Distraction-Based Surgeries Increase Spine Length for Patients with Non-Idiopathic EOS – 5 Year Follow up

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Growing Spine Foundation

CHILDREN'S SPINE FOUNDATION®

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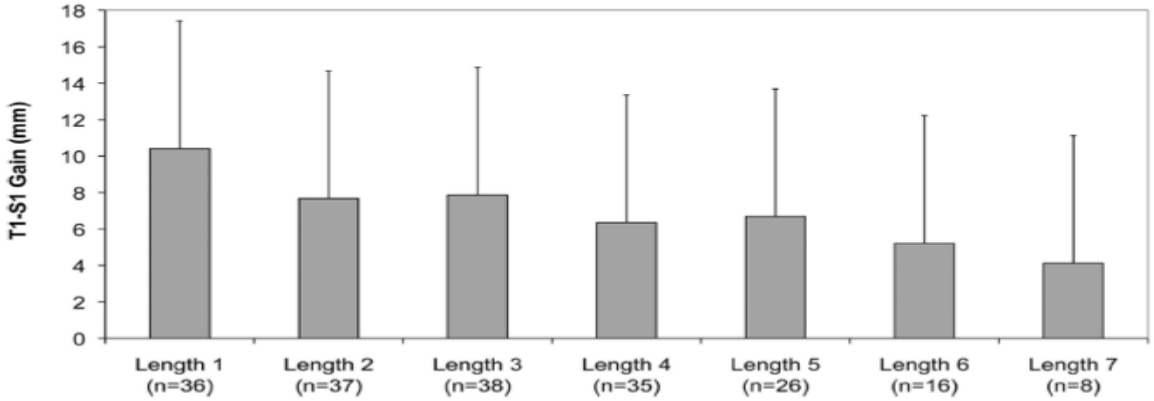
Background

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



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- Auto fusion?
- Supports delay tactic with casting

Introduction

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

- As EOS has many etiologies, it is unclear whether underlying etiology affects the spine length achieved with distraction-based surgeries.

Purpose

- To determine if distraction-based surgeries will increase spine length in patients with **non-idiopathic** EOS and whether etiology affects final spine length.

Hypothesis

- Distraction-based surgeries will increase spine length in patients with non-idiopathic EOS; although there may be differences between etiologies

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)
  - Lengthening Intervals (L2-5, L6-10, L11-15).

Patients

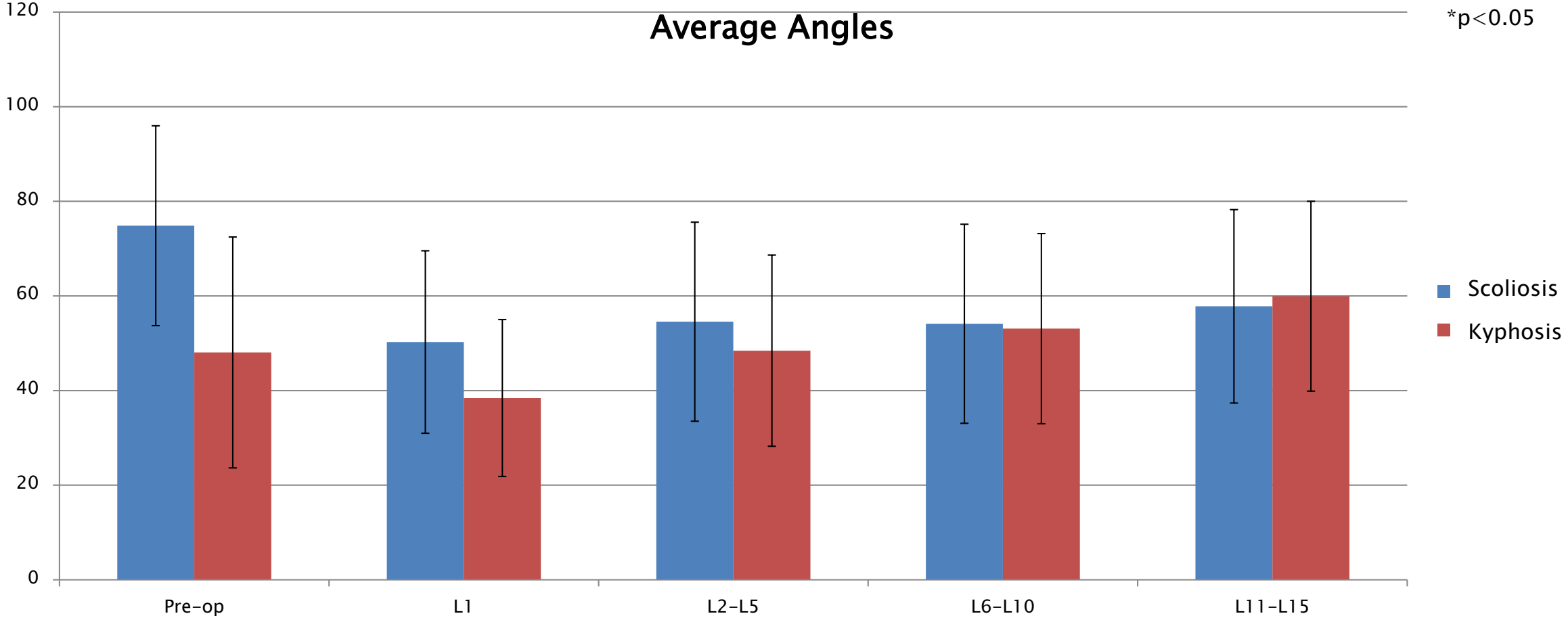
- 126 patients
  - 67 congenital
  - 38 syndromic
  - 21 neuromuscular

