

CHILDREN'S ORTHOPAEDIC CENTER

#### Growth Guidance Constructs with Pedicle Screws Results in 1/5th of Normal T1-S1 Growth during the Growth Period

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#### Disclosures

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- b. Consultant
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# Background

 Guided growth constructs allows for continued growth without surgical lengthening



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ORIGINAL ARTICLE

A Comparison of SHILLA GROWTH GUIDANCE SYSTEM and Growing Rods in the Treatment of Spinal Deformity in Children Less Than 10 Years of Age

Scott J. Luhmann, MD\* †‡ and Richard E. McCarthy, MD§

	Guided Growth Construct	Growing Rods
T1-S1 height change	1.6 cm/yr	1.3 cm/yr



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### **Background - Growth Period**

	McCarthy et al. 2015 Guided Growth Series	Luhman et al. 2016 Guided Growth Series	Akbarnia et al. 2014 Growing Rod Series N=12	Dimeglio's Normal T1-S1 Growth
T1-S1 height change	N=40 8 mm/yr	N = 19 3.8 mm/yr	9.7 mm/yr	10mm/yr





### Purpose

To evaluate clinical outcomes in particular T1-S1 growth in patients with guided growth instrumentation independent of inventor's reports



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# **Methods**

- Retrospective review of EOS patients treated with guided growth constructs from 5 centers prior to final fusion
- Index instrumentation at < 10 years of age with</li>
  2 year follow up
- Patients with guided growth treatment reported in previous study or prior spinal instrumentation excluded





### Results

20 patients mean age at index: 5.7 years -Syndromic (N=9) -Neuromuscular (N=5) -Idiopathic (N=3) -Congenital (N=3) Mean radiographic follow-up: 5.1 years







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## **Results- Major Curve**

Guided Growth Patients (N=20)	Cobb
Pre-operative	<b>77</b> °
Post Index Surgery	<b>29</b> °
Final follow up	<b>45</b> °





#### **Results - Complications**

• 15/20 (75%) patients underwent a total of 24 revision surgeries

Events	Unplanned	
	Surgery	
16	14	
10	6	
4	3	
1	1	
3	0	hilo os .os
	Events	EventsUnplanned Surgery1614106431130

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### **Discussion**

	Our Guided	McCarthy et	Dimeglio's
	Growth	al. 2015	growth
	Study	Series	rates
	N=20	N=40	
T1-S1 height change during growth period	2.5 mm/yr	8 mm/yr	10mm/yr
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#### Conclusions

- T1-S1 growth during growth period
  - 1/5 predicted growth
  - 1/3 inventor's series
- Similar curve correction and complication rates compared to previous series



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#### References

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- 2. Andras, L.M., et al. Growing Rods Versus Shilla Growth Guidance: Better Cobb Angle Correction and T1-S1 Length Increase but More Surgeries. J Spine Deformity, 2015. 3: p. 246-252.
- 3. Akbarnia, B.A., et al. Dual Growing Rod Technique for the Treatment of Progressive Early-Onset Scoliosis. J Spine 2005. 30: p. 546-557.
- 4. Dimeglio, A, et al. The growing spine: how spinal deformities influence normal spine and thoracic cage growth.



	Our Guided Growth Study N=22	McCarthy et al. 2015 SHILLA Series N=40	Akbarnia et al. 2012 Growing Rod Series N=23
T1-S1 height change during growth period (mm/year)	2.5	8	12.1
Overall Cobb angle correction from pre-op to final follow-up (°)	-32	-30	-46
Total number of additional surgeries/patient	1.5	1.9	7.2



	T1-S1	Predicted	% Predicted
	Growth	Growth	Growth
	(mm)	(mm)	
CLA-39439-AD	-11.0	52.0	-21
CLA-40677-SN	16.3	110.4	15
CLA-40681-EM	0.9	57.2	1
CLA-41045-CC	6.9	117.6	6
CLA-41065-MM	63.5	112.0	57
CLA-41068-MP	20.0	65.6	30
CLA-41478-MR	5.9	62.4	9
CLA-41530-KS	4.8	71.0	7
CLA-41799-JR	12.3	52.4	24
CLA-41820-AH	-10.3	72.4	-14
CLA-41824-LS	28.0	47.0	60
CLA-50437-KD	14.5	124.2	12
HSJ-42228-FD	49.2	44.0	112
HSJ-42272-JS	<b>15.2</b>	34.0	45
HSS-39130-RK	81.2	123.0	66
NEM-35756-YN	13.0	26.0	50
NEM-39902-NN	6.0	37.0	16
RMC-35641-KG	-5.0	37.0	-14
RMC-39569-AH	-27.0	71.0	-38
RMC-41791-MM	-14.0	55.0	-25

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