Leave it Alone: The Natural History of Growth Friendly Graduates Without a Final Fusion

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Background

The natural history of growth friendly graduates treated with growing instrumentation, but no final fusion is unknown. Two small reports exist, but there is no comprehensive data set in the literature.

Methods

The Pediatric Spine Study Group database was queried for patients with TGR or VEPTR and at least two years follow up. Patients met inclusion criteria if they had not undergone a final fusion procedure but had completed planned interventions for EOS. Demographic data included age, gender, race, etiology, diagnosis, comorbidities, height, weight, ambulatory status, and prior treatment. Radiographic data included major/minor cobb angles and levels, spinal height, sagittal kyphosis, and proximal junctional degree.

Results

1215 patients underwent growth-friendly surgery TGR or VEPTR with no final fusion, and 234 of those had minimum 2 years follow up. Diagnoses were: 99 congenital, 71 neuromuscular, 43 syndromic, 20 idiopathic. Definitive treatment was implant maintenance in 204 (87%), removal in 30 (13%). Of those who did not keep implants, 18/30 (60%) had UPROR prior to implant removal. Of those who

retained implants, UPROR rate prior to definitive procedure was 30% (62/204). The proportion of patients who successfully avoided an UPROR after definitive procedure was similar between those who retained compared to removed implants (Figure 1). Implant removed group lost a mean 7 degrees of curvature compared to 3 degrees in implants retained group.

Conclusions

Growth friendly graduates who are observed but do not undergo a final fusion have a high UPROR rate overall, but only 4% after their definitive procedure. Curve magnitude was well maintained in this cohort whether implants were removed or kept.

Figure 1. Proportion of patients successfully avoiding an UPROR after definitive procedure in those who retained versus removed implants.