

Hence, our study aims to compare the efficacy of high-dose and low-dose BMP on interbody fusion success and its potential side effects.

Materials and methods: We analysed a prospectively collected database involving patients who underwent minimally invasive transforaminal lumbar interbody fusion (MIS-TLIF) at a single institution from 2011 to 2018. These patients either received high-dose (4.2mg/level) or low-dose BMP (2.1mg/level) intra-operatively. Patients were matched based on age, gender, BMI, smoking status and level of surgery. Fusion status at 6 months, 12 months and 24 months following surgery was evaluated using the Bridwell interbody fusion grading system by a single evaluator. Secondary outcomes that were analysed include neurological status, visual analogue score (VAS) and Oswestry Disability Index (ODI). These outcomes were evaluated at 6 months, 12 months and 24 months following surgery.

Results: A total of 223 patients were analysed. 91.1% of the high-dose group and 97.8% of the low-dose group achieved fusion. Mean time to fusion was 7.2 months for the high-dose group and 10.1 months for the low-dose group. 95.4% of all patients achieved fusion within 1 year of surgery. With regards to neurological status, 45.3% of all patients showed improvement in the motor domain while 61.9% of all patients showed improvement in the sensory domain at the 2-year mark post-operatively. VAS back pain score improved from a mean of 6.3 at baseline to 0.8 at the 2-year mark post-operatively. VAS leg pain score improved from a mean of 6.1 at baseline to 0.7 at the 2-year mark post-operatively. ODI score improved from a mean of 48.1 at baseline to 11.8 at the 2-year mark post-operatively. With regards to side effects from the use of BMP, there were 3 cases of heterotopic ossification and 2 cases of radiculitis in the high-dose group while there was 1 case of radiculitis in the low-dose group.

Conclusion: Our study demonstrates that despite faster fusion rate, the dose of BMP used dose not impact the fusion success at 1 year. Similar improvements in neurological status, VAS and ODI scores were demonstrated in both groups. Usage of low-dose BMP also carries a lower risk of heterotopic ossification based on our study and lowered risk of radiculitis.

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000351

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Endplate degeneration and intervertebral vacuum phenomenon are positively correlated. A retrospective study in patients undergoing lumbar fusion surgery

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Introduction: Intervertebral vacuum phenomenon severity and the total endplate damage score are degenerative changes of the disc and endplate, respectively. We aimed to analyze the correlation between intervertebral vacuum phenomenon (IVP) severity and total endplate damage score (TEPS).

Materials and methods: We retrospectively analyzed a cohort of patients undergoing lumbar fusion surgery due to degenerative disease between 2013 – 2021. Computer tomography (CT) was used to classify the severity of the intervertebral vacuum phenomenon at each lumbar level and as a combined lumbar score (LVSS). Magnetic resonance imaging (MRI) was used to classify endplate degeneration by the total endplate damage score. The correlation between the combined lumbar IVP and TEPS was analyzed via a multivariable regression model.

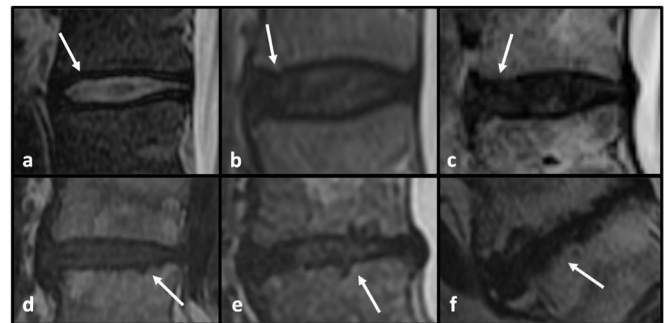
Results: 317 patients were analyzed with a median age of 63 years (IQR 55 – 71.2) and 48.9% (n = 155) were female. In all lumbar levels, the median TEPS was 4 (IQR 2 – 8). The severity of the TEPS was significantly associated with an increased odds ratio (OR) of having more severe IVP (OR: 1.78, 95% CI: 1.62 - 1.95, p < 0.001). After adjusting for multiple confounders, this relationship remained significant (OR: 1.32, 95% CI: 1.17 - 1.49, p < 0.001). Other independent significant influences were age (OR: 1.07, 95% CI: 1.04 - 1.10, p < 0.001) and the Pfirrmann grade (OR: 7.44, 95% CI: 4.40 - 12.58, p < 0.001). The analysis of the relationship between the combined lumbar vacuum score and lumbar endplate score was significant with a beta-coefficient (β) of 0.24 (95% CI:

0.20 - 0.28, p < 0.001).

