Thursday, 7 October 2021, 08:30–10:00

Cervical degenerative disease & New techniques

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IMMUNOMODULATORY EFFECT OF STEM CELL SECRETOME IN A LOADED ANNULUS FIBROSUS ORGAN CULTURE

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Introduction: Failure of the annulus fibrosus (AF) is often associated with disc herniation and activation of the immune system. Mesenchymal stem cell (MSC)-based therapies have been proposed for disc degeneration/herniation-associated back pain. But to overcome the limitations associated with cell transplantation, we investigated the impact of a cell-free therapeutic approach with MSC secretome on bovine AF organ cultures (AF-OCs) exposed to tensile stress and a proinflammatory environment.

Methods: AF rings were isolated from bovine tails (n=18) and stimulated with upper-physiologic cyclic tensile strain (CTS, 9%, 1 Hz, 3 h/day) and 10 ng/mL interleukin (IL)-1β (CTS+IL-1β) [1]. Sub-groups of stimulated AF-OCs were treated with either human MSC in coculture or secretome produced by preconditioned human MSC (n=3, preconditioning: 10 ng/mL IL-1β and 6 % O2 for 48 h). Unstimulated AF-OCs were kept as controls. AF cells gene expression for immune function regulators, catabolic enzymes and matrix components was investigated. Interleukin (IL)-6 and metalloproteinase (MMP)-3 production was confirmed at protein level. Glycosaminoglycan and collagen tissue content were also determined. AF adhesive strength was quantified in the tissue using a peel-force test. Statistics: one-way ANOVA or Kruskal-Wallis test.

Results: Four days of CTS+IL-1β stimulation upregulated the expression of bovine immune response mediators IL-6 and IL-8 ($p<0.05$), and of catabolic enzymes MMP-1 and MMP-3 ($p<0.01$). In contrast, treatment of the CTS+IL-1β-stimulated AF-OCs with the MSC secretome downregulated the expression of these markers ($p<0.05$). The changes in IL-6 (Figure 1A) and MMP-3 production were confirmed at protein level. In contrast, the MSC in coculture only downregulated IL-8 expression ($p<0.05$). Interestingly, both the MSC in coculture and the secretome contributed to a downregulation of collagen type I expression by AF cells ($p<0.001$), but only the secretome induced a significant decrease of total collagen content in the matrix ($p<0.05$, Figure 1B) and a decrease of the AF adhesive strength ($p<0.05$, Figure 1C) compared to the CTS+IL-1β stimulation alone. No differences were observed in glycosaminoglycan content.

Discussion: AF cells presented a proinflammatory/degenerative phenotype four days after CTS+IL-1β stimulation. The MSC secretome had a stronger impact than the MSC in coculture on decreasing the immune and catabolic response of AF cells activated by CTS+IL-1β conditions. However, the secretome also contributed to a further decrease of collagen at gene/protein level and of the AF mechanical strength observed in the CTS+IL-1β group. Using the MSC secretome as a therapeutic approach to modulate disc degeneration-associated inflammation is a promising tool, but requires long-term in vivo investigations to confirm the biomechanical alterations. References: 1. Saggese et al, Eur Spine J, 2019. Acknowledgements: Ulm University, German Spine Fdn., Humboldt Fdn.

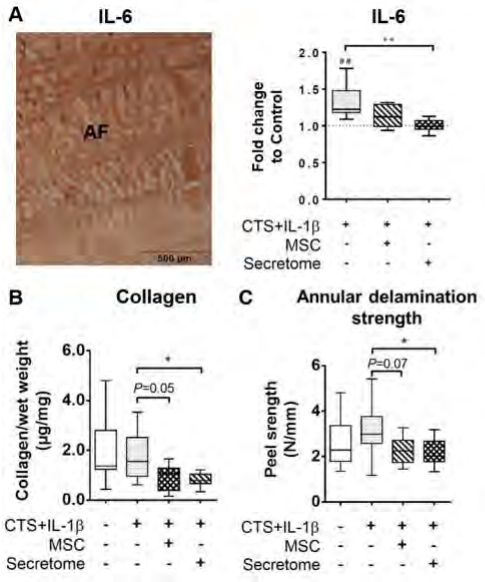

Figure 1. A) IL-6 immunostaining in AF-OCS and quantification of IL-6 staining intensity in the different stimulated groups normalized to to the unstimulated control sample for each experiment. **B)** Collagen content in AF tissues normalized to wet weight (µg/mg). **C)** AF peel strength as function of displacement rate (N/mm). n = 6-18, $^{*}p<0.05$, $^{**}p<0.01$ (* = significant effect between CTS+IL-1β stimulation and treatments); $^{\#\#}p<0.01$ (# = significant effect to control); one-way ANOVA.

