Does the Type of Proximal Anchor Used During Distraction-Based Surgeries for Patients With Non-Idiopathic EOS Affect Spine Length?

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Background

Lengthening of Dual Growing Rods and the Law of Diminishing Returns

Wudbhav N. Sankar, MD, David L. Skaggs, MD, Muharrem Yazici, MD, Charles E. Johnston II, MD, Suken A. Shah, MD, Pooya Javidan, MD, Rishi V. Kadakia, BS, Thomas F. Day, MD, and Behrooz A. Akbarnia, MD

- Auto fusion?
- Supports delay tactic with casting
Sagittal Spine Length (SSL)

Spurway et al., Spine Deformity 2016
Introduction

- It has been shown that Spine length continued to increase during distraction phase of treatment for EOS.

- It is unclear whether the choice of proximal anchor affects the spine length achieved with distraction-based surgeries.
Purpose

› To determine if the choice of proximal anchor in distraction-based surgeries will affect final spine length in non-idiopathic EOS.

Hypothesis

› Distraction-based surgeries will increase spine length in patients with non-idiopathic EOS; however, there may be differences in the outcome based on the proximal anchor choice (Spine-based & Rib-based).
Design & Methods

- Retrospective, comparative multi-center, review of patients with non-idiopathic EOS treated with distraction-based systems

- Minimum 5 yr f/u and 5 lengthenings

- Primary outcome was T1–S1 SSL
  - Pre-op
  - Post-implant (L1)
Patients

- 126 patients

<table>
<thead>
<tr>
<th>Etiology/Anchor point</th>
<th>Rib based</th>
<th>Spine based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital</td>
<td>52</td>
<td>12</td>
</tr>
<tr>
<td>Syndromic</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Neuromuscular</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>57</strong></td>
</tr>
</tbody>
</table>

- Average pre-op age 4.6 yrs
- Average pre-op Scoliosis 75°
- Average pre-op Kyphosis 48°.
Results

After initial correction*, Scoliosis remained constant and Kyphosis increased over time*.

*\(p<0.05\)
Results

Spine length continued to increase during the distraction phase up to the 15th lengthening*. 

*\( p < 0.05 \)
Results

Pre–Op SSL was higher in SB group*, this difference was maintained throughout the distraction phase to the final lengthening *.
Results

SSL(Total) change as a percentage of pre-op height

At L11–15, RB group gained more height when normalized to pre-op height*.

*p<0.05
Distraction-based surgeries increased spine length for patients with non-idiopathic EOS; regardless of proximal anchor choice.

SSL was greater for SB implants pre-op and this difference was maintained to the 15th lengthening.

RB implants achieved more relative growth with time.

Conclusion
References


Thank You