Early Results Of The Shilla Growth Guidance Technique For Early Onset Scoliosis

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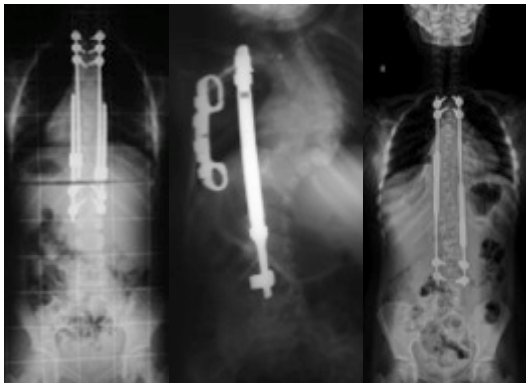
Growth-sparing Surgical Techniques

New Growth Modulation Technology

Forces Applied

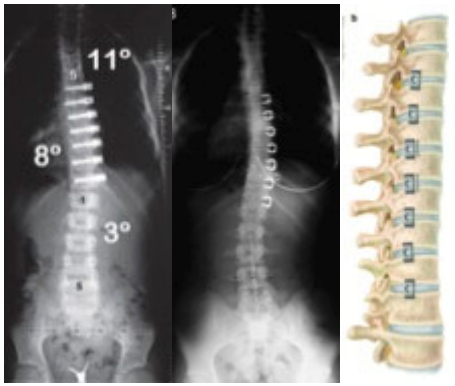
Posterior implants



Concavity
Distraction

Convex
Tether

Anterior implants



Active

Passive

Growth & correction

Classification of Growth Friendly Techniques (Non-fusion Techniques)

Distraction Based Systems

<8 y, all etiology

- Growing Rod
- VEPTR
- MCGR

Posterior Guided Growth

<9-10 y, all etiology

- **Shilla**
- Luque trolley

Compression Based Systems (Tether)