Disclosures:
author 1: none; author 2: none; author 3: none; author 4: none; author 5: none; author 6: no indication; author 7: none

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PROSPECTIVE, RANDOMIZED, CONTROLLED, DOUBLE-BLINDED CLINICAL TRIAL COMPARING PEEK AND ALLOGRAFT SPACERS IN PATIENTS UNDERGOING TRANSFORAMINAL LUMBAR INTERBODY FUSION SURGERIES

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Introduction
Allograft and polyether-ether-ketone (PEEK) radiographic, biomechanical, histological properties have been extensively studied and both spacers have their advantages and shortcomings, but there are no comparative randomized controlled or double-blinded spinal fusion clinical trials reported to date. The primary objective of this study was to prospectively investigate clinical and radiological outcomes in patients undergoing lumbar interbody fusions and randomized to receive either PEEK or structural bone allografts.

Methods
A prospective, randomized, controlled, double-blinded clinical trial was initiated at a single center. All patients were followed for 2 years ± 2 months; radiographic and clinical outcomes were assessed at 3, 6, 12 and 24 months with an additional follow-up at 3 weeks for radiographic assessment.

Results
A total of 138 patients undergoing transforaminal lumbar interbody fusions (TLIF) were enrolled, randomized to receive either femoral cortical allograft or PEEK interbody lordotic spacers. (1:1) and 121 patients finished the study. Although no differences were detected between the allograft and PEEK patient groups at any of the follow-up time points, there was a highly significant ($p<0.0001$) improvement in all clinical outcome measures. Overall, evidence of radiographic fusion was achieved in 118 (97.5%) patients at the 24 months follow-up. Three patients, all in the allograft group had pseudoarthrosis and underwent revision surgeries. Postoperative improvement of sagittal alignment, anterior (ABH,) or posterior body height (PBH) was achieved initially, it was mainly lost or reduced at the final follow-up and there were no statistically significant differences between the groups.

Conclusion
Although allograft-assisted surgeries may have reduced fusion rates, the study findings demonstrated that TLIF surgery with two different types of cages had a similar effect on radiological or clinical outcomes and there was a highly statistically significant improvement in all clinical outcome measures at end of the study regardless of the randomization group.

Disclosures:
author 1: no indication; author 2: consultant=Medtronic; author 3: none; author 4: consultant=Functional Neuromodulation; author 5: none

MYELOPATHY DISABILITY INDEX: ESTABLISHING CRITERIA FOR MILD, MODERATE AND SEVERE IMPAIRMENT IN PATIENTS WITH DEGENERATIVE CERVICAL MYELOPATHY

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Introduction

Although Degenerative Cervical Myelopathy (DCM) is at present the main cause of spinal cord dysfunction in adults worldwide, existing systems for measuring the severity of the disease remain subjective and biased. The MDI score has demonstrated the greatest sensitivity to change and internal consistency compared to other scales.

The objective of this study is to establish cut-off values for mild, moderate and severe DCM according to the MDI score by using mJOA as an anchor.

Methods

All patients with DCM included from march 2018 to march 2021 in our prospective data base were enrolled in the study. Patients underwent a physical examination preoperatively and postoperatively at 6 and 12 months, in which diagnostic, neurological and functional variables were assessed. Functional scales (MDI, mJOA and Nurick) and quality of life questionnaires (SF-12 and EQ-5D) were administered. Surgical and radiological data were also collected. Receiver Operating Curve (ROC) analysis were plotted to establish the thresholds of severity in the MDI score, in which mJOA was used as an anchor.

