pathology weren't significant. 2 patients in subpedicular group had nerve prick while none of the patients in Kambin's triangle group suffered from that.

Discussion and Conclusion: Kambin's triangle approach provides better pain relief in patients with lateral recess spinal stenosis and is not associated with higher risk when compared to conventional subpedicular approach.

6.7

MINIMALLY INVASIVE SPINE SURGERY (MISS) IN MANAGEMENT OF SPINAL METASTASIS. IMPACT ON PATIENT REHABILITATION AND HOSPITAL STAY

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Introduction: Spinal metastasis has great impact on patient's quality of life. MISS has the advantage of minimizing surgical trauma, hence better rehabilitation and functional outcome.

Methodology: Thirty-two patients received operation for spinal metastasis in AHNH from 2014. Indications of surgery include neurological compression (19 cases), instability (9 cases) and intractable pain (4 cases). MISS technique was applied in 22 cases, all-MISS in 9 cases (group M), and hybrid in 13 cases (group H). The remaining 10 cases received traditional open surgery (group O). Preoperative symptoms, perioperative and postoperative parameters were compared between open and MISS technique. Risk factors for poor functional outcome were also examined.

Results and Analysis: There was no significant difference in sex, age, severity of metastasis and symptoms among the three groups. Patient received MISS technique (group M,H) started their walking earlier (11.1days Vs 6.3days, p=0.045) had had significantly shorter postoperative stay (LOS) (67days Vs 35days, p=0.019) than those received open surgery (group O). All-MISS patients start walking exercise earlier (4.9days Vs 6.3days) and had shorter LOS (20days Vs 45days) than Hybrid group (both p<0.05). Patients presented with cord compression has significantly longer LOS (69days Vs 27days, P<0.05). Regression analysis showed that both MISS technique and cord compression significantly affected the LOS. Moreover, cord compression and open surgery were independently associated with poor functional outcome with odds ratio 9.4 and 12.2 respectively.

Discussion and Conclusion: MISS technique enhanced recovery of patient with earlier ambulation and shorter postoperative LOS. Prophylactic stabilization can minimize morbidity and enhanced recovery of the patient with spinal metastasis before the set in of paralysis.

6.8

COMPARATIVE STUDY OF OPEN AND MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION (MISTLIF) WITH TWO DIFFERENT PERCUTANEOUS SCREW SYSTEM

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Introduction: Minimally Invasive Spine Surgery (MISS) has the benefit of early recovery but more technically demanding with increased radiation exposure. Newer design of percutaneous screw insertion may improve efficiency of the percutaneous operation. We would like to assess the efficacy of MISTLIF in management of degenerative spine disease, and comparing of two different percutaneous screw insertion methods.

Methodology: Twenty cases of single-level MISTLIF were performed in AHNH since 2016, which were randomly allocated to conventional percutaneous screw insertion requiring exchange of guide pin (Group P) and the one-tool percutaneous screw (Group V). They were comparing with 20 cases of open TLIF during the same period. Demographics and perioperative parameters were compared.

Results and Analysis: There was no difference in demographic, operative time, blood loss, radiation exposure and severity of the preoperative symptom in terms of VAS and ODI between open and MISTLIF groups. Patients receiving MISTLIF have shorter postoperative stay (LOS) (5.6d vs. 15.5d, p=0.0042), they sit out (1.9 vs. 3.7d, p= 0.0000) and start walking earlier (4.8 vs. 2.8d, p= 0.0001). Moreover, the one-tool percutaneous screw has significantly shorter operation time (202min vs. 253min, p=0.0455), shortest LOS (4.9d) and lower radiation exposure (145s vs. 211s, v=0.0248) when compare with conventional percutaneous screw insertion method. There was no breaching of medial pedicle in all cases of MISTLIF.

Discussion and Conclusion: MISTLIF is safe and efficient in management of degenerative spine disease with earlier recovery and shorter LOS. The one-tool percutaneous screw shortens the operative time, LOS and lesser radiation exposure to surgeon and patients.

