

Clinical and Radiographic Parameters Associated with Best vs. Worst Clinical Outcomes in Minimally Invasive Deformity Surgery

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Introduction

MIS deformity techniques have limited ability to restore sagittal balance and match the PI-LL. However, MIS techniques are effective for decompression and limit tissue disruption. We sought to compare best vs. worst outcomes after MIS surgery to identify variables that predispose to postoperative success.

Methods

We did a retrospective review of circumferential MIS (cMIS) deformity surgery cases and compared parameters in the 20% of patients who had the greatest improvement in ODI vs. the 20% of patients who had the least improvement in ODI at two years follow up.

Results

104 patients underwent cMIS fusion surgery; the top 20% in terms of ODI improvement at 2 years (Best) were compared with the worst 20% (Worst). There was no statistically significant difference in age, BMI, pre- and postop Cobb angle, PT, PI, levels fused, O.R. time, and blood loss between the Best and Worst Groups. However, the preop ODI was significantly worse at baseline in the group that had the greatest change in ODI. There was no difference in preop PI-LL mismatch (12.8° Best vs. 19.5° Worst, $p=0.298$). Compared to patients who did poorly, patients who did well after MIS fusion had lower postop SVA (3.4 cm Best vs. 6.9 cm Worst, $p=0.043$) and had matched PI-LL (10° Best vs. 19° Worst, $p=0.027$). The Best Group also had better postop VAS back and leg pain scores ($p<0.05$).

Conclusions

MIS deformity surgeons should focus on correcting a patient's PI-LL mismatch to within 10° and restoring SVA < 5cm. Restoration of these parameters seems to impact which patients will achieve the greatest degree of improvement in ODI outcomes, while patients who do worst are not appropriately corrected (fused into a fixed deformity).

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of spinopelvic parameters in deformity surgery, 2) Discuss, in small groups, the factors important in patient outcomes after deformity surgery, and 3) Identify which patients are good candidates for MIS deformity surgery.