Results

56 patients [62.5 % males; mean (SD) age 62.7 (12) y] were included in the analysis. Based on the mJOA score, 25 (44,6%) had mild DCM, 28 (50%) had moderate and only 3 (5,4%) had severe DCM. 43 (76.8%) were operated, 26 (46.6 %) were examined at 6 months and 23 (41.1%) at 12 months after surgery. The optimal cut-off value between mild and moderate was between 4 and 5, showing an AUC = 0.82 in the initial explorations, AUC = 0.79 in the 6-month and AUC = 0.85 in the 12-month explorations. The cut off value from moderate to severe was found to be between 7 and 8 with an AUC = 0.85 in the initial explorations, an AUC = 0.92 in the 6-month and AUC = 0.9 in the 12-month explorations (table).

Conclusion

According to the threshold values obtained and using mJOA as an anchor, the degree of severity established for the MDI score is mild between 0 and 4, moderate between 5 and 7 and severe from 8 onwards. Moreover, these thresholds are maintained at 6 and 12 months after surgery.

		Mild-Moderate	Moderate-Severe
Initial exploration (N = 56)	Cut-off value	4-5	7-8
	AUC	0.82 (0.75,0.93)	0.85 (0.69,1)
	Sensitivity	90.3%	85.7 %
	Specificity	60%	63.3%
6-month exploration (N = 24)	Cut-off value	4-5	7-8
	AUC	0.79 (0.61,0.97)	0.92 (0.77,1)
	Sensitivity	81.8%	80%
	Specificity	76.9%	84.2%
12-month exploration (N = 23)	Cut-off value	4-5	7-8
	AUC	0.85 (0.68,1)	0.9 (0.72,1)
	Sensitivity	88.9%	100%
	Specificity	57.1%	70%

Disclosures:
author 1: none; author 2: consultant=Vall d' Hebron; author 3: none; author 4: none; author 5: grants/research support=DePuySpine Synthes / Medtronic; author 6: grants/research support=MBA, consultant=MBA

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IMPACT OF CERVICAL KYPHOSIS ON INSTANTANEOUS CENTER OF ROTATION: A PROPENSITY-MATCHED COHORT ANALYSIS

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BACKGROUND: Cervical kyphosis could often be observed in patients with cervical degenerative disorders. The impact of cervical kyphosis on kinematics is still unknown.

PURSPOSE: The aim of this study was to assess the impact of cervical kyphosis on locations of ICR of each level of cervical spine.

METHODS: Data of all patients, who were surgically treated for cervical myelopathy, radiculopathy or deformity at a single institution from July 2012 to July 2018, were analyzed from the local database. Patients were divided into cervical kyphosis (S-type and more than 4° kyphosis) and cervical lordosis (less than 0° lordosis and without focal kyphosis) cohorts. Propensity matching was performed on the basis of age, sex, degree of each cervical disc degeneration from C3-C4 to C6-C7, distribution of the levels treated, number of segments fused and type of instrument applied. Segmental ICRs from C3-C4 to C6-C7 before surgery and adjacent segment ICRs at one year visit after surgery were measured.

RESULTS: From 46 patients with S-type cervical kyphosis and 408 patients with cervical lordosis, we assembled 39 matched pairs before and after surgery. A total of 383 locations of ICR were measured. Focal alignment in the cervical kyphosis group was 10.7° (5.5° to 15.4°), which decreased to −1.7° (−4.2° to 6.1°) following ACDF at one year visit. Postoperative kyphosis was identified in 6 patients. The ICRs of C3-C4 and C4-C5 were located farther forward in the cervical kyphosis group than in the control group before surgery ($p = 0.005$; $p < 0.001$). The ICRs of C3-4, C4-C5, C5-C6 and C6-C7 were located farther upward in the cervical kyphosis group than in the control group before surgery ($p = 0.03$; $p < 0.001$; $p = 0.001$; $p < 0.001$). At one year visit after ACDF, the locations of adjacent ICR showed no significant differences between the cervical postoperative lordosis group and control groups.

CONCLUSION: Cervical kyphosis could impact the locations of ICR. This impact could be eliminated by kyphosis correction. The knowledge of impact of cervical kyphosis on ICR could expend our understanding of kinematic mechanisms of how the cervical kyphosis aggravates myelopathy and cervical disc degeneration.

