Introduction: Guided segmental spinal instrumentation in early onset scoliosis (EOS) results in growth and correction of deformity. The purpose of this study is to report the long-term outcome of a series of patients with EOS and a subset with spinal muscular atrophy who were all treated surgically with posterior segmental spinal instrumentation without fusion.

Methods: This study is a retrospective chart and radiographic review of a single-center and single surgeon series of 20 consecutive EOS patients with documented progression of neuromuscular or syndromic scoliosis greater than 20 degrees. All patients received surgical treatment with growing segmental spinal instrumentation without fusion. All patients had pelvic fixation or pedicle screw fixation with sublamina Songer cables. Stainless steel rods extended beyond the sublamina fixation to allow for guided growth. This surgery is the definitive treatment for EOS without the need for additional or repetitive invasive procedures for lengthening or construct modification.

Results: The mean age at surgery for the SMA and non-SMA groups were 80.7 and 106.4 months respectively. On average 15 segments were instrumented. None of the patients went on to a spontaneous fusion and the average growth per year exceeded 1.3 cm. A total of three additional surgeries were needed in two patients to address complications. All of the patients are alive and currently doing well.

Conclusions: Guided growing segmental spinal instrumentation is a safe and effective treatment in EOS. All patients displayed growth post-operatively without the need for multiple distraction based surgeries. Guided growing segmental spinal instrumentation minimizes the risks associated with multiple surgical procedures.