



Washington University in St. Louis
ORTHOPAEDIC SURGERY

Radiographic Outcomes of Shilla Growth Guidance System and Traditional Growing Rods through Definitive Treatment

Scott J. Luhmann, MD

June C. Smith, MPH

Ann McClung, RN

Lynn McCullough

Richard E. McCarthy, MD

George Thompson, MD

Growing Spine Study Group





Introduction

- Luhmann, McCarthy (2013; in submission)
 - 19 Shilla vs 6 GR (unmatched; retrospective)
FDA data
 - >1 yr f/u

	Shilla	GR
Initial Cobb	70	68
Post-index Cobb	22	32
Final Cobb % improvement	41-53%	41-57%
Initial T1-S1	28.7 cm	29.0 cm
Final T1-S1	32.9 cm (+4.2 cm)	34.0 cm (+5.0 cm)
“Growth” T1-S1	0.14 cm/month	0.11 cm/month
Reoperations	1.5/patient	7.0/patient



Introduction

- Andras et al (2013; in submission)
 - 37 Shilla vs 37 GR (matched) from GSSG
 - >4 yr follow-up

	Shilla	GR
Initial Cobb	69	72
Post-index Cobb	26	38
Final Cobb	45 (-24)	36 (-36) p=0.019
Initial T1-S1	29.0 cm	26.5 cm
Final T1-S1	35.4 cm (+6.4 cm)	35.2 cm (+8.7 cm) p=0.013
“Growth” T1-S1	2.8 cm	7.4 cm
Reoperations	2.8/patient	7.4/patient



Study Purpose

- To compare the radiographic outcomes of patients who had undergone:
 - Shilla Growth Guidance System
 - Traditional Growing Rod (GR) treatment
- for management of early-onset scoliosis
through definitive treatment



Methods

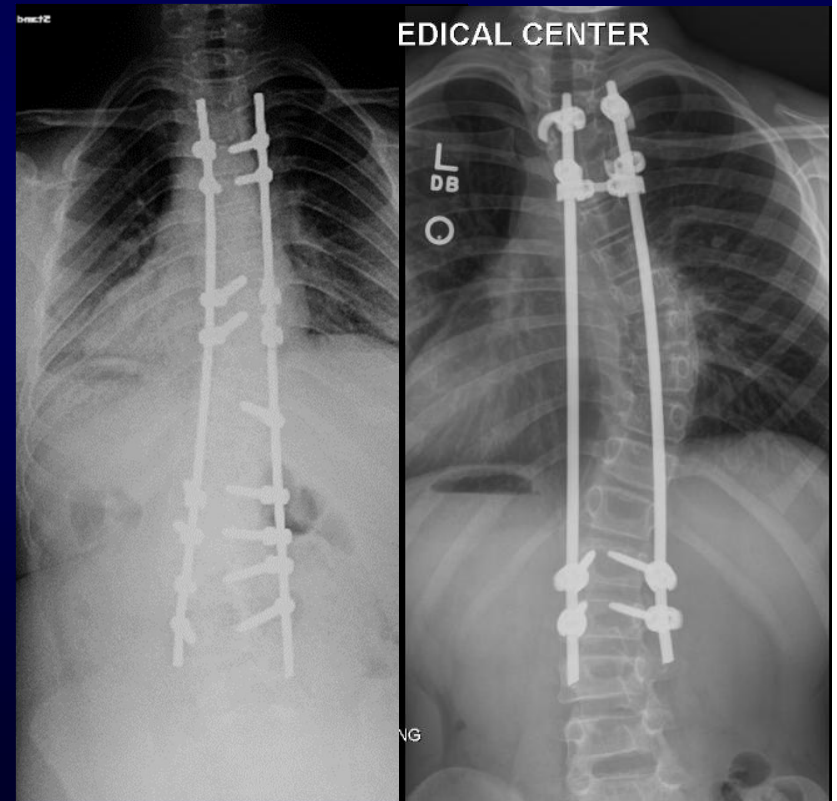
- A multicenter early-onset scoliosis (EOS) database (GSSG) was queried to identify patients who met the following criteria:
 - Surgical treatment with Shilla or GR
 - Undergone definitive treatment of the spinal deformity
 - Patients were matched by
 - Age
 - Pre-operative curve magnitude
 - Diagnosis



Methods

- The study population: 36 patients
 - 18 in Shilla group
 - 18 in GR group

<u>Diagnoses</u>	Shilla	GR
– Idiopathic	8	9
– NMS	7	7
– Syndromic	3	1
– Congenital	0	1