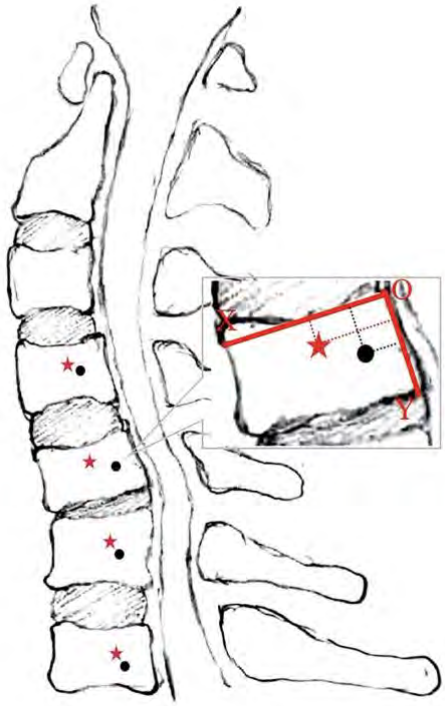

Fig. 1 Locations of instantaneous center of rotation of cervical kyphosis (red stars) and control/lordosis group (dark dots).

Disclosures:
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IS SUBSIDENCE AFTER STAND-ALONE ANTERIOR CERVICAL DISCECTOMY AND FUSION WITHOUT PLATE FIXATION HARMFUL TO PATIENTS WITH DEGENERATIVE CERVICAL DISEASE? A LONG-TERM FOLLOW-UP STUDY

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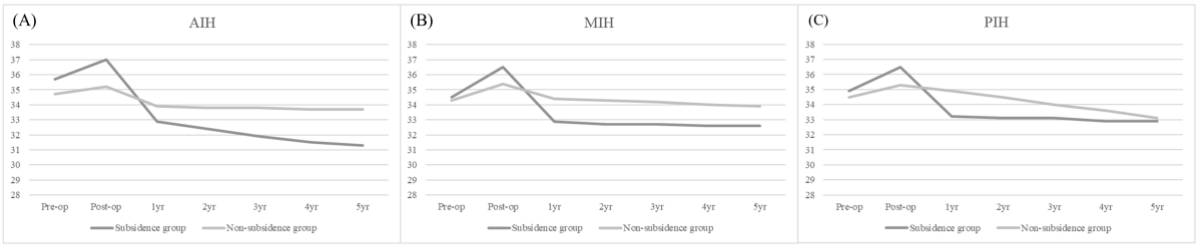
Objective: We aimed to examine the long-term radiological and clinical outcomes after stand-alone anterior cervical discectomy and fusion (ACDF).

Materials and Methods: In total, we enrolled 53 patients and 79 segments with degenerative cervical disease treated with stand-alone ACDF with ≥60 months of follow-up. The segmental angle (SA), cervical sagittal alignment (CSA), subsidence, and fusion were evaluated. The visual analogue scale (VAS) scores and Neck Disability Index (NDI) were also recorded.

Results: Subsidence occurred in 24 (45.2%) patients and 38 segments (48.1%) at the last follow-up. The mean VAS and NDI scores had improved in both groups with and without subsidence. The mean SA at the last follow-up had increased to 1.3° ± 8.5° in the subsidence group and to 1.5° ± 5.2° in the non-subsidence group compared to the post-operative SA ($p < 0.001$). The overall mean CSA at the last follow-up increased over time in both groups compared to the post-operative CSA ($p = 0.003$). The fusion rate at 1 year after surgery was 86.8% in the subsidence group and 82.9% in the non-subsidence group. However, the differences in the SA, CSA, and fusion rates between the two groups were not statistically significant ($p = 0.119$, 0.98, and 0.682, respectively).

Conclusion: After stand-alone ACDF, subsidence occurs to some extent, but it does not appear to have a significant impact on radiologic and clinical outcomes, if foramen decompression is adequately and sufficiently performed during surgery. It seems to have a positive influence on the fusion rate.



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ANTERIOR-ONLY VERSUS COMBINED ANTERIOR-POSTERIOR FUSION WITH ALLOGRAFT FOR MULTILEVEL CERVICAL SPINE FUSIONS: ARE THE FUSION RATES DIFFERENT?