≥8 y, congenital Ø

- Stapling
- Tethers

Skaggs, Witale et al

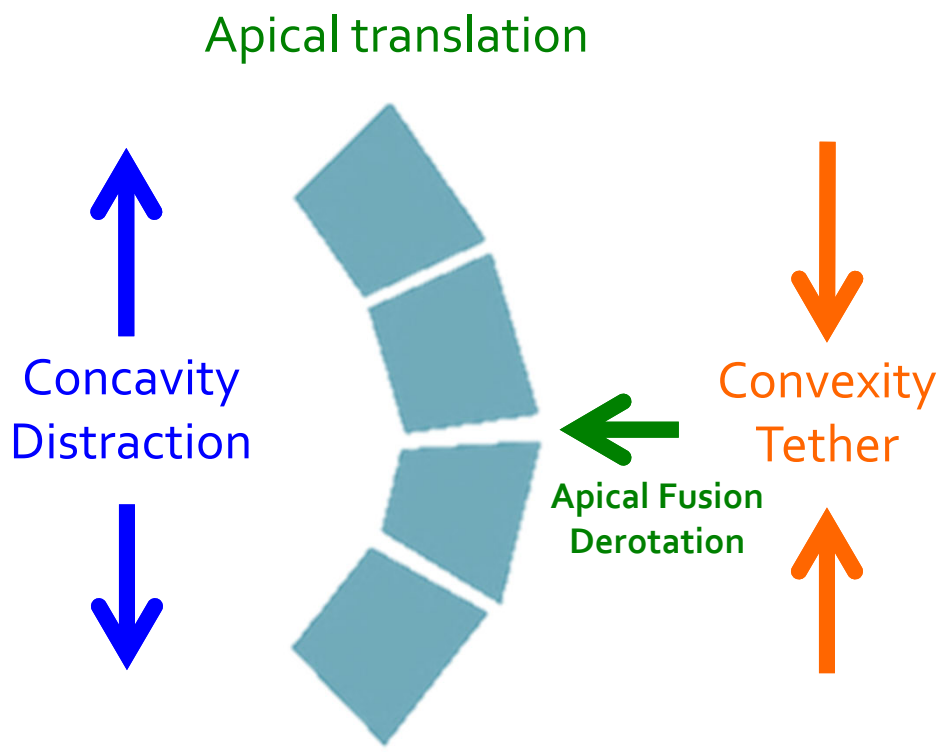
Growth Guidance Technique - Shilla

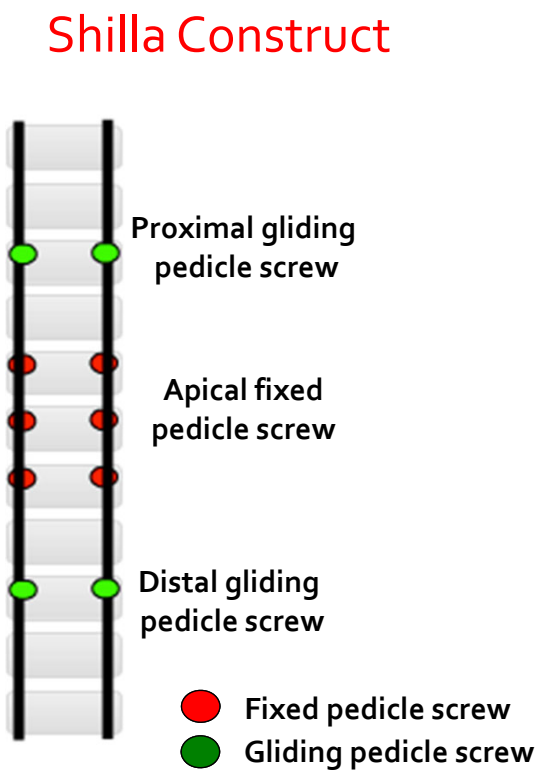
Posterior Guided Growth

<9-10 yr, all etiologies

Shilla

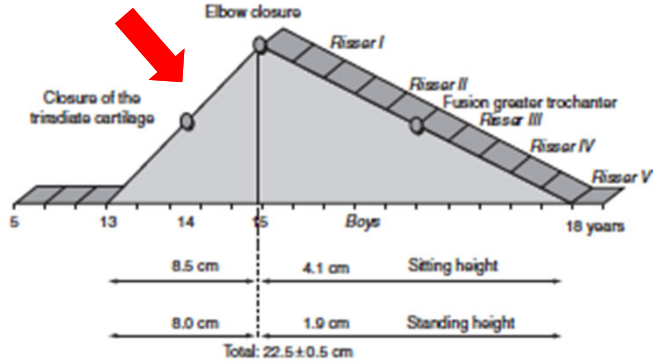
Shilla growth guidance technique is one of the growth friendly techniques that are described to control the development of the deformity without impairing the spinal growth, in the treatment of early onset scoliosis (EOS).





Purpose

- In the spine surgery directing the growth
  - The purpose is to increase
    - the length of the spine
    - the movability of the spine
    - the thoracic function of it
  - and to decrease
    - the number of surgeries
    - risks



Spinal Growth Modulation: Second growth spur

- In our study, we aimed to present the early results of the Shilla in patient with insufficient conservative surgical treatments having EOS

Yazıcı M, Emans J: Fusionless instrumentation systems for congenital scoliosis: Expandable spinal rods and vertical expandable prosthetic titanium rib in the management of congenital spine deformities in the growing child. Spine 2009;34(17):1800-1807

Spinal Growth Modulation: Shilla

Locked pedicule screws to apical vertebra

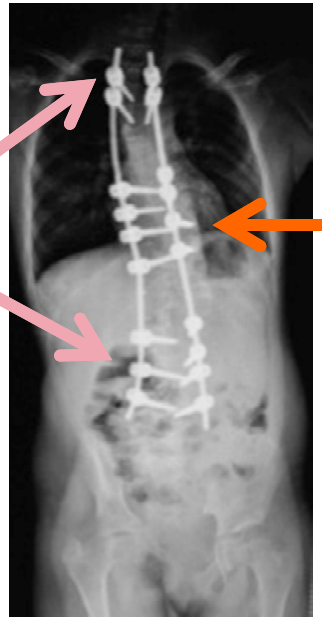
- The rotation is corrected, the rods are locked, and fusion applied

