Paper #35: Pelvic Anchor Outcomes in Growing Rod Constructs: An Analysis of Patients with a Minimum of 4 Years of Post-Operative Follow-Up

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Introduction: The purpose of this study was to evaluate which distal anchors provide the best correction of pelvic obliquity, sagittal balance, thoracic kyphosis, and lumbar lordosis in patients with at least 4 years of post-operative follow-up. In addition long-term complications were evaluated based upon the type of distal pelvic fixation used.

Methods: Records and radiographs of 33 patients from a multicenter early onset scoliosis database with growing rods anchored to the pelvis were evaluated. 15 patients were male and 18 were female; underlying etiologies were 23 neuromuscular, 9 syndromic, and 1 congenital. Patients with < 4 years of post-operative follow-up were excluded. Pelvic obliquity was defined as the angle formed by a line traversing the midpoint of T1 to S1 and a line that is tangential to the iliac crests, subtracted from 90°. The analysis of variance was used to examine overall differences of radiographic parameters among the different pelvic constructs. Frequencies of various complications were compared using the χ2 test.

Results: Distal fixation constructs included 20 iliac screws, 8 iliac rods, and 5 sacral screws/rods (Fig. 1). At final follow-up 6 patients were converted from iliac rods to iliac screws, 1 had their iliac screws removed, and 1 was converted to a VEPTR construct. The mean improvement in pelvic obliquity, major Cobb angle, and sagittal balance at final follow-up was 74%, 45%, and 53% respectively. In comparison to distal constructs anchored to the sacrum only, constructs anchored to the ilium offered a greater correction in pelvic obliquity (p= 0.03). There was no statistically significant difference between any of the distal fixation constructs in regards to major Cobb angle, T1-S1 length, thoracic kyphosis, lumbar lordosis, or sagittal balance at final follow-up. Complications included 10 patients with post-operative infections, 3 with prominent pelvic hardware, and 7 with distal anchor pullout or failure. There was no statistically significant difference in presence or type of complications between all distal fixation constructs.

Conclusion: Growing rod constructs anchored distally to the ilium offer significantly greater improvement in pelvic obliquity on long-term follow-up as compared to growing rod constructs anchored to the sacrum only. In contrast to patients with 2 years of follow-up, at ≥ 4 years of follow-up
there is no significant difference in complications with regards to iliac screws, iliac rods, or sacral screws/rods in growing rod constructs.