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Failure Rates and Complications of Interspinous Process Decompression Devices: a European Multicenter Study

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INTRODUCTION: Spacers placed between the lumbar spinous processes represent a promising surgical treatment alternative for a variety of spinal pathologies. They provide an unloading distractive force to the stenotic motion segment, restoring foraminal height, and have the potential to relieve symptoms of degenerative disc disease. The authors performed a retrospective, multicenter nonrandomized study consisting of 1108 patients to evaluate implant survival and failure modes after the implantation of 8 different interspinous process devices (IPDs).

METHODS: The medical records of patients who had undergone placement of an IPD were retrospectively evaluated, and demographic information, diagnosis, and preoperative pain levels were recorded. Preoperative and postoperative clinical assessments in the patients were based on the visual analog scale. A minimum of 3 years after IPD placement, information on long-term outcomes was obtained from additional follow-up or from patient medical and radiological records.

RESULTS: One thousand one hundred eight patients affected by symptomatic 1- or 2-level segmental lumbar spine degenerative disease underwent placement of an IPD. The complication rate was 7.8%. There were 27 fractures of the spinous process and 23 dura mater tears with cerebrospinal fluid leakage. The ultimate failure rate requiring additional surgery was 9.6%. The reasons for revision, which always involved removal of the original implant, were acute worsening of low-back pain or lack of improvement (45 cases), recurrence of symptoms after an initial good outcome (42 cases), and implant dislocation (20 cases).

CONCLUSION: The IPD is not a substitute for a more invasive 3-column fusion procedure in cases of major instability and spondylolisthesis. Overdistraction, poor bone density, and poor patient selection may all be factors in the development of complications. Preoperatively, careful attention should be paid to bone density, appropriate implant size, and optimal patient selection.

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What Is the Effect of Open vs Percutaneous Screws on Complications Among Patients Undergoing Lateral Interbody Fusion for Adult Spinal Deformity?

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INTRODUCTION: This study aims to compare differences in incidence and type of complications (COMP) between circumferential minimally invasive surgery (cMIS), ie MIS transforaminal lumbar interbody fusion (TLIF) and/or lumbar lateral interbody fusion (LLIF) with MIS screws and hybrid approaches (HYB, ie MIS LLIF ± with open screws).

METHODS: A retrospective review of a multicenter MIS deformity database was performed. Inclusion criteria for this database: age >18 years, and at least one of the following: coronal Cobb angle (CCA) >20, SVA >5 cm, PI-LL >10, and PT >20. Only patients who underwent cMIS or HYB approaches were included for this study, and were propensity matched by levels instrumented.

RESULTS: Of 420 patients that met inclusion criteria, 165 had complete data. One hundred thirty-seven were available for analysis after excluding 3 column osteotomies and 76 remained after propensity matching (38 cMIS and 38 HYB). There were no differences in demographics, number of levels instrumented (6.8 HYB vs 6.1 cMIS; \( P = .622 \)), and pre- and postoperative radiographic results. HYB had significantly longer OR time (623 vs 490 minutes; \( P = .015 \)) and larger expected blood loss (1396 vs 637; \( P = .001 \)). 55.3% of HYB vs 44.7% cMIS patients experienced at least 1 COMP (\( P = .359 \)). cMIS patients had significantly fewer neurological (\( P = .044 \)), operative (\( P = .005 \)), and minor (\( P = .034 \)) COMPs. Reoperation was similar between groups (28.9% HYB, 26.3% cMIS). The most common COMP for cMIS was radiographic (\( n = 10; 6 \) with pseudoarthrosis) and neurological for HYB (\( n = 11; 8 \) with radiculopathy). Both groups saw improvement from pre- to postoperative Oswestry Disability Index, visual analog scale (VAS) back and leg (all \( P < .05 \)); however, cMIS had a greater reduction in VAS leg (\( P = .002 \)).

CONCLUSION: The overall COMP rate between cMIS and HYB is similar. cMIS surgery results in significantly fewer neurological, operative, and minor COMPs. Reoperation rates were similar, and, despite complications, patients saw significant improvement in pain and function.

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Predictive Modeling of Length of Hospital Stay Following Adult Spinal Deformity Correction: Analysis of 653 Patients With an Accuracy of 75% Within 2 Days

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INTRODUCTION: The length of stay (LOS) following adult spinal deformity (ASD) surgery is a critical time period allowing for recovery to levels safe enough to return home or to rehabilitation. Thus, the goal is to minimize it for conserving hospital resources and third-party payer pressure. Factors related to LOS have not been studied nor has a predictive model been created. The goal of this study was to construct a preadmission predictive model based on patients’ baseline variables and modifiable surgical parameters.

METHODS: Retrospective review of a multicenter, prospective ASD database. Inclusion criteria: operative patients, age >18 years, ASD. Patients with staged surgery at a separate hospitalization or LOS >30 days were excluded. Sixty-six variables were initially evaluated with 40 being used for model building following univariable predictor importance = 0.90, redundancy, and collinearity testing. Variables included: demographics, comorbidities, preoperative health-related quality of life, preoperative coronal and sagittal radiographic parameters, and modifiable surgical factors. A generalized linear model was constructed by using a training data set developed from a bootstrapped sample with replacement using a random number generator. Patients randomly omitted from the bootstrapped sample