Un-locked pedicule screws to distal and proximal vertebra are applied

- They are fixed subperiostally and rods are left movable inside

Gowth guidance pedicle screw:

- Fusion Ø (≈2 segments)
- Preserved facet joints and subperiostal tissue
- As multiaxial sliding rod



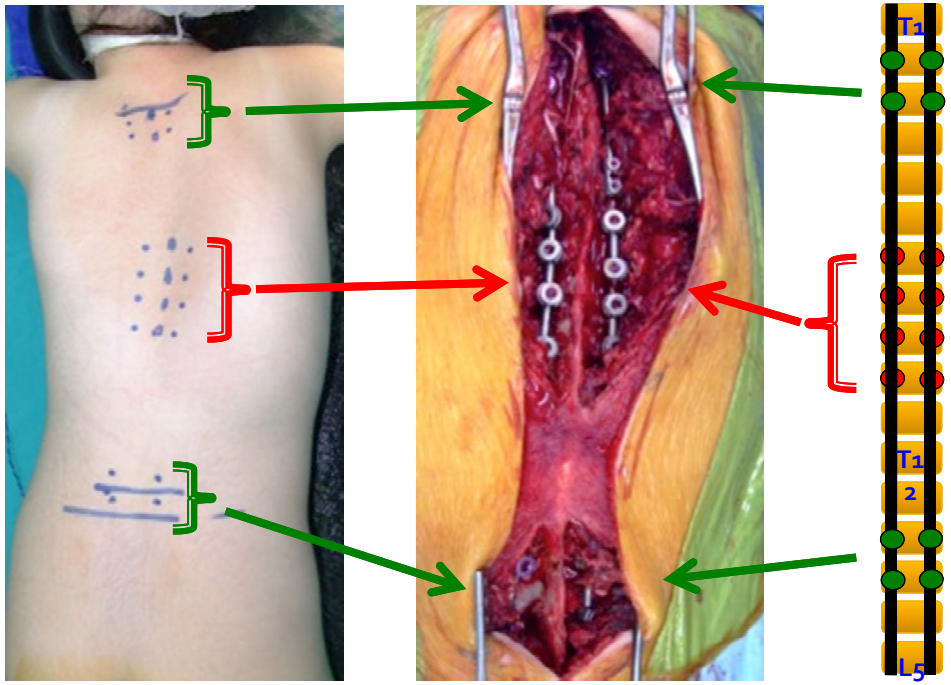
Locked pedicule screw:

- Fusion + (≈3 segment)
- Compretion, Distraction, Derotation

Richard McCarthy

Method

- 7 patients (6 F, 1 M)
  - Open triradiate cartilage, Risser 1≥
  - AP Cobb angle ≥50°
  - Age 10.2 (10-11)
  - Failed Previous treatment
- Etyology
  - Idiopathic (3)
  - Congenital (2)
  - Neuromuscular (Tumor) (1)
  - Down syndrome (1)
- Preoperative X-ray, MRI, and 3DCT
- Neuromoniterisation (SSEP and MEP)
- Surgery 3.5 h
- Postoperative 3 m with TLSO brace
- Length of the hospital stay 5.6 d (4-7)
- FU @ 7.2 m (1.5-14)

