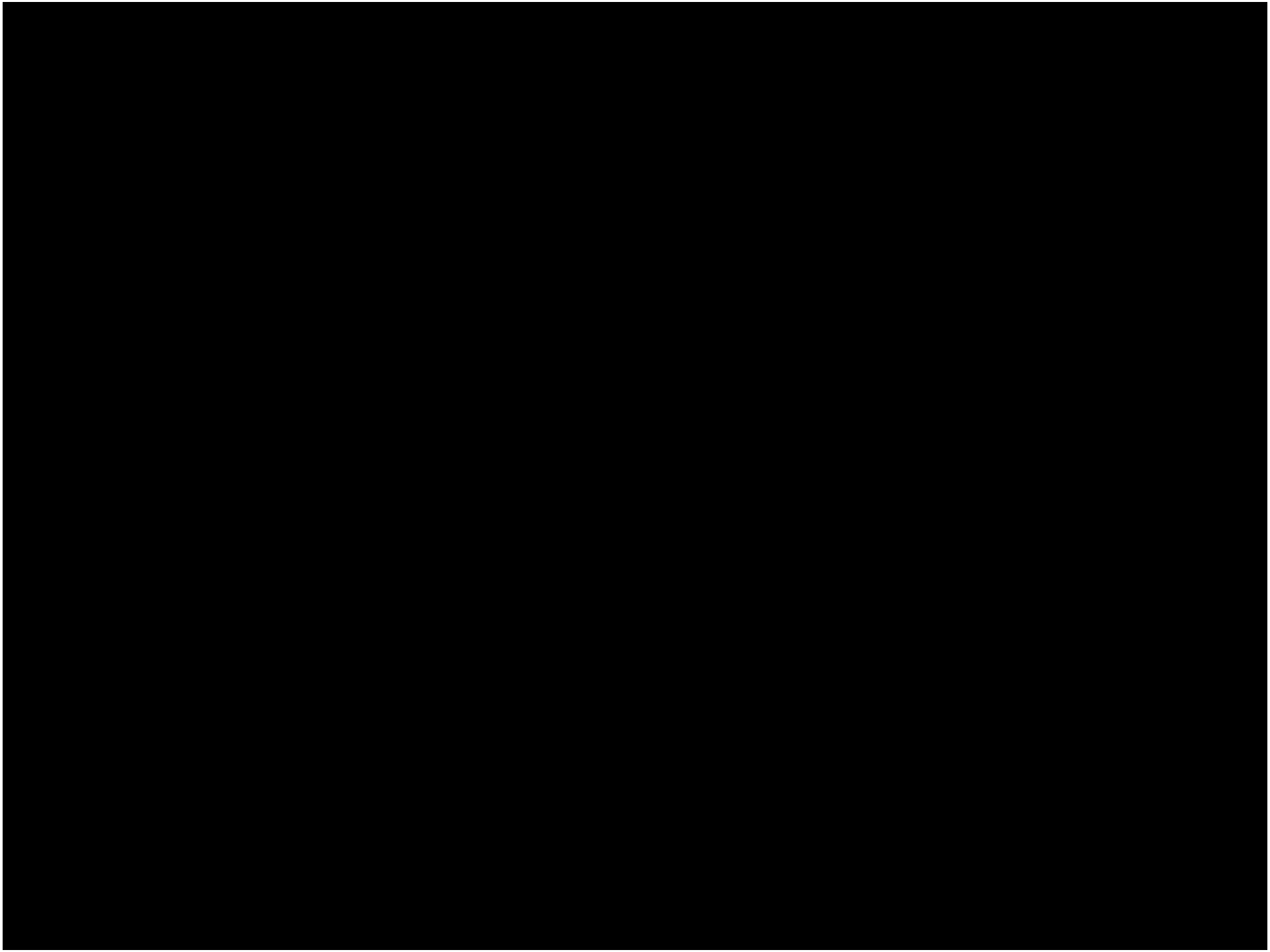
SHILLA VS GROWING RODS: GROWTH AND COMPLICATIONS