Conclusion: We found a significant correlation between IVP and TEPS in patients undergoing spine fusion surgery. These results support the theory that endplate damage could play a role in the pathogenesis of IVP.



Example of IVP severity in three patients with a LVSS of 0 (a), 6 (b) and 15 (c).



Total endplate damage classification with increasing level of endplate damage (a-f)

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An international multicentric evaluation of septic patients with primary spondylodiscitis – The 2SICK study of the EANS spine section

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Introduction: The management of septic spondylodiscitis presents a clinical challenge, with debates surrounding the timing of surgical intervention. The 2SICK study addresses the gap in knowledge concerning the efficacy of early surgery versus conservative management in these critically ill patients.

Materials and methods: A multicentric, international retrospective cohort study encompassed cases from 2015-2022. Inclusion criteria were a CRP level >200 mg/l and a septic state upon admission. Patients were stratified by treatment modality (early surgery within 3 days of admission, delayed surgery after 3 or more days of non-surgical stabilisation, and conservative therapy). Chi-square tests, univariate analyses, stepwise and regularization-tuned multivariate regression analyses were used to examine outcome differences in mortality.

Results: A total of 189 patients, with a mean age of 69 years, were evaluated. Among these, 36 underwent conservative therapy, 79 underwent early surgery, and 74 received delayed surgery. The subgroup undergoing delayed surgery

exhibited the lowest mortality rates, with 4.1%. In comparison, the mortality rates for early surgery and conservative therapy were 28.2% and 27.8%, respectively. The ideal time frame for delayed surgery, in terms of mortality, was found to be between 10 and 14 days from admission. Accounting for confounders, delayed surgery was found to be significantly associated with decreased mortality ($p < 0.01$) compared to conservative therapy, and early surgery with increased mortality compared to conservative therapy ($p < 0.05$). Positive predictors of mortality were found to be age, reduced GFR, raised creatinine, multiple organ failure, cervical location of the infection, erosion of endplates, presence of psoas abscess and tachycardia at admission ($p < 0.05$). Negative predictors were days between admission and surgery and the presence of epidural abscess ($p < 0.05$).

Conclusion: Delayed surgery was found to be associated with significantly less mortality compared to early surgery and conservative therapy in patients with septic spondylodiscitis. The likely optimal window for surgery is 10 to 14 days from admission. The strongest predictors of death were early surgery within 3 days of admission, vertebral endplate erosion, and multiple organ failure.

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000409

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Lumbar lordosis curve and psoas major muscle angle in magnetic resonance imaging analysis

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Introduction: The current study aimed to identify the efficacy of injecting local anesthetic in the erector spinae muscle area immediately after decompression surgery based on postoperative pain control, functional outcome, and quality of life.

Materials and methods: This was a 3-month prospective, two-group, parallel, double-blind, randomized, controlled clinical trial conducted at a single medical center. In total, 40 patients ($n = 20$ in the study group and $n = 20$ in the control group) were enrolled in this research. The patients were divided into two groups using the permuted block randomization method preoperatively. In the study group, the injection cocktail comprising 20 mL of lidocaine, 20 mL of bupivacaine, and 20 mL of normal saline was administered to the exposed and retracted paraspinal muscles and surrounding soft tissues after decompression surgery. Meanwhile, 60 mL of normal saline was administered in the control group.

Results: Postoperative low back pain (LBP) was assessed using the visual analog scale (VAS) before and at 6 and 12 weeks after surgery. LBP was examined using the VAS every 8 h within the first 3 days after surgery. Functional outcomes were evaluated using the Oswestry Disability Index (ODI), Roland-Morris Disability Questionnaire (RMDQ), and 36-item Short Form (SF-36). The ODI and RMDQ were used for the assessment performed before and at 6 and 12 weeks after surgery. The SF-36 PCS and MCS domains were used in the examination conducted before and 12 weeks after surgery. Results showed no statistically significant difference in terms of VAS score improvement between the study and control groups at every interval (all $p > 0.05$). Further, the ODI, RMDQ, and SF-36 PCS and MCS domain scores at every interval did not significantly differ (all $p > 0.05$).

