**Paper #42: Can a “No Final Fusion” Produce Equal Results to Final Fusion After Growing Rod Treatment?**

Amit Jain, MD; Paul D. Sponseller, MD, MBA; Urvij Modhia, MD; Suken A. Shah, MD; George H. Thompson, MD; Jeff B. Pawelek; Behrooz A. Akbarnia, MD; Growing Spine Study Group


**Introduction:** Definitive “final” fusion is the common endpoint to growing rod treatment (GR) for early onset scoliosis (EOS). However, final fusion may not be necessary for a subset of EOS patients who have reached skeletal maturity with good alignment, and these patients may end their GR treatment with no definitive fusion. The aim of our study was to characterize patients who completed GR treatment but received no final spinal fusion (NF, and compare them to those who underwent fusion.

**Methods:** A multicenter EOS database was queried to identify 160 patients who received GR treatment and reached skeletal maturity (Risser 3 or above). Radiographs and clinical records of these patients were reviewed. 19 patients were identified as having received GR surgery without a final fusion. Clinical and radiographic characteristics of NF patients were compared against those who did receive final fusion (FF) at skeletal maturity. All patients had a minimum of 2 year follow-up from final procedure.

**Results:** There was no significant difference in the NF and FF groups in: age at which growing rod treatment was initiated, in % female patients, or in the distribution of C-EOS patient diagnoses. There was no significant difference in the two groups in the mean lengthening procedures (NF group 6.4±3.5 procedures vs. FF group 5.6±3.9 procedures, P=0.36). All 19 patients in the NF group had their rods retained at final distraction, and there were no rod fractures at 2 year follow-up. The mean follow-up time in NF group after last distraction was 3.3±1.6 years. The mean age at last follow-up in the NF group was 14.5±3.1 years and in the FF group was 15.2±2.8 years.

In the NF group, at the end of treatment, the average primary curve correction was 46%, from 76±23° to 41±21°. In the FF group, the average primary curve correction was 37%, from 74±19° to 46±18°. The difference in the final curve magnitude between the two groups was not significant (P=0.23).

In the NF group, the average increase in trunk height (as defined by T1-S1 length) was 30%, from 270±54 mm to 385±30 mm. In the FF group, the average increase in T1-S1 trunk height was 25%, from 269±54 mm to 361±25 mm. The final trunk height in the NF group was significantly higher (P<0.01).

**Conclusions:** Patients who did not receive a final fusion had excellent final coronal correction and trunk height, and had no rod fractures. Due to progressive ankylosis, “No Final Fusion” at maturity is a viable
option for patients being treated with GR in all C-EOS diagnostic groups who have satisfactory final alignment. Final fusion may thus be needed only in patients having a residual problem at maturity.