Paper #20: Diminished PFT's in Growing Rod Graduates despite Improved Thoracic Height and Curve Correction

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Introduction: Long term outcomes of growing rod instrumentation (GRI) are becoming more available as adolescents achieving sufficient spine length or requiring "final" fusion complete the lengthening segment of their treatment. We report xray and pulmonary outcomes in 6 patients from a single institution completing GRI treatment.

Methods: 6 patients with severe EOS (mean curve 98 deg) have completed surgical treatment as part of a treatment program spanning 10 yrs from initial presentation. Outcomes measured include xray parameters, PFT's and surgical data.

Results: Dx's included 2 IIS, 2 idiopathic-like, 1 congenital, 1 ambulatory N-M. Mean preop age was 74 mo (range 58-89), with preliminary non-operative treatment (halo-traction, cast/brace) delaying GRI 38 mo (range 21-56) in 4 cases. Most recent surgery at age 129 mo (121-157) included definitive fusion in 4 cases, with 1-2.4 yr f/u post fusion, and lengthening only in 2, with 3-4 yr further observation. Mean total procedures per patient were 8.3, including initial implantation, 1.2 unplanned revision/I&D, and 6.2 lengthenings (range 3-9). At last f/u mean age = 156 mo (133-180). T1-12 height increased from 13.9 cm (9.9-17.7) preop to 22.8 (18.6-29.5) at last surgery, to 23.9 (20.3-29.6) at last f/u. Curve magnitude decreased from 98 deg(75-123) to 48 deg at last surgery and to 42 deg(26-53) at last f/u. PFT's were first performed at mean 6+9 yr (4+10-8+7), and by last f/u, absolute FEV1 had doubled from .71 L (.48-1.2) to 1.45 L (.64-2.4), however % pred FEV1 decreased 61 -> 46.5%. Absolute FVC also increased .75 L (.48-1.2) to 1.73 L (1.1-3.0), but %pred FVC decreased 62 -> 49%. 7 rod/anchor complications in 4 patients were the only complications.

Conclusions: in spite of what appears to be satisfactory thoracic length gain and curve correction during 7 year of surgical management with acceptable complication rate, pulmonary outcomes are diminished by % pred outcomes criteria. The significance of this finding is uncertain without other corroborating data, but room for improved techniques clearly exists.