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Background: Multilevel cervical spine decompression and fusion is the treatment of choice for patients with advanced degenerative cervical spine pathologies resulting in myelopathy or radiculopathy. Two surgical techniques include a stand-alone anterior cervical discectomy and fusion (ACDF) and a combined ACDF with posterior spine instrumented fusion (PSIF). The anterior-only approach is often preferred due to its tolerability; however, rates of pseudarthrosis are high using this approach for three or more levels of interbody fusion.
Purpose: This study examines the radiographic fusion rate in patients undergoing an anterior-only versus combined anteroposterior approach for three or more levels of interbody fusion.
Study Design/Setting: Retrospective cohort study
Patient Sample: We included all patients over the age of 18 years who underwent three or more levels of cervical interbody fusion between 2006 and 2016. Inclusion criteria included the diagnosis of myelopathy or radiculopathy secondary to degenerative cervical spine disease and at least one year of follow-up with imaging.
Outcome Measures: Three Orthopaedic surgeons independently reviewed flexion-extension plain radiographs or computed tomography (CT) to determine the levels of interbody fusion or pseudarthrosis for each patient.
Methods: Demographical, preoperative, and postoperative variables were collected retrospectively.
Results: Sixty-two patients were included in the study, of which 24 patients underwent an anterior-only approach while 38 patients underwent a combined anteroposterior approach. Of the patients undergoing the anterior-only approach, 46% (n=11) had at least one level of pseudarthrosis with 17% (n=4) requiring revision surgery. This is in contrast to the 5% (n=2) of patients in the anteroposterior approach with 2% (n=1) requiring revision surgery ($p<0.001$). The rate of pseudarthrosis was 20% (n=15/74 levels) with the anterior-only approach and 2% (n=2/119 levels) with the anteroposterior approach ($p<0.001$). Although not statistically significant, 11% (n=4) of patients in the anteroposterior approach required reoperation for wound complications compared to none in the anterior-only approach (p=0.1).
Conclusion: About 46% of patients undergoing the anterior-only approach to interbody fusion of three or more levels developed pseudarthrosis, with 17% requiring revision surgery. Alternatively, the combined anteroposterior approach resulted in a higher fusion rate of 98% compared to 80% in the anterior-only approach. However, this higher interbody fusion rate must be weighed against the increased risk of wound complications

Table 1. Procedure characteristics and complications comparing patients undergoing an anterior-only approach and those undergoing an anteroposterior approach. Values are presented as frequencies (percentages) and means.

	All	**Anterior-only Approach** *N (%) or Mean*	**Anteroposterior Approach** *N (%) or Mean*	**p-value**
Number of Interbody Levels				
Average	3.11 ± 0.32	3.08 ± 0.28	3.13 ± 0.34	0.549
Total	193	74	119	-
Average Length of Imaging Follow-Up				
Dynamic Radiographs (years)				

Computed Tomography (years)	3.17 ± 1.90 3.15 ± 2.11	3.56 ± 2.06 3.15 ± 2.17	2.92 ± 1.77 3.15 ± 2.13	0.217 0.999
Rate of Pseudarthrosis				
# of *Patients with ≥1 Levels*	13 (21%)	11 (46%)	2 (5%)	**<0.001**
# of Interbody Levels	17 (9%)	15 (20%)	2 (2%)	**<0.001**
Site of Nonunion				0.301
Cephalad end	5 (29%)	5 (33%)	0 (0%)	
Middle	2 (12%)	1 (7%)	1 (50%)	
Caudal end	10 (59%)	9 (60%)	1 (50%)	
Reoperation for Pseudarthrosis	5 (8%)	4 (17%)	1 (3%)	**0.048**
Reoperation for Wound Dehiscence	4 (6%)	0 (0%)	4 (11%)	0.100

p-value: two-sample t-test for parametric continuous variables, Mann-Whitney U test for nonparametric continuous variables, and Chi-squared for categorical variables.

Disclosures:
author 1: other financial report=Globus; author 2: none; author 3: none; author 4: none; author 5: none

LOW DOSE SPINAL ANAESTHESIA REDUCES PERI-OPERATIVE OPIOID CONSUMPTION IN POSTERIOR CERVICAL NECK SURGERY

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BACKGROUND

Posterior cervical spine surgery is painful, often requiring multimodal analgesia including local infiltration and intravenous morphine. Systemic morphine results in side effects such as sedation, nausea and constipation; often resulting in delayed discharge. The use of intrathecal morphine has been shown to provide good levels of analgesia following surgery for scoliosis, thoracic and lower limb surgery.

