

Does the “Law of Diminishing Returns” apply to guided growth Shilla constructs?

LINDSAY M. ANDRAS MD
HALEH BADKOOBEHI MD
ALEXANDER BROOM BA
LYNN MCCULLOUGH RNP
RICHARD MCCARTHY MD
DAVID L. SKAGGS MD
GROWING SPINE STUDY GROUP



Disclosures

Lindsay Andras, MD-None

Haleh Badkoobehi, MD-None

Alexander Broom, BA-None

Lynn McCullough, RNP-None

Richard McCarthy, MD

Medtronic (b,d,e)

David L. Skaggs, MD

POSNA (a); SRS (a); Biomet (b, d); Medtronic (b, d, e, patent holder); Stryker (d); Wolters Kluwer Health - Lippincott Williams & Wilkins (e)

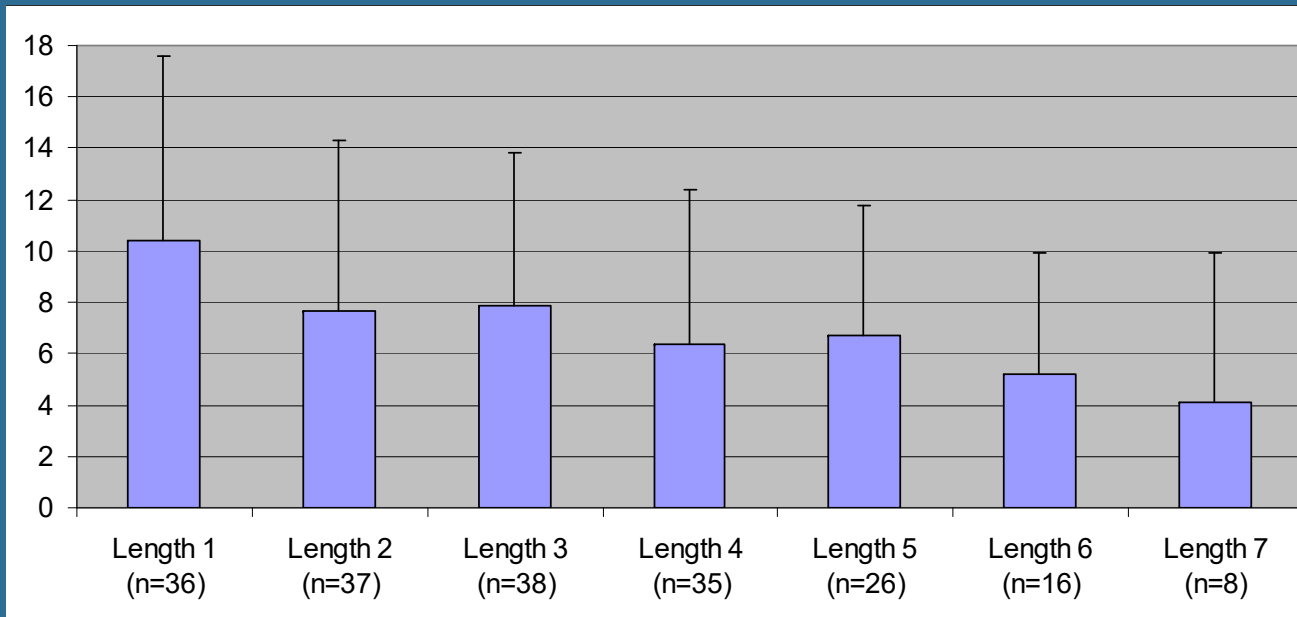
- a. Grants/Research Support
- b. Consultant
- c. Stock/Shareholder
- d. Speakers' Bureau
- e. Other Financial Support



Background

Distraction Based Growing Rods: Law of Diminishing Returns

T1-S1
Gain
(mm)