- Average pre-op age 4.6 yrs

- Average pre-op Scoliosis 75°

- Average pre-op Kyphosis 48°.

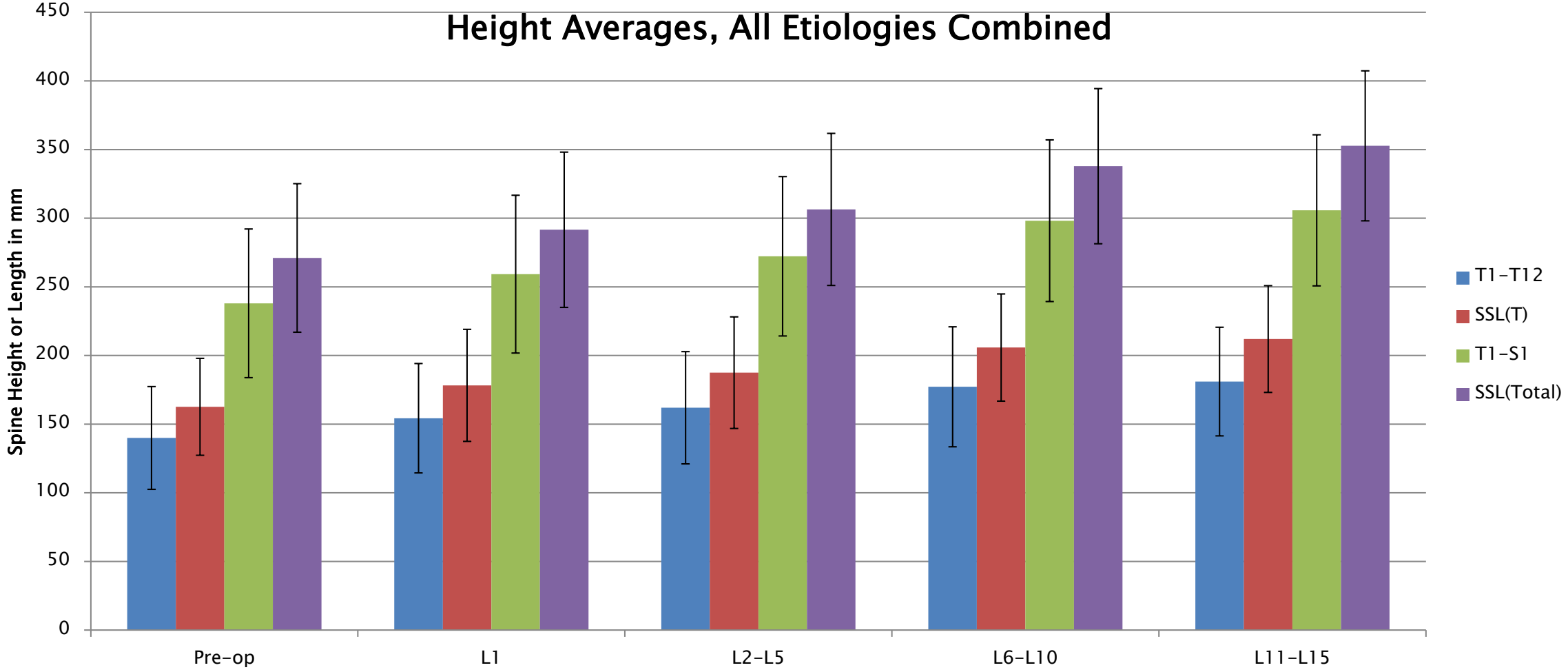
Results



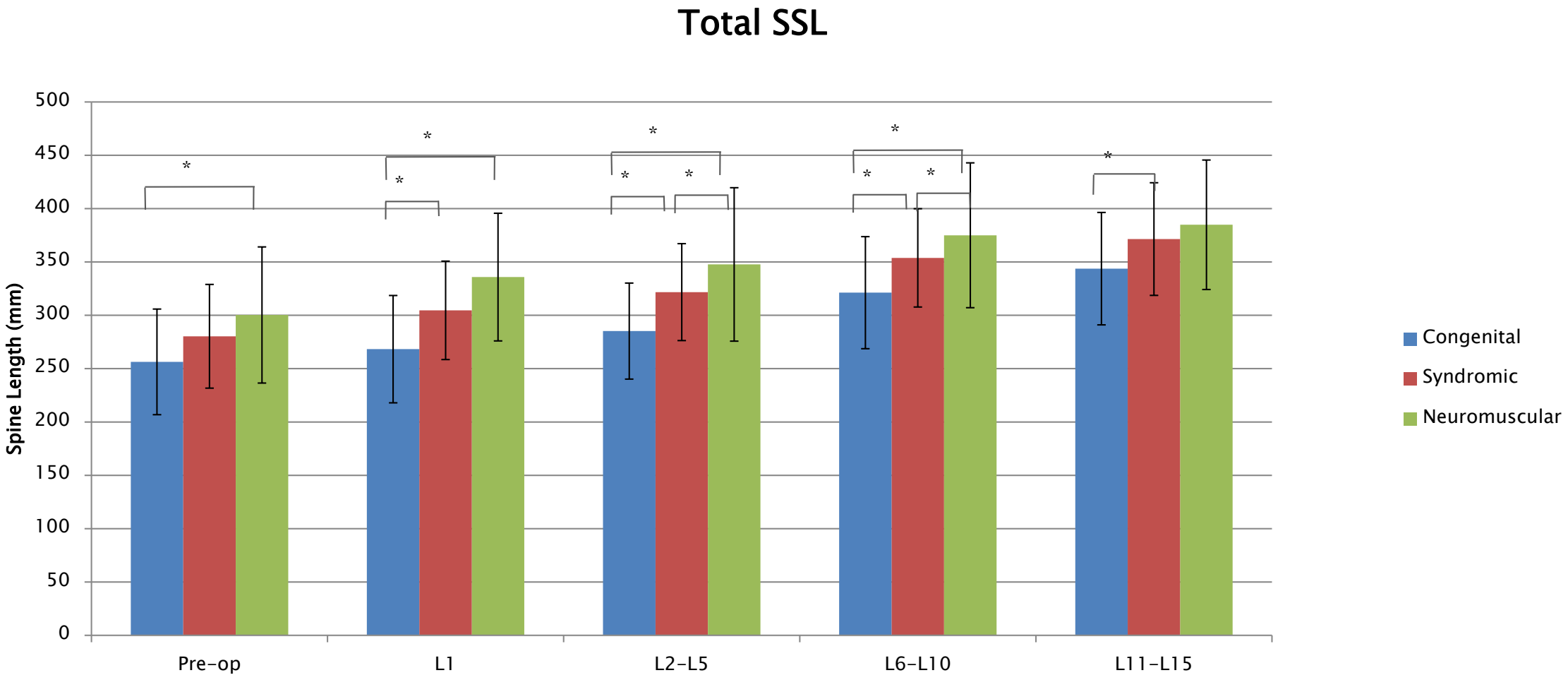
*p<0.05

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

Results


Height Averages, All Etiologies Combined
Spine Height or Length in mm
450
400
350
300
250
200
150
100
50
0
Pre-op
L1
L2-L5
L6-L10
L11-L15
T1-T12
SSL(T)
T1-S1
SSL(Total)

Results


Total SSL
Spine Length (mm)
500
450
400
350
300
250
200
150
100
50
0
Pre-op
L1
L2-L5
L6-L10
L11-L15
Congenital
Syndromic
Neuromuscular

Conclusion

- At minimum 5 year follow up, distraction-based surgeries increased spine length for patients with non-idiopathic EOS.

- The etiology of non-idiopathic scoliosis affects final spine length achieved during distraction-based surgeries:
  - Pre-op SSL was higher in neuromuscular patients compared to congenital patients and maintained that difference until the 10th lengthening*
  - Congenital & syndromic patients had similar pre-op spine length, however; syndromic patients achieved higher final spine length*

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