PURPOSE OF THE STUDY

We hypothesised that a novel technique of lumbar intrathecal morphine injection may enhance analgesia for patients undergoing posterior cervical neck surgery and reduce post-operative morphine requirements and length of stay.

MATERIAL AND METHODS

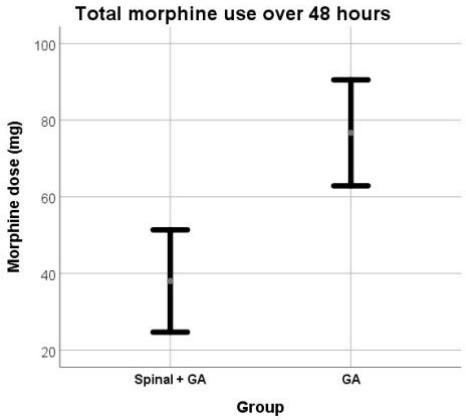
Prospective data were collected on 32 consecutive patients undergoing posterior cervical surgery who received intrathecal morphine. Outcomes were compared to a 1:1 matched cohort of patients undergoing similar surgery based on: age, type of surgery, spinal level and gender. The spinal group received lumbar intrathecal injection of 0.2mg morphine with 5ml saline prior to induction. They received no further long-acting opioids in theatre. The standard treatment group received an opioid-based general anaesthetic. Both groups received additional multimodal analgesia, including surgical local infiltration. Data were analysed using SPSS v.25. Paired sample T-tests were used to determine significant differences in pain scores, opioid use and length of stay for patients. Statistical significance was set at $p<0.05$.

RESULTS

In the spinal group, 26 patients (81%) were completely opioid-free intraoperatively and in recovery. No patients in the matched control group were opioid-free. Average perioperative morphine in the spinal group was markedly reduced 1.11mg vs 10.52mg ($p<0.01$). Time in recovery reduced to 59.4min vs 84.5mins ($p<0.01$). Mean VAS scores over 48 hours reduced to 4.6 vs 6.3 ($p=0.01$) with opioid consumption in the first 48 hours reduced to 33mg vs 81mg ($p<0.01$). Mean reduction in LOS was 2 days (2.06), however, did not reach statistical significance.

CONCLUSION

Addition of a lumbar intrathecal injection of low-dose morphine provides a significant opioid-sparing effect in posterior cervical surgery. This results in significant improvement in pain scores, faster discharge from recovery and appears to result in reduction in LOS for patients. Additional work is required to further elucidate the benefits of this technique and potential cost-saving advantage.



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TRANSFORAMINAL THORACIC INTERBODY FUSION: PATIENT-REPORTED OUTCOME AT 12 MONTHS

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Introduction
Transforaminal interbody fusion was initially popularized by Harms & Jeszenszky for the lumbar spine (TLIF). The same approach was later introduced for the thoracic spine (TTIF) in close proximity to the spinal cord. Mainly case reports or small series have reported the clinical results of TTIF, but these rarely included patient-reported outcomes (PROM). Here we report the PROM and the sagittal radiographic correction of TTIF achieved at one-year follow-up (FU).

Methods
A search was performed in our institutional spine register, which is based on the Spine Tango registry framework. Included were all TTIF procedures performed at least one year prior to data extraction, from 2012 to 2020. Patients had been asked to complete the Core Outcome Measures Index (COMI) before surgery and one year later. Preoperative and one-year postoperative standing lateral radiographs were reviewed, and the sagittal angle between the upper and lower endplates at the segments where TTIF was performed was measured.