Methods

- Age at initial surgery was:
 - Shilla 7.9 y
 - GR 7.7y (NS)
- Length of follow-up after initial surgery:
 - 6.1 y for Shilla
 - 7.4 y for GR (NS)



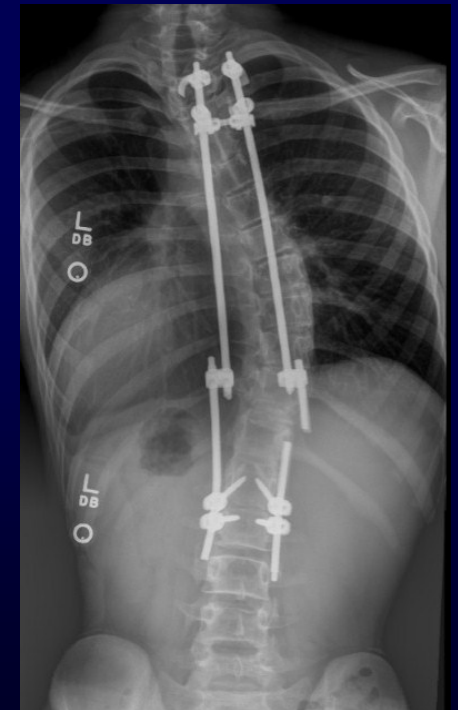
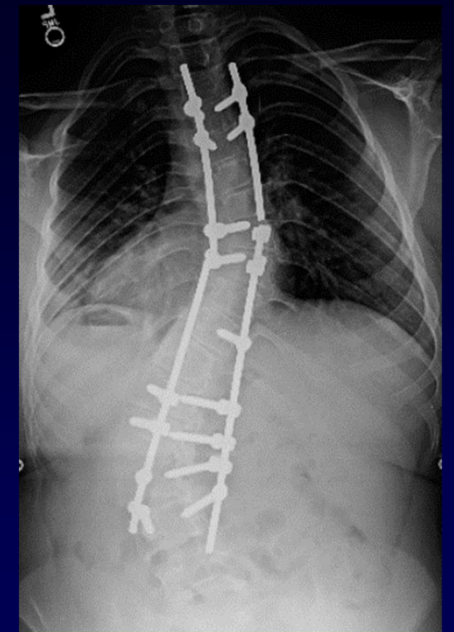
Results

- Definitive treatment:
 - Posterior spinal fusion: 15 Shilla, 17 GR
 - Implant removal: 3 Shilla
 - Completion of lengthenings: 1 GR
- Overall mean number of surgeries:
 - Shilla: 3.1 (range: 1-7)
 - GR: 9.3 (range: 4-24), including 5.8 lengthenings