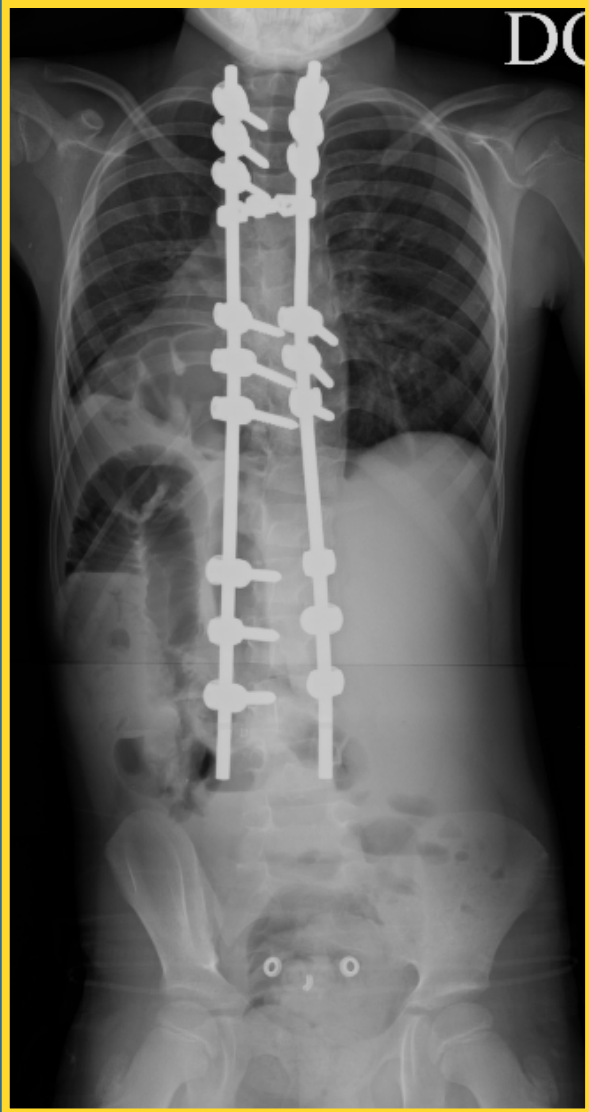


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Background

- Prior comparison of Shilla to Growing Rods showed greater increase in T1-S1 length in Growing Rod patients
- No study has examined whether the “law of diminishing returns” occurs in Shilla patients





Study purpose

To determine if the
“law of diminishing returns”
also occurs in guided
growth Shilla constructs

Materials and Methods

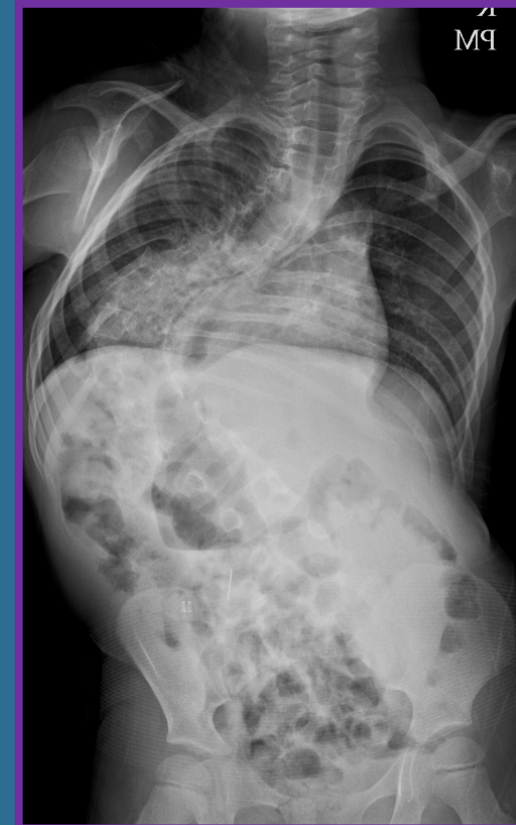
Multicenter retrospective review

Inclusion criteria:

- Diagnosis of early onset scoliosis
- Guided growth Shilla construct
- Minimum two year follow up

Exclusion criteria:

- Prior instrumentation
- Index procedure ≥ 10 yo



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Southern California

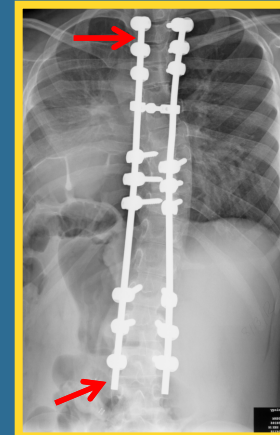
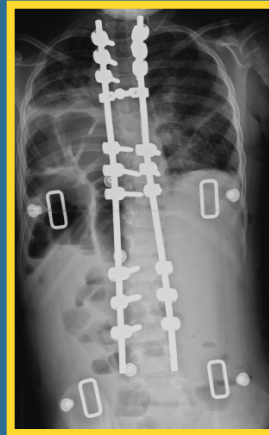
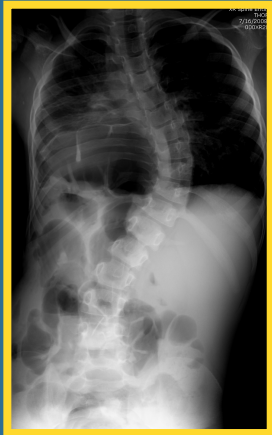
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Materials and Methods

- T1-S1 length was measured on upright radiographs preoperatively, postoperatively and at annual intervals
- Nonparametric analysis of variance and linear regression performed



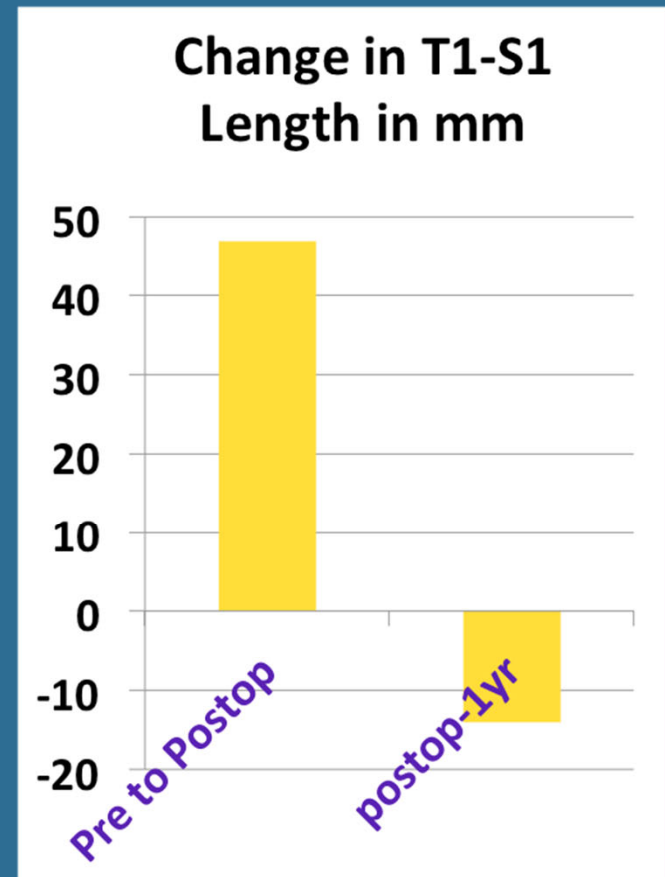
Results



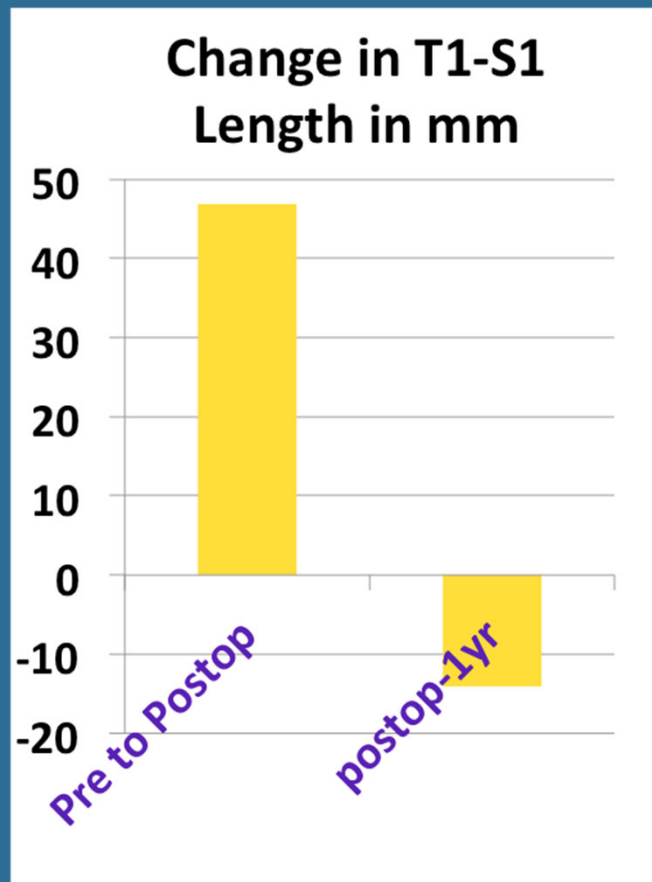
- 33 patients met inclusion criteria
- Mean age at index instrumentation was 6.0 years (range 2.0 to 9.9)
- Mean follow up was 4.8 years (range 2 to 8)