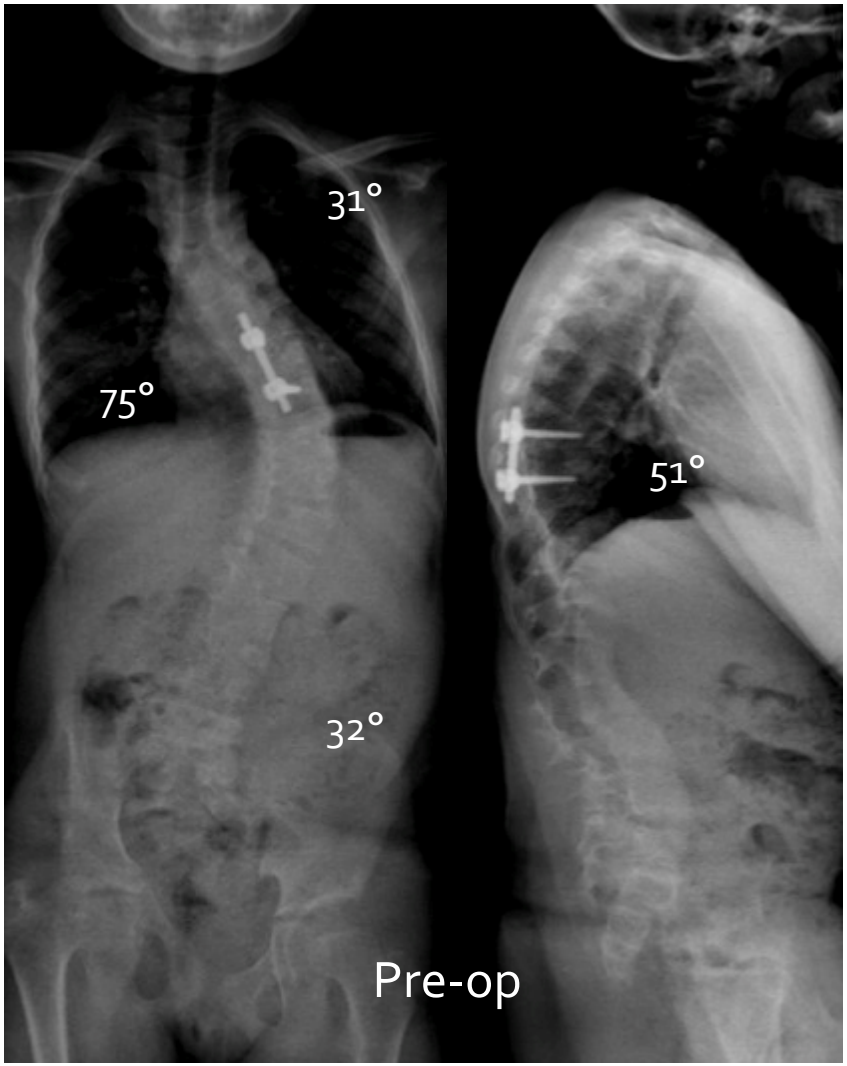


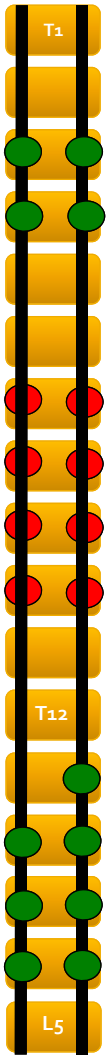
RESULTS

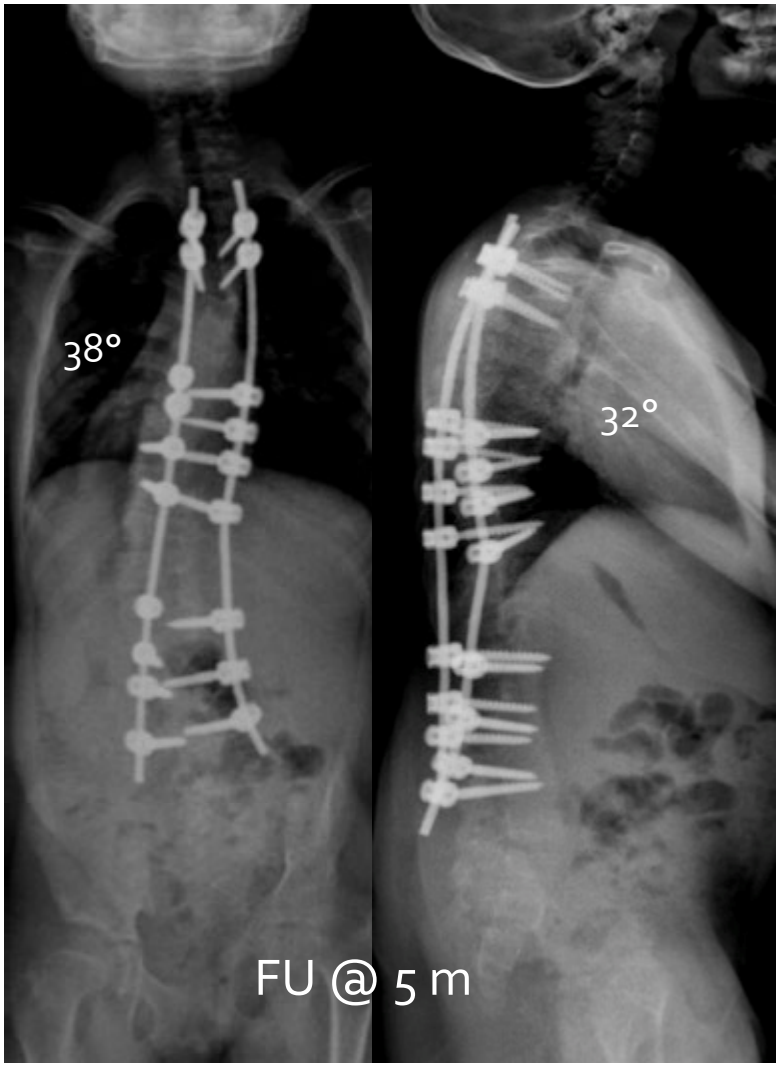
	Coronal Cobb (Major Curve)	Coronal Cobb (Minor Curve)	Sagittal (Kyphosis) Cobb	Sagittal (Lordosis) Cobb
Preoperative	69.4° (54-100°)	60° (18°-53°)	63.8° (33°-87°)	50.5° (0-74°)
Last control	28.7° (7.5°-50°)	20.9° (7°-28°)	30.5° (15°-44°)	31.5° (6°-39°)
Correction	58.6%	65.2%	52.2%	37.6%

No	Sex	Etiology	Risser / Y Cartilage	Age of Surgery time (y)	Duration of Surgery (h)	Hospital stay (d)	FU (m)	AP-Preop Cobb	AP-Postop Cobb	LAT-Preop Cobb (K/L)	LAT-Postop Cobb (K/L)
1	F	Congenital	0 / Open	10	3.45	7	5	34°/66°	27°/38°	51°/0°	32°/6°
2	F	Down Syndrome	0 / Open	10	3	7	12	55°/18°	35°/15°	33°/21°	15°/17°
3	M	Idiopathic	1 / Open	11	6	4	14	100°	50°	87°/62°	44°/39°
4	F	Neuromuscular	1 / Open	10	6.15	4	13	25°/57°	24°/28°	67°/66°	34°/39°
5	F	Idiopathic	0 / Open	9.8	4	5	3	54°/52.5°	22°/28°	68°/70°	33°/44°
6	F	Idiopathic	0 / Open	9	1	7	2	46°/71°/33°	27°/26°/8°	54°/67°	36°/41°
7	F	Congenital	1 / Open	12	5.30	6	1.5	53°/80°	35°/21°	79°/61°	21°/39°
				10.25	4.1 (1-6.15)	5.6 (4-7)	7.2 (1.5-14)				