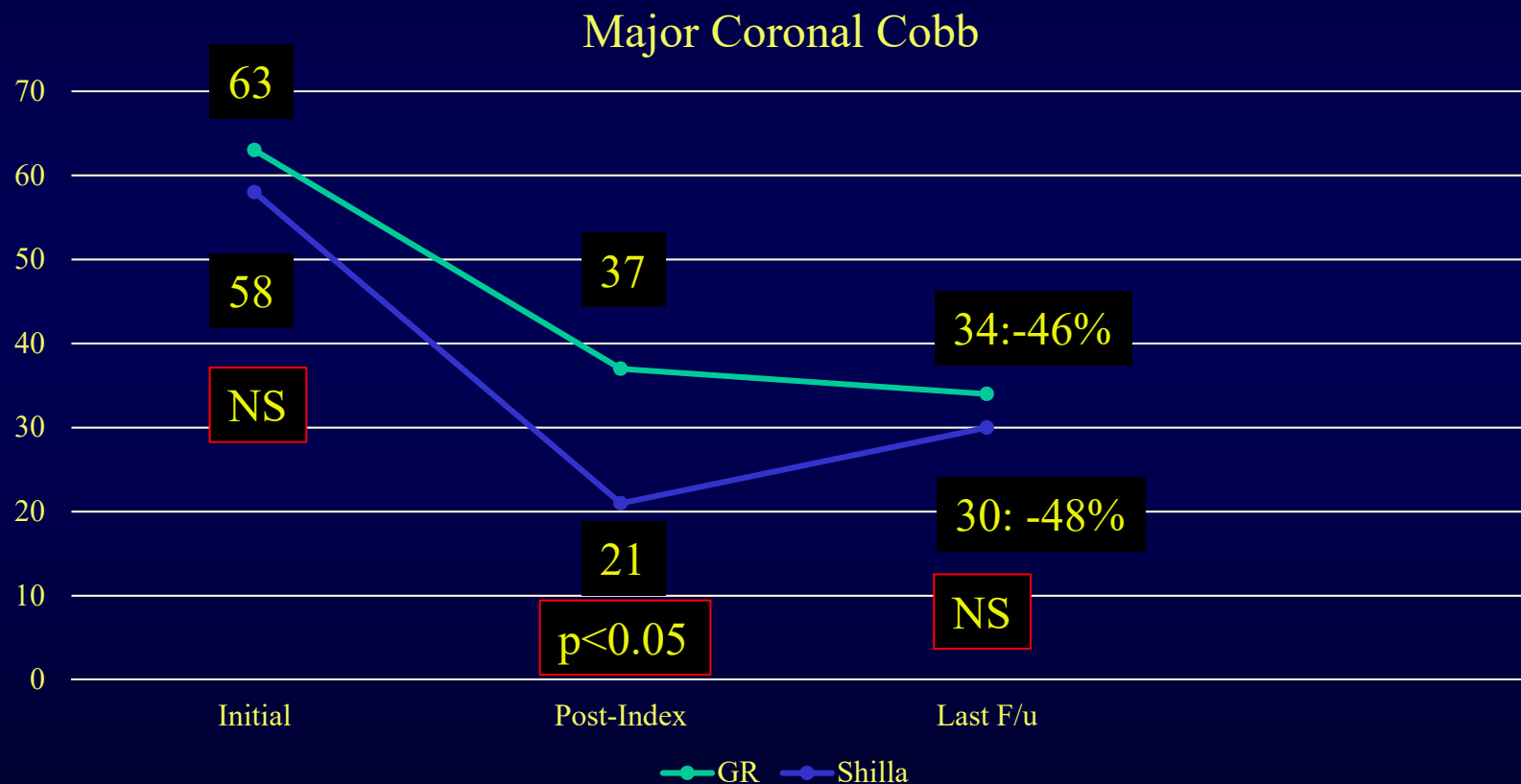
Results

- Total complications:
 - Shilla: 20 (mean 1.1/pt)
 - GR: 26 (mean 1.4/pt) (NS)
- Complication type
 - #1: Implant-related (Shilla 13; GR 11)
 - #2: Infection (Shilla 5, GR 7)





Results





Results

- T1-T12 length (mean)
 - Initial
 - Shilla: 195 mm
 - GR: 185 mm
 - Last follow-up
 - Shilla: 247 mm (52 mm increase)
 - GR: 233 mm (48 mm increase) (NS)



Results

- T1-S1 length (mean)
 - Initial
 - Shilla: 316 mm
 - GR: 292 mm
 - Last follow-up
 - Shilla: 406 mm (90 mm increase)
 - GR: 378 mm (86 mm increase) (NS)



Summary

- Reoperations: **3x** higher in GR group (3.1 vs. 9.3); 5.8 were lengthenings
- Complications: 1.1-1.4/pt (**NS**)
- Major Cobb: 46-48% improvement (**NS**)
- T1-T12: 48-52 mm increase (**NS**)
- T1-S1: 86-90 mm increase (**NS**)



Andras Study Comparison

This Study

Andras	Shilla	GR
Cobb Initial	69	72
Cobb Post-index	26	38
Cobb Final	45 (-24; -35%)	36 (-36; -50%) p=0.019
T1-S1 Initial	29.0 cm	26.5 cm
T1-S1 Final	35.4 cm (+6.4 cm)	35.2 cm (+8.7 cm) p=0.013
“Growth” T1-S1	2.8 cm	7.4 cm
Reoperations	2.8/patient	7.4/patient

Shilla	GR
58	63
21	37
30 (-28; -48%)	34 (-29; -46%) NS
31.6 cm	29.2 cm
40.6 cm (+9.0 cm)	37.8 cm (+8.6 cm) NS
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3.1/patient	9.3/patient



Conclusion

- In this analysis of EOS patients (matched by age, diagnosis and major Cobb magnitude) who had completed scoliosis treatment, the final radiographic outcomes (and changes) and complications (implant-related and infection) between the Shilla and GR groups, were not statistically different.
- The main differences between the groups was the 3-fold difference in overall surgeries between the two groups.



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Thank You