6.9

THE INFLUENCE OF DEVELOPMENTAL SPINAL STENOSIS ON REOPERATION RISK AT THE ADJACENT SEGMENT AFTER DECOMPRESSION SURGERY FOR LUMBAR SPINAL STENOSIS

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6.10

RADIOGRAPHICAL OUTCOMES FOLLOWING INDIRECT DECOMPRESSION USING LATERAL LUMBAR INTERBODY FUSION WITH MINIMUM 2-YEAR FOLLOW-UP

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Introduction: The purpose of this study was to evaluate morphological changes in the thecal sac on MRI after indirect decompression following lateral lumbar interbody fusion (LLIF) with posterior instrumentation.

Methodology: Consecutive 51 patients treated by LLIF and posterior instrumentation at 68 levels were prospectively included in this study. MRIs were corrected at preoperative, postoperative, 6 months, 1 year and 2 years after surgery, and analyzed to confirm the area of the thecal sac and yellow ligament as well as the anteroposterior diameter of disc bulging. The severity of lumbar spinal stenosis was qualitatively assigned one of 3 grades based on our modified Schizas' classification using T2-weighted axial MRI.

Results and Analysis: Preoperative modified Schizas' classifications A, B and C were observed at 13, 43 and 12 levels, respectively. The morphology had significantly improved at just postoperative (A:36 level, B:28 levels, C:4 levels, $p<0.01$), and further improved at 6 months and 1 year and 2 years after surgery (A:61 levels, B: 7 levels, C:0 levels, $p<0.001$). The cross-sectional area of the thecal sac was also improved at postoperative ($p<0.001$) and 2 years post-surgery ($p<0.001$) form preoperative. The cross-sectional areas of yellow ligament also became significantly smaller at postoperative and 2 years ($p<0.001$) after surgery compared with preoperative. The anteroposterior diameter of disc bulging also significantly decreased over time postoperatively, and the diameters were significantly smaller just after surgery and 2 years ($p<0.001$) compared with preoperative.

Discussion and Conclusion: Indirect lumbar decompression using LLIF provided sufficient radiographical outcomes even in cases with severe thecal sac stenosis.

6.11

EARLY CLINICAL RESULT OF THREE-DIMENSION COMPUTED TOMOGRAPHY (3D CT) NAVIGATED MINIMAL INVASIVE TRANSFORAMINAL LUMBAR INTER-BODY FUSION (MIS-TLIF) FOR LUMBAR SPINAL STENOSIS

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Introduction: Minimal invasive trans-foraminal lumbar inter-body fusion (MIS-TLIF) is an alternative to conventional open technique for treatment of lumbar spinal stenosis. We performed MIS-TLIF under Three-Dimension Computed Tomography (3D CT) navigation with the aim of reducing flouroscopic exposure and improving surgical accuracy. The clinical and radiological results are retrospectively evaluated in this study.

Methodology: Patients with lumbar spinal stenosis treated with 3D CT navigated MIS-TLIF since October 2016 were included. The fluoroscopy time, intra-operative blood loss, duration of recumbency & post-operative drain output were assessed. Pedicle screw position were evaluated by post-operative CT. Clinical results were assessed using VAS and ODI scores post-operatively.

Results and Analysis: A total 10 patients with a mean age of 68.1 years and follow-up period of 12.4 months were recruited. The mean fluoroscopy time was 46.1 seconds and mean intra-operative blood loss was 137.5 ml. The mean post-operative drain output was 25 ml. All patients were able to mobilize out from bed on post-operative day 2. Pedicle screws were completely contained within the pedicle in all cases. All patients had satisfactory pain relief and functional outcome.

Discussion and Conclusion: MIS-TLIF performed under 3D CT navigation is an effective and safe alternative to open technique. However more data are needed to establish the long-term efficacy of this technique.

6.12

RADIATION EXPOSURE AND ACCURACY OF LUMBAR PEDICLE SCREWS INSERTION USING 2D COMPUTERIZED NAVIGATION

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Introduction: The amount of radiation exposure can be significant in spinal instrumentations. In this study, we compare the accuracy and the amount of radiation in lumbar pedicle screws insertion using conventional technique or 2D computerized navigation.