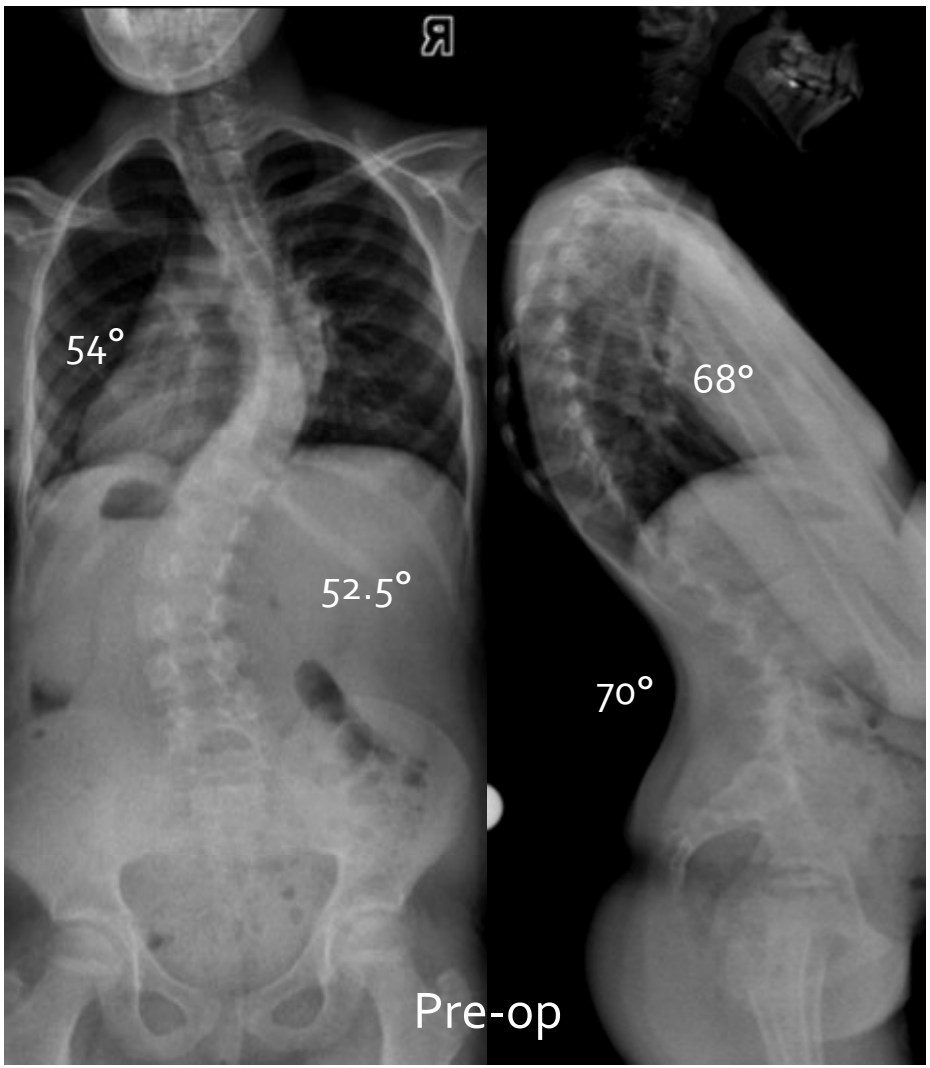
EOS (Congenital Scoliosis)
F / Age @ 10 y