Results

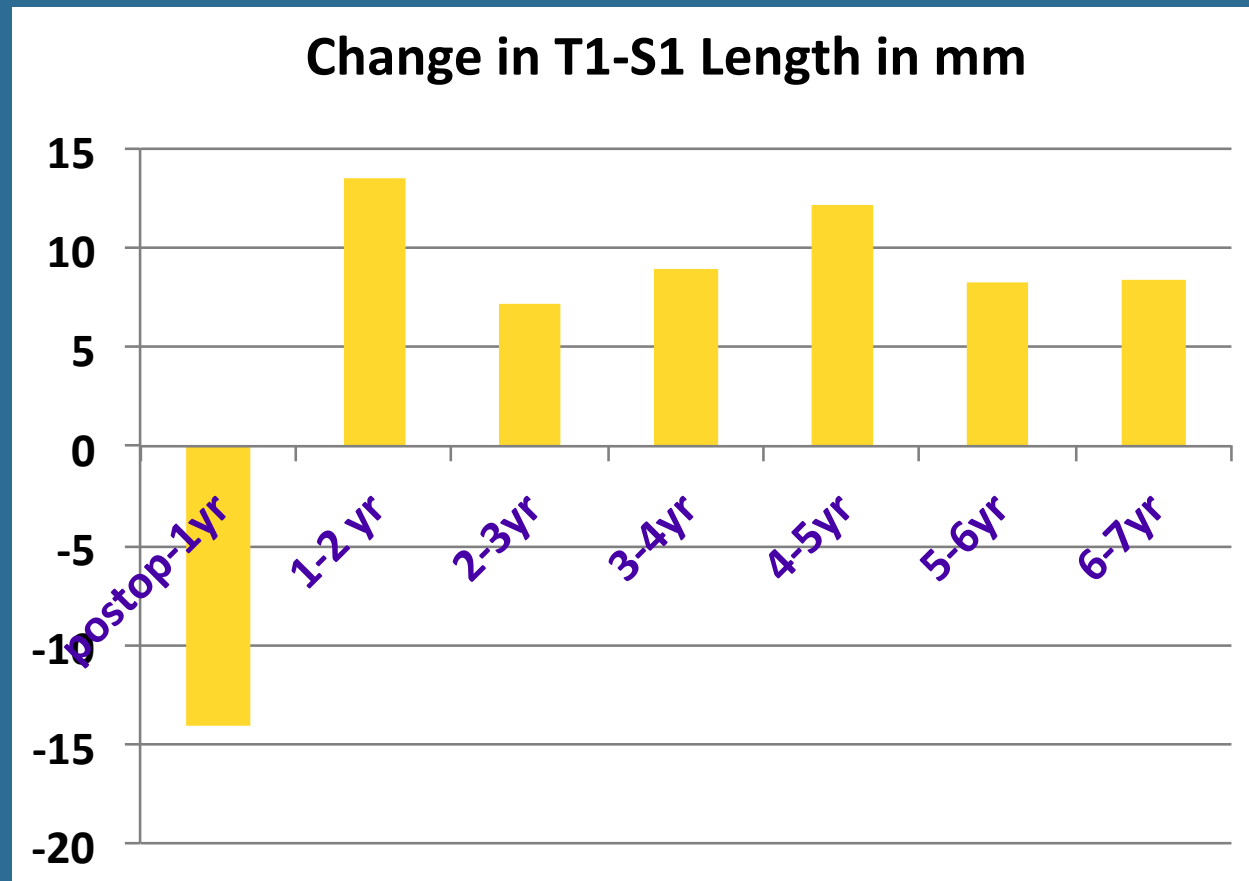
- Mean gain of 4.7 cm in T1-S1 length on postoperative radiographs from preoperative values
- At 1 yr, 73% (24/33) showed a **decrease** in T1-S1 length from postoperative values
- Mean T1-S1 length at 1 year was **1.4 cm less** than postoperatively