Methodology: For the conventional group, the pedicle screw tract was prepared under antero-posterior(AP) X-rays guidance followed by lateral fluoroscopic view. For the 2D navigation group, a good AP and a lateral fluoroscopic view were sent to the navigation machine. Pedicle screw tract was created under simultaneous AP and lateral views from the navigation machine. The dosage of radiation emitted from the C-arm, the time taken for screw insertion, the patient's demographics and any surgical complications were recorded. CT assessment was performed for screw position.

Results and Analysis: 84 screws were inserted under 2D navigation and 202 screws were inserted using conventional technique. No surgical complication was found in both groups. The mean age of the patients was 60. In the navigation group, there were statistically significant reduction in mean radiation exposure time for each pedicle screw (13.76s vs 30.45s, $P<0.05$) and the mean dosage of radiation emitted from C-arm (cGycm2) (90.02 vs 280.54, $P<0.05$). For those with CT scan available, excellent position of the pedicle screws (Grade A) were observed both groups. No significant difference was found in terms of accuracy.

Discussion and Conclusion: In lumbar pedicle screws insertion, significantly less time and dose of radiation were needed when using 2D computerized navigation technique.

6.13

LUMBAR ARTIFICIAL DISC REPLACEMENT - ONE YEAR EXPERIENCE OF 33 LUMBAR VISCO-ELASTIC DISC REPLACEMENTS IN 22 PATIENTS

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Introduction: Whilst the benefits of cervical artificial disc replacement over anterior cervical discectomy and fusion (ACDF) is well established with preservation of range of motion and more importantly reduced rates of adjacent segment degeneration, lumbar disc replacement has been less well understood. There have been concerns with the failure of the implant and longer term concerns about longevity.

Methodology: From July 2017 to May 2018, 22 Patients (4 female 18 male) with age range 17 to 60 years old are retrospectively reviewed. There were 33 disc prostheses used. 8 patients with one single level disc prosthesis, 10 patients with multi-level disc prostheses and 4 patients with hybrid disc and fusion (ALIF / LLIF) combinations. Patient outcomes were assessed radiologically for implant subsidence, migration and range of motion and subjectively with patient reported outcomes using VAS back and leg pain scores, Oswestry Disability Index and SF-36.

Results and Analysis: All patients reported improvement in VAS, Oswestry and SF-36. There were some complications, one retrograde ejaculation in a 39 year old male after 2 level disc prostheses at L4-5 L5-S1. One 37 year old male with 2 level disc prostheses developed implant subsidence which was treated with vertebroplasty. One 37 year old female patient experienced implant migration which was revised 3.5 months after the index operation.

Discussion and Conclusion: Lumbar artificial disc replacement is a useful alternative to fusion in a select group of younger patients. By preserving motion this will hopefully lead to reduced pathology from adjacent segment disease and the need for subsequent surgeries.

6.14

CHANGES IN SAGITTAL ALIGNMENT IN UPSLOPE OR DOWNSLOPE: AN INSIGHT INTO DYNAMIC SPINAL STENOSIS SYMPTOMATOLOGY

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Introduction: Textbook description of spinal stenosis is worsened symptoms in downslope posture and improved symptoms in upslope posture due to respective extension and flexion movements of the lumbar spine causing changes in spinal canal diameter. However, these dynamic changes and resulting changes in sagittal alignment have not been studied. Hence, the aim of study is to analyze the changes in sagittal alignment with downslope and upslope positions.

Methodology: Ten asymptomatic young adults without back pain, spinal disease or surgery were recruited. Whole body biplanar images were obtained at level ground standing, standing on 20 degrees downslope and 20 degrees upslope using an adjustable slant board. Sagittal alignments were measured and evaluated.