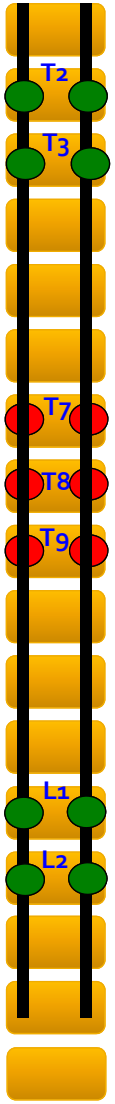


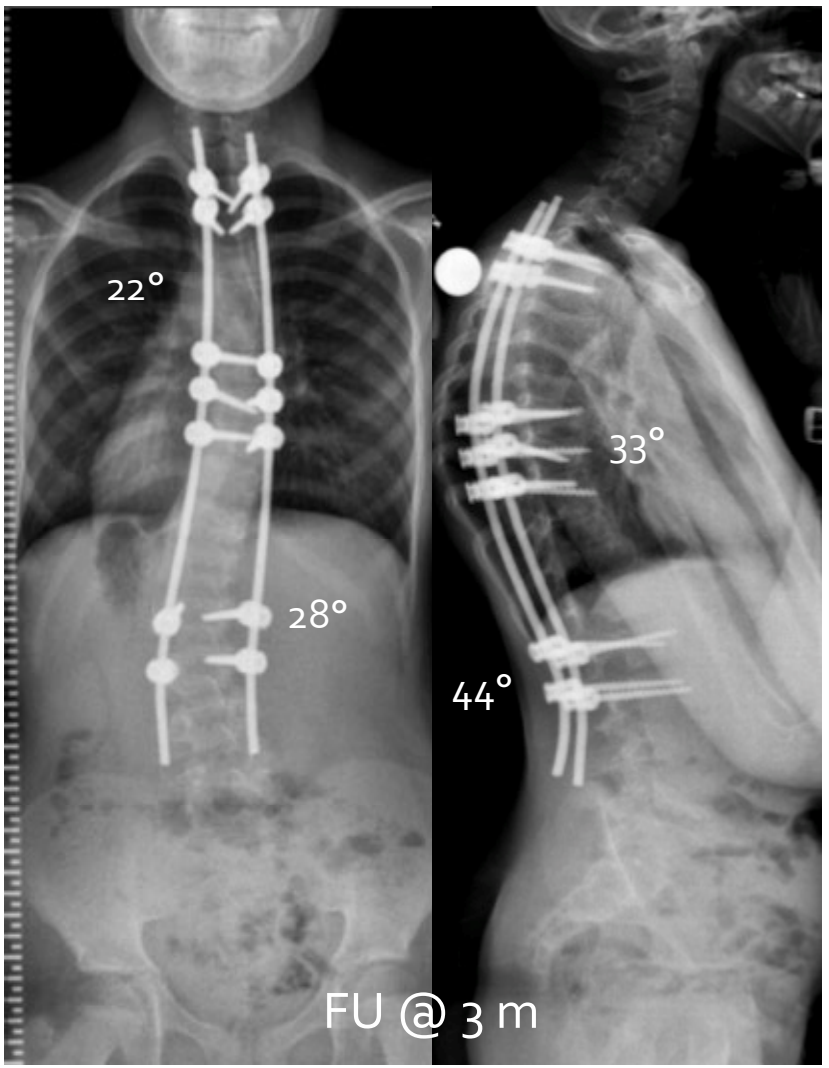




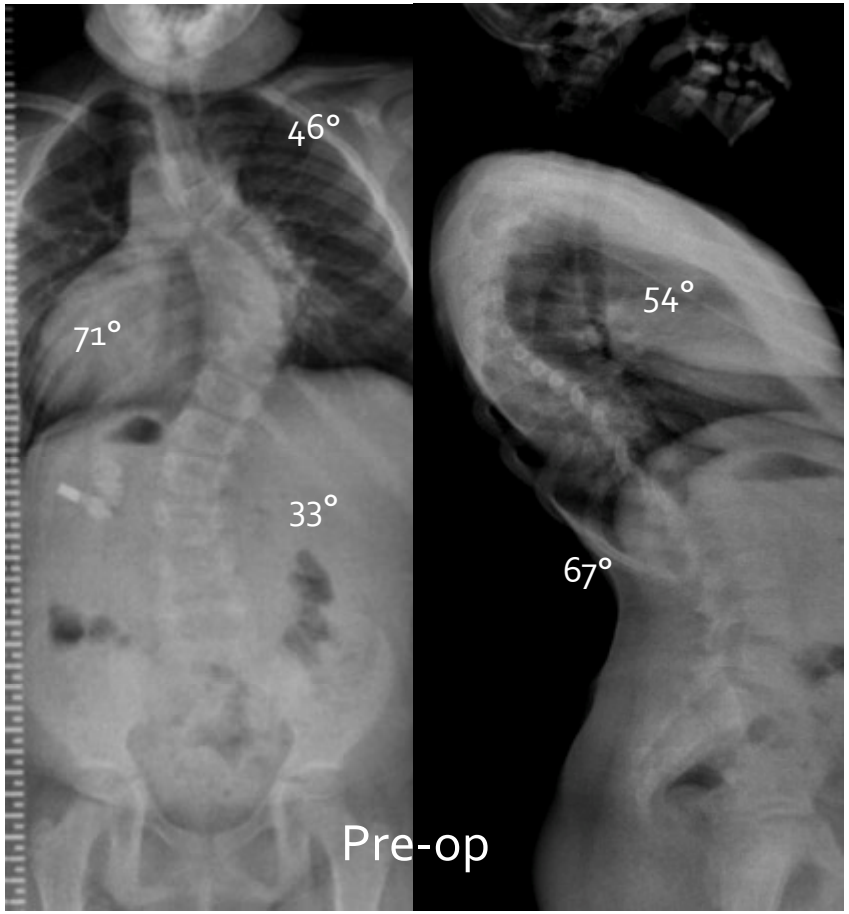
EOS (Idiopathic Scoliosis)
F / Age @ 9+8 y