LINDSAY ANDRAS MD
ELIZABETH JOINER BS
RICHARD MCCARTHY MD
SCOTT LUHMANN MD
DAVID SKAGGS MD

USC University of Southern California
Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER



Disclosures

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

Lindsay Andras, MD

None

Elizabeth Joiner

None

Richard McCarthy, MD

Medtronic (b,d,e), Synthes (b)

Scott Luhmann, MD

Medtronic Sofamor Danek (a, b); Watermark Research (b); Globus Medical(e); Medtronic Sofamor Danek (d); Stryker(d)

David L. Skaggs, MD

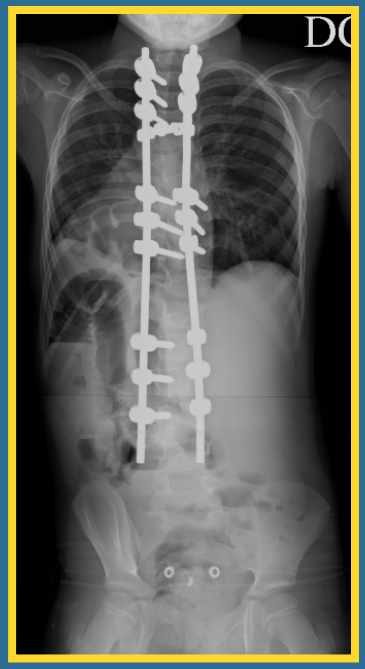
Medtronic (b,d,e); Stryker (d); Biomet (b,d,e)

USC University of Southern California

Children's Hospital Los Angeles
CHILDREN'S ORTHOPAEDIC CENTER

Shilla – Growth Guidance System

- Dual Rod Construct
- Limited fusion at Apex
- Shilla screws at end that slide along the rods
- Allows continued growth without surgical lengthening

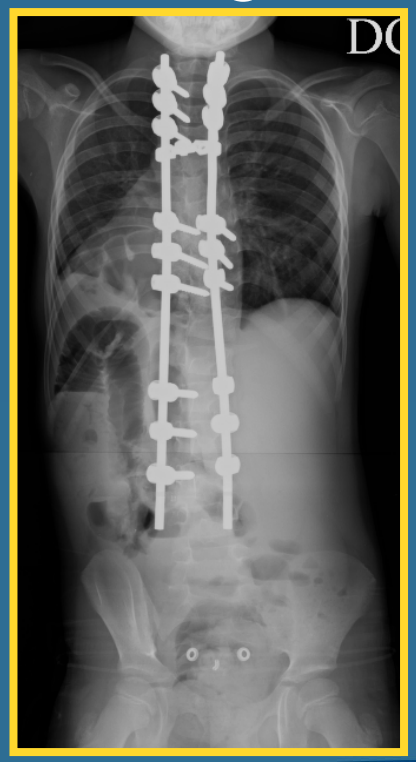


USC University of Southern California

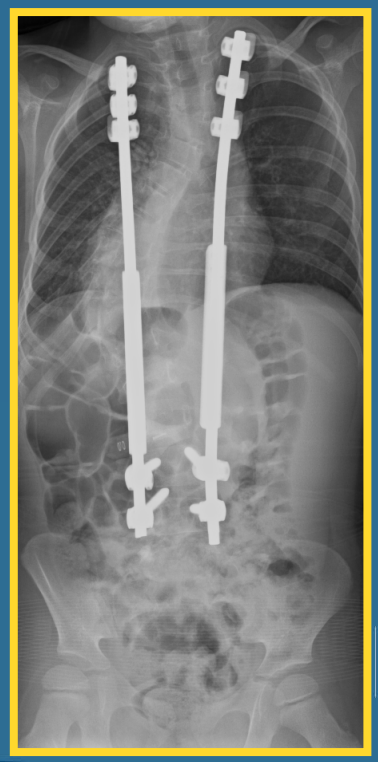
Children's Hospital Los Angeles
CHILDREN'S ORTHOPAEDIC CENTER