Results and Analysis: The lumbar alignment from L1-L5 did not have significant changes in both downslope and upslope settings. The balancing mechanism in downslope setting were different in each individual but the net outcome was to maintain a balanced spine with little change in global alignment. In contrast, the balancing mechanism in upslope setting favours translation of global alignment forward as evident by increased C2-Hip axis angle, sagittal vertical axis, C2-C7 sagittal vertical axis and sacral slope, which is compensated by decreased thoracic kyphosis.

Discussion and Conclusion: This study suggests that the lumbar lordosis does not change with different postures, but the spine balance is maintained by compensatory mechanisms contributed by all segments including changes in cervical and thoracic alignments.

6.15

SAGITTAL IMBALANCE WITH PI-LL MISMATCH AND STRATEGIES FOR MANAGEMENT

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Introduction: 3 column osteotomies such as pedicle subtraction osteotomies for sagittal imbalance are morbid procedures and are associated with increased blood loss and the need for transfusion. Anterior column realignment ACR is a powerful technique which is less morbid with minimal blood loss. In terms of corrective power ACR when combined with posterior column osteotomies is at least equivalent to or superior to traditional 3 column (pedicle subtraction) osteotomy.

Methodology: This is a retrospective review from December 2014 to June 2018 of 8 Anterior Column Realignment ACR surgeries to correct sagittal imbalance, individual case examples will be discussed. There were 5 patients 1 female 4 male. One patient had 3 combined ACR with posterior column osteotomies at L5-S1 L1-2 and T12-L1 for massive PI-LL mismatch of around 80 degrees.

Results and Analysis: Sagittal Cobb angle correction ranged from 20 degrees to 80 degrees in a patient with 3 combined ACR and posterior column osteotomies. Recorded blood loss ranged from less than 50ml to 1200ml for the one patient with 3 combined ACR and posterior column osteotomies. All patients with neurological deficits reported improvement or disappearance of their symptoms.

Discussion and Conclusion: Anterior Column Realignment (ACR) and ACR combined with posterior column osteotomy is a powerful technique to correct sagittal imbalance. The corrective power is equal or superior to traditional 3 column (pedicle subtraction) osteotomy without the associated co-morbidities and blood loss associated with the latter.

6.16

LUMBAR PEDICLE SUBTRACTION OSTEOTOMY FOR THE TREATMENT OF POSTTRAUMATIC KYPHOSIS IN ELDERLY PATIENTS OLDER THAN 75 YEARS OF AGE

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Introduction: The aim of this study is to assess the outcome and complications in lumbar PSO for treatment of posttraumatic kyphosis specifically in elderly patients older than 75 years of age.

Methodology: Patients older than 75 years of age treated with lumbar PSO for posttraumatic kyphosis from 2009 to 2015 were retrospectively reviewed. Radiological images and medical records at preoperative, postoperative and at final follow-up were retrieved. Statistical analysis was performed with two-tailed Student's t-test.

Results and Analysis: Eight patients with 46-111 months of follow-up were analysed. The average age of the patients operated was 81 years. Mean operation duration was 311 minutes. Average blood loss was 1959ml. Local kyphosis improved from 22.6° to 3.1° ($p<0.001$). Lumbar lordosis improved from 18.2° to 31.2° ($p=0.02$). Two patients encountered dural tear. Three perioperative complications were encountered including wound infection, fast atrial fibrillation and transient unilateral foot drop. One developed late implant loosening. Two died due to causes unrelated to the surgery.

Discussion and Conclusion: Complications in pedicle subtraction osteotomy are common but this operation remains an option of treatment for elderly patients with symptomatic posttraumatic kyphosis.

6.17

THE STUDY OF OPERATIVE WINDOW IN PERFORMING OLIF - FEASIBILITY IN SOUTHERN CHINESE AND COMPARSION BETWEEN MRI AND CT ASSESSMENTS

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Introduction: This is a retrospective study about the operative window for OLIF for patient with both MRI and CT scan available. The sizes of the windows in axial cut and the presence of any intervening structures within the operative windows were assessed.

Methodology: Paired sampled T test was used to compare the mean size of operative windows in CT and MRI imaging. ANOVA method was employed to compare with size of windows in different levels in MRI imaging. Pearson Chi-square test was used to assess any difference in frequency of obstruction free levels among different spinal levels.