Results
In total, 62 patients had undergone TTIF within the study's time-frame (21 males, 41 females; mean age 64.8 (SD 18.7) years). Altogether, TTIF was performed on 70 levels by four different surgeons. The primary diagnosis was degenerative spine disease in 39 (63%) cases, fracture-related spine disease in 18 (29%) cases, and non-degenerative deformity in 5 (8%) cases. The majority of the TTIF procedures were performed on the lower thoracic spine, with the level of procedure being T2/3 in 1, T3/4 in 1, T6/7 in 1, T7/8 in 1, T8/9 in 4, T9/10 in 4, T10/11 in 3, T11/12 in 25, and T12/L1 in 30 cases. An intervertebral lordotic cage was used in 49 (70%), titanium-mesh cage in 14 (20%), autograft in 6 (9%), and allograft in 1 (1%) of the TTIFs. Overall, 50/62 (81%) patients completed a preoperative COMI and 52/62 (84%) a one-year COMI. A total of 42 (68%) patients completed both a preoperative and a one-year FU COMI. Their COMI score reduced from a mean (SD) value of 8.0 (SD 1.9) preoperatively to 5.0 (SD 2.4) at 12 months' follow-up. 63.5% of patients reported that the operation helped/helped a lot, and 71.2% were satisfied/very satisfied with their care.
At one-year FU, a mean segmental kyphosis correction of 10.0 (SD 7.9, range from -6 to 27.7, $p<0.0001$) degrees was achieved.
There were two intra-operative dural lesions, two wound infections, and one case of permanent postoperative sensory dysfunction. There was no intraoperative spinal cord injury.

Conclusions
Transforaminal Interbody Fusion is a feasible approach to be used in the thoracic spine where interbody support and/or correction of a deformity is needed. Kyphosis correction of 10 degrees was maintained at one-year FU. There were no iatrogenic spinal cord lesions reported nor any other major surgical complications. PROM showed that there was clinically significant improvement at 12 months' follow-up, with a majority of the patients being satisfied with their care.

Disclosures:
author 1: no indication; author 2: none; author 3: stock/shareholder=Inno4Spine; author 4: consultant=DePuySynthes,,stock/shareholder=Inno4Spine; author 5: none; author 6: consultant=DePuy Synthes Spine, Medacta Spine,stock/shareholder=Inno4Spine, royalties=DePuy Synthes Spine, Medacta Spine

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A PROSPECTIVE CLINICAL TRIAL OF A MODIFICATION TO A STANDARD SURGICAL TECHNIQUE IN LUMBAR FUSION, SHOWS IMPROVED LORDOTIC CORRECTION

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Introduction

Restoring the correct amount of lordosis in a lumbar fusion is one measure of how good the fusion is, yet short fusions often under correct. We set out to investigate how to gain more lordosis easily. In a biomechanical model and with cadavers, using standard polyaxial pedicle screws, we compared the commonly used technique of compression, i.e. lock bottom screws and compress towards them 'lock bottom', with 'lock top' which reverses the direction of compression, by locking the most top screws and compressing in a cranial direction. These studies showed large differences in the amount of lordosis gained ($P < 0.001$). These results justified the clinical trial reported here.

Methods

With local ethics committee approval. Patients undergoing routine degenerative 1 or 2 level lumbar fusions underwent oblique insertion of interbody cages to all levels above L5, and anterior cage insertion to L5S1, followed by posterior exposure, screw insertion and decompression. With rods placed inside unlocked tulips, without the use of reduction instrumentation, an observer measured the amount of lordosis on fluoroscopy. The observer was blind to the operative technique and the images were all taken from a fixed position. After locking either superior or inferior screws, posterior compression was performed using standard compressors, towards the locked screws. Another image was taken and the amount of lordosis was measured using the same reference points. Then, screws were unlocked and the whole process repeated in the opposite direction for comparison. Thus, this was a cross over trial comparing the two techniques in the same patient, to control for variables. The starting direction was alternated randomly between patients and if tissue creep was observed (>1 between starting positions) a third compression was performed. The same 'white knuckle' amount of compression force was applied.

Results

There were 12 patients, 7 females and 5 males, average age 66, 7 patients underwent 1 level fusion and 5 underwent 2 level fusion. All patients underwent inferior facet or Ponte resections. Comparing conventional 'lock bottom' method (A) with 'lock top' method (B), The average lordotic improvement with compression after method A was 3.9 (range 1-7) compared with 6, (range 3 - 12) using method B.

In every cases method B was either same (n=2) or better (n=10), with an average of 2.1 more lordosis i.e. 54% more ($p< 0.015$).

Conclusions

The „lock top" technique was more effective at gaining lordosis in this type of lumbar spinal fusion, supporting our previous biomechanical studies. We will propose an explanation for these findings, that suggests new insights into motion segment behaviour during surgery, with implications for surgical technique and compressor design.

Disclosures:
author 1: none; author 2: none