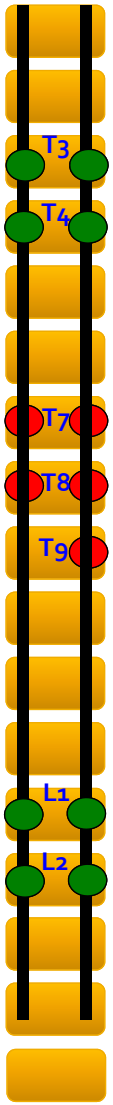


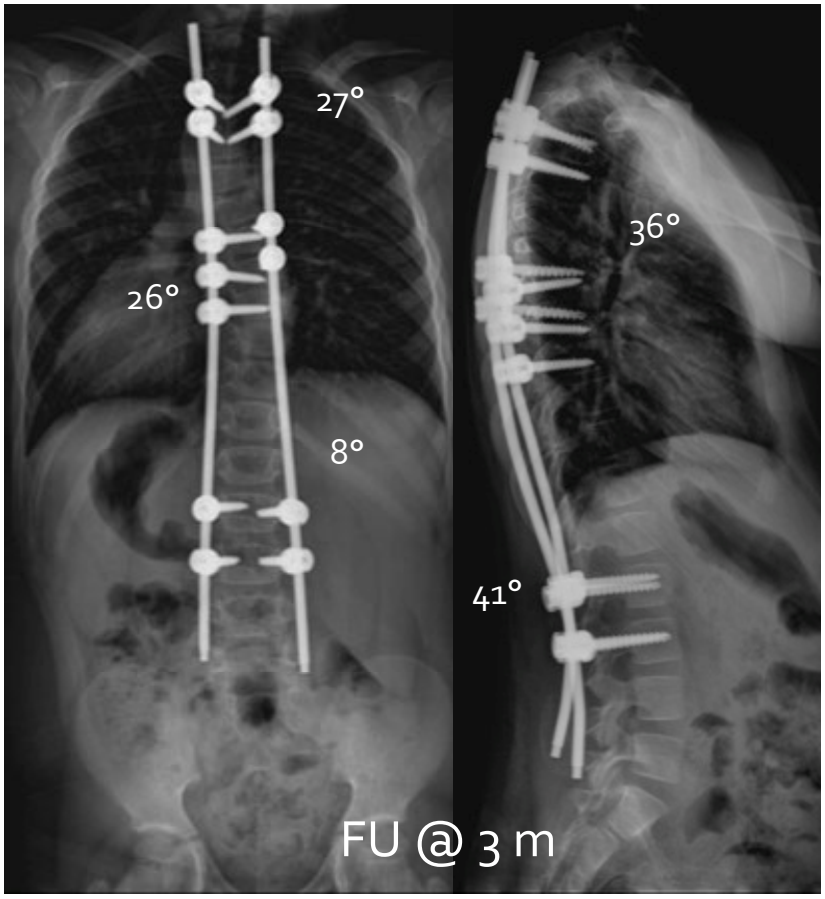




EOS (Idiopathic Scoliosis)
F / Age @ 9 y







Results

- **Problems due to repetitive surgeries constitute important problems**
- **With the application of Shilla technique in convenient patients**
  - *The spine growth may be maintained*
  - *The apical vertebra rotation can be corrected*
  - *The number of repetitive surgeries can be decreased*
- **The limitations of our study**
  - *The number of patients was less.*
  - *The application was in a relatively late age*
  - *The follow-up period was short*
- **The Shilla technique needs to be evaluated using a higher number of patients with a longer follow-up period**