Results and Analysis: 247 disc levels were assessed. There was no statistical difference between the CT and MRI measurements for the mean horizontal width of the operative windows for different levels. There was no significant difference with the mean size of operative windows in MRI between different levels (P=0.132). There are difference in frequency of free windows among different levels and statistically significant result was found (value = 40.45, df = 3, p=0.000).

Discussion and Conclusion: There is no significant difference between different levels. However, the actual size could be highly variable in individual patient. MRI alone should be good enough in assessing the operative windows in OLIF. The presence of intervening structure is more common over L3/4 and L4/5 followed by L2/3 and L1/2. The surgeon must consider this factor in their pre-operative planning to avoid iatrogenic injuries.

6.18

EPIDEMIOLOGY AND CLINICAL OUTCOME OF ACUTE TRAUMATIC SPINAL CORD INJURY FROM A LEVEL 1 TRAUMA CENTRE IN HONG KONG

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6.19

A STUDY OF INJURY MECHANISM: TRAUMATIC BILATERAL L4-5 FACET DISLOCATION – CASE REPORT AND LITERATURE REVIEW

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Introduction: Traumatic facet dislocation in the lower lumbar spine are rare, with most cases previously reported to be dislocation of lumbosacral joint (L5-S1). We present a case of young male presenting with bilateral L4-5 traumatic facet dislocation after fall injury. Possible biomechanical pathophysiology were discussed.

Methodology: PubMed was searched using search terms "(L4-5 OR L4-L5) and Traumatic spondylolisthesis OR dislocation OR locked facet OR jumped facet"

Results and Analysis: Four case reports were found in the PubMed English literature.

Discussion and Conclusion: In the four case reports, the injuries were head-on collision motor vehicle accidents. The proposed pathophysiology was an extension-distraction force. The thoracic spine and pelvis were immobilized by seatbelt, while the remaining thoracolumbar spine swung forward by momentum. Our patient fell backwards with his upper back landing onto a metal bar which acted as a fulcrum, the spine above and below was forced backwards by gravity. As a result, the spine was forced into hyperextension, and break at its weakest point. In both scenarios, there were no direct impact force at the dislocation site, rather a hyperextension of spine occurs. Also, we have identified anatomical variants in our case which includes a more coronally aligned facet joints and the presence of L5 spina bifida. We believe that the level of injury is related to anatomical variants, and the L4-5 traumatic facet fracture dislocation and the lumbosacral dislocation should be grouped into the same disease entity.

6.20

SACRAL ALAR ILIAC SCREW INSERTION USING 3D COMPUTERIZED NAVIGATION SYSTEM

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Introduction: SAI screw provided strong fixation to pelvis. The problems of traditional technique using intra-operative fluoroscopy included: higher amount of radiation exposure, difficulty to visualize S1 and S2 foramina, proximity of operative hand to the C-arm. In this article, we described and evaluated the initial result of screw insertion using 3D computerized navigation system.

Methodology: Pre-operative CT scan of the pelvis was performed to determine the diameter, length and location of the screws. Screw pathways were created using navigated instrument under axial, sagittal and coronal CT images after matching between pre-operative and intra-operative CT images. No further fluoroscopy was required until final checking. After the operation, the patient was assessed and CT scan was performed to check the position of screws.

Results and Analysis: From Aug 2017 to Oct 2017, 6 screws were inserted using 3D navigation in 3 patients. The mean age of the patient was 74.3 years old and the mean operative time for each screw insertion was 15.8 mins. No neurovascular complications, pelvic organ injury or perforation into hip joint was observed. CT scan after the operation showed satisfactory position of all screws in both groups without hip joint violation or iliac bone perforation. The entry site and screw tip position were checked against pre-operative screw planning. The mean deviation was 1.3mm for the entry site and 2.1mm for the screw tip.

Discussion and Conclusion: 3D computerized navigation was an effective and safe method for SAI screw insertion.