Study Purpose

To evaluate the outcomes and complication rates of the Shilla system and compare with distraction based growing rod instrumentation



VS



Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER

Materials and Methods

Multicenter retrospective review

Arkansas 25, CHLA 7, Wash U 2

Inclusion criteria:

- Diagnosis of early onset scoliosis
- Shilla instrumentation
- Minimum two year follow up

Exclusion criteria:

- Prior instrumentation

USC University of Southern California

Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER

Results

34 patients met the inclusion criteria

- Mean age at index surgery was
  6.9 years (2.0 -11.8 years)

- Mean radiographic follow up was
  4.7 years (2.6 - 7.4 years)

Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER

Results: Mean Cobb Angle

	Degrees
PREOPERATIVE	67 (range 40-115)
POSTOPERATIVE (After Index Surgery)	25 (range 5-47)
FINAL FOLLOWUP	41 (range 15-71)

Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER

Results: Mean T1-S1 Length

	Centimeters
PREOPERATIVE	29.9 (range 20.9 – 40.7)
POSTOPERATIVE (After Index Surgery)	33.4 (range 25.4-42.6)
FINAL FOLLOWUP	36.8 (range 29.1-53.1)
Increase during "growth" period	3.5 (range 0-11.1)

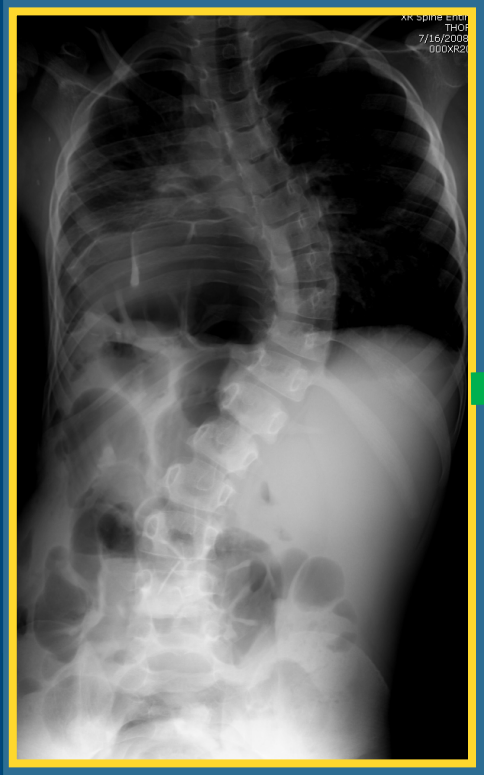
Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER

Results: Complications

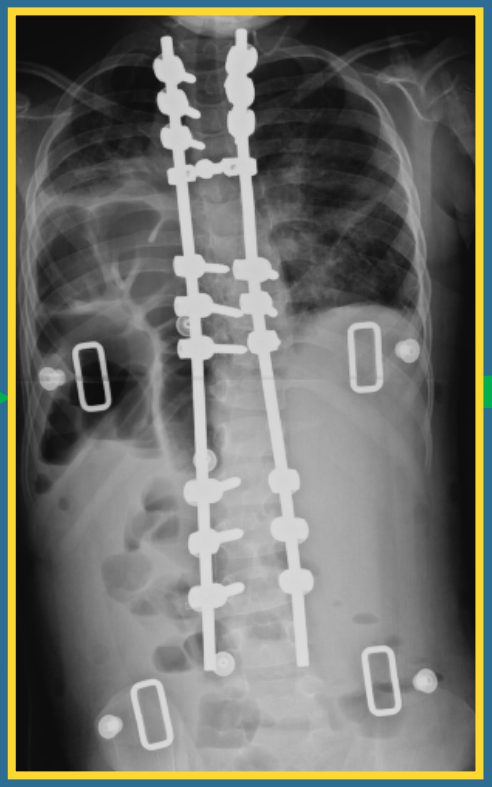
- No Neurologic complications
- 23/34 patients (68%) had at least one complication
- 53 Unplanned surgeries=160% ccx rate

