Evaluation of the L5-S1 Interbody Space with Trans-sacral L5-S1 Fusion (AxiaLif)

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Introduction: Pre-sacral minimally invasive spinal (MIS) L5-S1 fusion continues to emerge as an important treatment for disease of the lumbosacral spine. Disk height (DH) loss and distraction are important radiographic outcomes, and the authors present initial radiographic findings and discuss their implications in 26 patients.

Methods: Between June 2005 and January 2009, 26 patients were treated with MIS L5-S1 pre-sacral interbody fusion. There were 12 females and 14 males, with an average age of 48.7 yrs. The authors considered these radiographic parameters: anterior and posterior disc height (ADH, PDH) relative to endplate (%), Farfan method, percentage increase or decrease of ADH or PDH following operation; DH relative to implant (%), modified Farfan) at follow-up. Predictors of DH loss are reported and analyzed.

Results: Using a fixed end-plate length (Farfan method), average ADH distraction was 46.7% (range 26.9-144.0) and PDH distraction 4.1% (-30.0-69.4) in eleven patients. The increase in ADH was significant (p = 0.05, student's t test). Inter-rater reliability was .95. DH loss of 15.9% (2.4-31.9) was observed in 22 patients at 7.44 months (range 2-11 months). In 16 patients with pedicle fixation, DH was 9.9% (range 2.6-17.9). In 8 with transfacet fixation, DH loss was 20.9% (12.6-31.9%), (p < 0.001). Smoking history, age, time, and degree of distraction did not predict disk height loss. Weight > 250 lbs was predictive with multiplicative analysis (p = 0.04). Inter-rater reliability was .87.

Conclusion: MIS pre-sacral fusion provides significant distraction of the anterior disk space. DH loss with time is similar to established approaches for interbody fusion. Preservation of post-operative DH may best preserved with pedicle screw fixation.