Results



Results

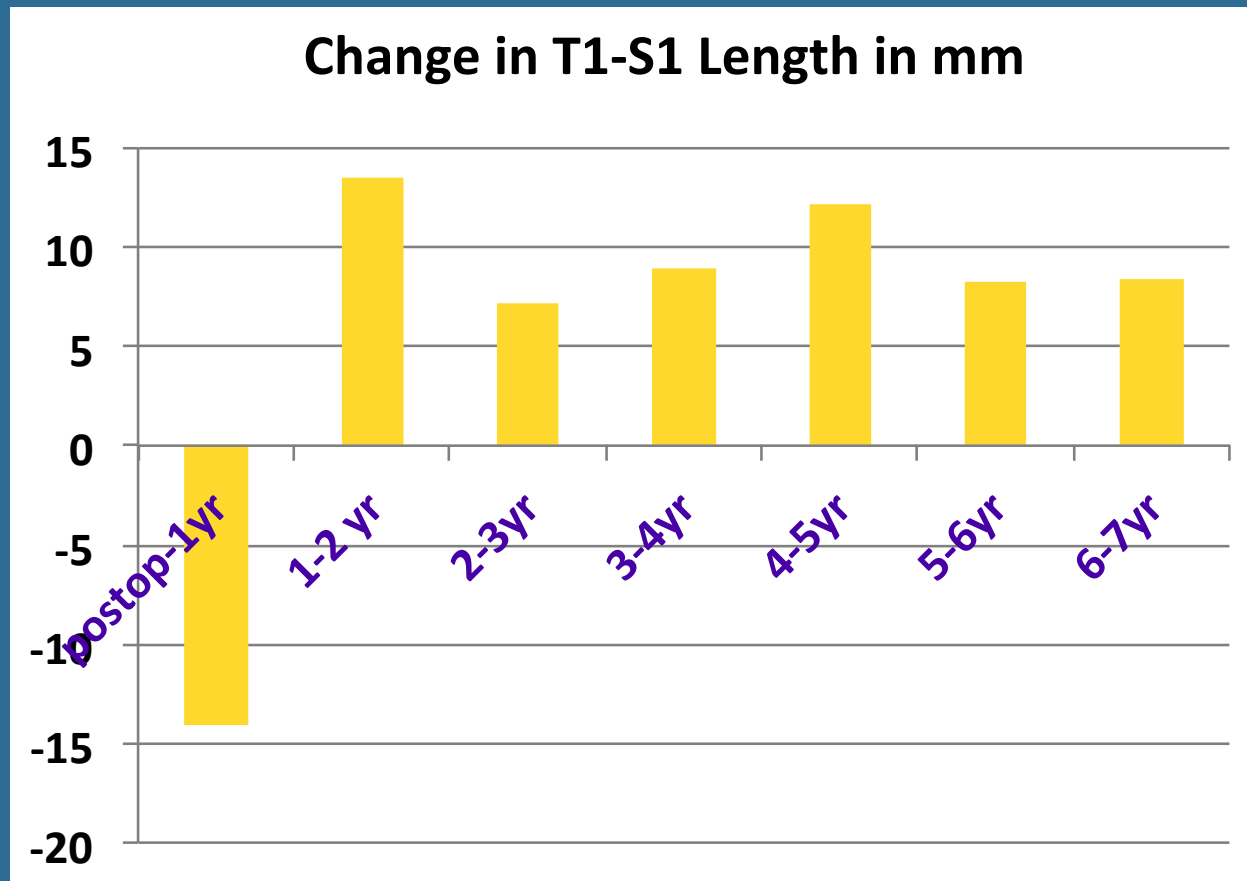


Results

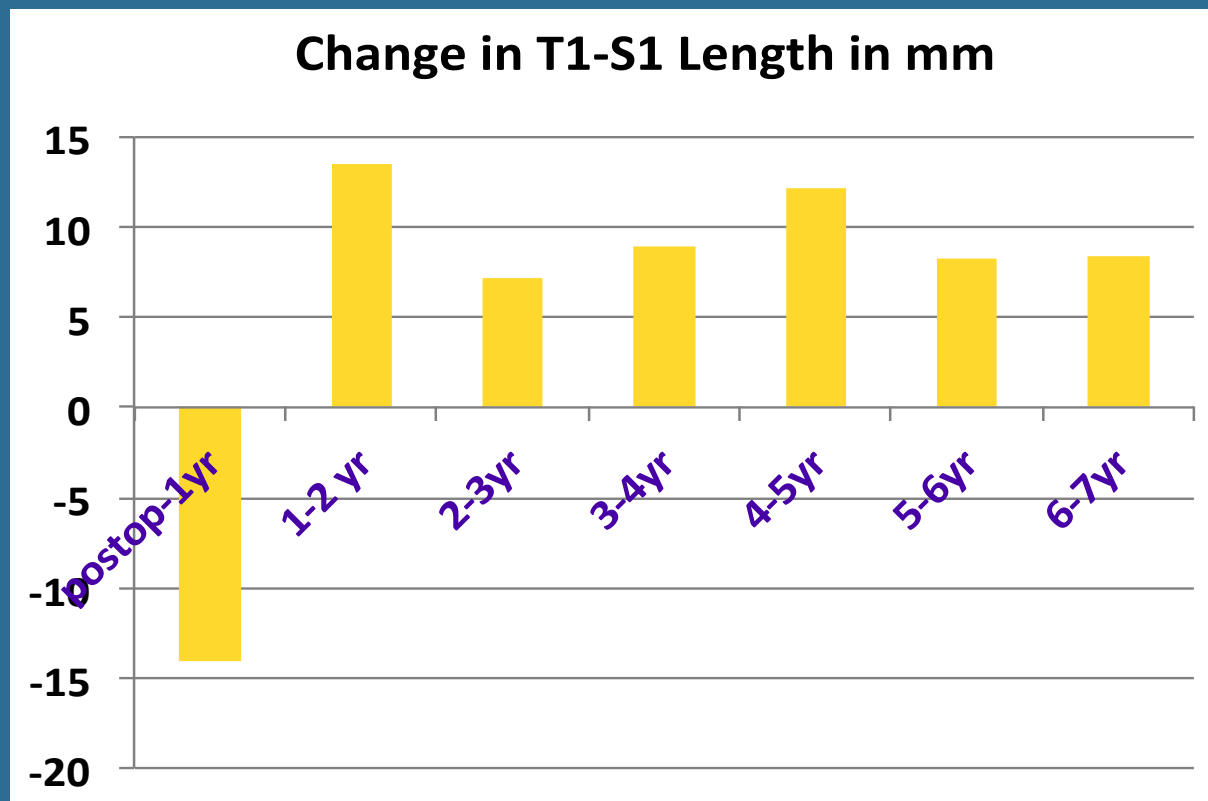
- Increase in T1-S1 length was statistically significant for years 2 through 5 ($p=0.003$, $p=0.02$, $p=0.006$, $p=0.005$)
- Similar increase was observed in years 6 through 8 but was limited by the small number of pts



Change in T1-S1 between year 1(a decrease)
and year 2 was significantly different ($p=0.0003$)



NO significant difference in the change in T1-S1 overtime for subsequent years ($p=0.21, 0.79, 0.78, 0.31, 0.91, 0.27$)



Discussion

Study Limitations

- majority of patients have not reached skeletal maturity or had a definitive fusion
- Retrospective
- Multicenter study
- Small number of patients

Conclusion

- With mean follow up of 5 years, annual increases in T1-S1 length were sustained
- The “law of diminishing returns” does not appear to affect Shilla constructs in the same manner
- Longer term follow up is needed to determine if this is truly a “law of continuing returns”