USC University of Southern California | Children's Hospital LOS ANGELES CHILDREN'S ORTHOPAEDIC CENTER

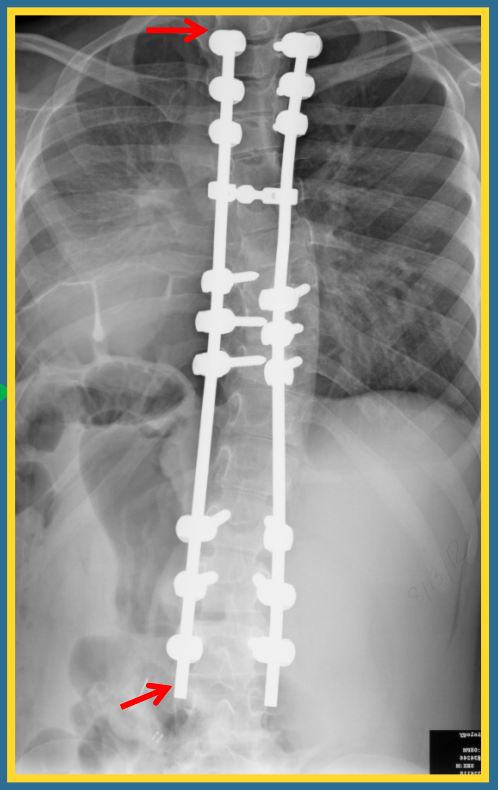
Results



PREOPERATIVE



POSTOPERATIVE



FINAL FOLLOWUP

USC University of Southern California

Children's Hospital LOS ANGELES

CHILDREN'S ORTHOPAEDIC CENTER

Discussion:

Increase inT1-S1 length during "growth" period

	Average total T1-S1 increase during growth period (cm)	Average follow up (yrs)	Average increase in T1-S1 per year (cm/yr)
SHILLA	3.5	4.7	0.74
DUAL GROWING RODS (Sankar et al; Spine 2011)	5.0	3.3	1.52

USC University of Southern California | Children's Hospital LOS ANGELES CHILDREN'S ORTHOPAEDIC CENTER

Discussion: Complications requiring surgical intervention

	Complications/patient
SHILLA	1.6
DUAL GROWING RODS (Bess et al; JBJS 2010)	0.46
DUAL GROWING RODS (Sankar et al; Spine 2010)	2.3

USC University of Southern California

Children's Hospital LOS ANGELES
CHILDREN'S ORTHOPAEDIC CENTER

Discussion: Total Number of Surgeries

	Total surgeries/patient
SHILLA	2.6
DUAL GROWING RODS (Bess et al; JBJS 2010)	6.6
DUAL GROWING RODS (Sankar et al; Spine 2010)	7.3

USC University of Southern California

Children's Hospital Los Angeles
CHILDREN'S ORTHOPAEDIC CENTER

Conclusion

Comparing this preliminary data on the Shilla construct to historical data on dual growing rods

Less than half surgeries

Similar complication rate

Less increase in T1- S1 length

USC University of Southern California

Children's Hospital Los Angeles
CHILDREN'S ORTHOPAEDIC CENTER

Next Year…
36 Case Matched Controls
SHILLA Vs Growing Rods

	Growing Rod	Shilla	P- value
Total # of surgeries per patient	7.0	**2.8**	<0.001
Average change in cobb angle	**-36 degrees**	-23 degrees	0.019
Average change in T1-S1	**8.5 cm**	6.4 cm	0.031

USC University of Southern California

Children's Hospital Los Angeles
CHILDREN'S ORTHOPAEDIC CENTER

Thank You

ORTHOPAEDIC CENTER