Conclusion: Local anesthetics with lidocaine and bupivacaine infiltration on the bilateral sides of the erector spinae muscle before surgical wound closure was not effective for postoperative LBP control. Nevertheless, this was a double-blind, randomized, controlled, prospective clinical pilot trial. Hence, further studies must be conducted to validate our results.

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Pain central sensitization in patients consulting for low back pain and foot pathology, are there differences?

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Introduction: Central sensitization of pain (CSP) is defined as increased sensitivity of nociceptive neurons in the central nervous system to normal or threshold

afferent stimuli. The presence of this phenomenon may modify treatment response in patients with low back pain. The aim of our study is to determine the prevalence of patients with CSP presenting for low back pain consultation and to assess if there are differences in prevalence compared to patients consulting for foot pathology.

Materials and methods: A retrospective prevalence study of central sensitization of pain comparing a cohort of patients attending initial consultation for low back pain and another cohort of patients consulting for foot/ankle pain was conducted. Demographic data, duration of symptoms, and questionnaire results including the Visual Analog Scale (VAS), functional questionnaires (Foot and Ankle Ability Measure (FAAM) for foot/ankle and Oswestry Disability Index (ODI) for low back pain), SF-12, and the Central Sensitization Inventory (CSI) were collected. Data analysis was performed using STATA

Results: A total of 195 patients with foot/ankle pathology and 252 patients with low back pain were included. 16.4% (95% CI, 10.92%-21.9%) of patients in the foot/ankle consultation presented CSP compared to 22.2% (95% CI, 16.85%-27.6%) in the low back pain consultation. The difference in CSP prevalence was not statistically significant (difference 5.79%, $\text{Chi-2} = 2.357$, $p = 0.125$) between the two groups; however, the difference in CSI questionnaire scores was significant (31.82 ± 13.88 and 25.20 ± 14.31 respectively, $z = 4.237$, $p = 0.000$). In both groups, more women presented with CSP. The most frequent diagnoses among those with CSP were spondyloarthritis, lumbar discopathy, or nonspecific low back pain.

Conclusion: Subjects consulting for low back pain associate higher CSI questionnaire scores and a higher prevalence of CSP compared to those consulting for foot and ankle pathology. Patients with central sensitization of pain experience more pain, poorer quality of life, and greater dysfunction than those who do not present it.

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000554

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Radiographic progression and spinal deformity in conservatively treated pyogenic spondylodiscitis: A monocentric, retrospective analysis of MRI data from 59 patients

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Introduction: The management of pyogenic spondylodiscitis (SD) often involves conservative treatment without surgical stabilization, yet the risk of developing spinal deformities during such management is not clearly predictable. This study explores the radiographic progression in SD under conservative care, focusing on patterns of spinal deformities and their association with initial clinical and radiological factors.

Materials and methods: A retrospective analysis of MRI data from 59 patients with conservatively treated SD was conducted. The progression of spinal deformities was categorized into four types based on distinct radiological features (Figure 1). Factors assessed included progressive deformity, translation, fractures, and fusion.

Results: The mean follow-up was 10.75 months. Progressive deformity was seen in 66% of patients. Segmental kyphosis of $>20^\circ$ increased from 12 cases upon admission to 23 at follow-up, representing a 92% increase. Segmental translation cases rose by 167%, from 3 to 8 cases. The distribution of progression types was as follows: No progression in 20 cases (34%), type1 in 2 cases (3%), type2 in 7 cases (12%), type3 in 13 cases (22%), and type4 in 17 cases (29%). Risk of segmental kyphosis $>20^\circ$ at follow-up was significantly increased by $>50\%$ involvement of the vertebral body at admission ($p = 0.0015$) and presence of an epidural abscess ($p = 0.03$). Positive predictors for progressive deformity of any kind were found to be $>50\%$ involvement of the vertebral body ($p = 0.03$) and vertebral body edema $>50\%$ ($p = 0.008$). Lumbar region involvement was significantly associated with reduced likelihood of spinal fusion at follow-up ($p = 0.01997$). The presence of a paravertebral abscess was significantly