

Extension of previous fusions to the Sacro-Pelvis vs. Primary spino-pelvic fusions in the setting of adult deformity: A Comparison of health related quality of life measures and complications

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Summary: Clinical and radiographic evaluation of revision extension of previous long thoracolumbar fusion to the sacro-pelvis compared to primary lumbosacral fusion indicates that although the two patient populations are heterogeneous, clinical outcomes and complication rates of salvage procedures where a prior spinal fusion procedure is extended to the sacropelvis compare favorably to primary sacro-pelvic fusion for adult spinal deformity.

Introduction: Patients previously treated with thoracolumbar fusion for spinal deformity may develop degenerative changes below the fusion requiring revision fusion to the sacro-pelvis. Little data exists on the characteristics of patients treated with revision extension to sacro-pelvis compared to primary lumbosacral fusion. We evaluated the differences between patients undergoing revision extension of fusion vs. primary fusion to the sacro-pelvis, minimum 2-year follow-up.

Methods: The revision group (REVISION) included multicenter retrospective evaluation of 44 of 54 consecutive patients (1995-2006) that had a previous long fusion ending from L3-5, revised by extension fusion to the sacro-pelvis for symptomatic degeneration. The primary group (PRIMARY) included 20 of 20 consecutive patients prospectively enrolled (2000-2006) at a single center database that received primary long arthrodesis to the sacro-pelvis for adult deformity. Clinical and radiographic evaluation included demographics, coronal and sagittal measures, postoperative SRS-22 scores, and perioperative complications.

Results: Mean patient age was 52 years (range 21-81 years). Mean follow up was 43 months (range 23-135 months). PRIMARY had greater median age (59 vs. 49 years; $p<0.01$) and longer follow up (44 vs. 31 months, $p<0.05$) than REVISION. PRIMARY had larger preoperative thoracolumbar curve (median TL; 48° vs. 36°; $p<0.01$) and less sagittal imbalance (median SVA; 0.0 vs. 5.0 cm; $p<0.05$) than REVISION. Postoperative SVA was similar for PRIMARY and REVISION (median 0.9 vs. 2.6 cm, respectively; $p=0.25$). REVISION had better postoperative SRS-22 scores (median 3.80

vs. 3.12, $p < 0.01$) and fewer patients with minimum one complication [11 (25%) vs. 11 (55%), $p < 0.05$] than PRIMARY (Table 1)

Conclusion: Significant differences were demonstrated between patients undergoing primary vs. revision extension to the sacro-pelvis. PRIMARY were older, and had larger TL curves, whereas REVISION had greater sagittal imbalance. While PRIMARY had more complications, multiple factors could account for this other than surgery type, including differences in age or number of levels fused. The retrospective nature of the study may have also underrepresented minor complications. Although the groups were heterogeneous, radiographic, SRS-22 and complications analysis indicate clinical outcomes of salvage procedures where a prior spinal fusion procedure is extended to the sacropelvis compare favorably to primary sacro-pelvic fusion for adult spinal deformity.