Limited Anterior Spinal Fusion: An Effective Strategy in Controlling Progressive Early Onset Scoliosis

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Disclosure statement

• Burt Yaszay	(a,b,d,e) DePuy Synthes Spine; (a,b) Ellipse; (a,b) K2M; (a) KCI; (b) Medtronic (e) OrthoPediatrics;
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• Carrie Bartley	No Relationships
• Peter Newton	(a,b,d,e) DePuy Spine; (a) Axial Biotech; (a) EOS;(c) Nuvasive

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

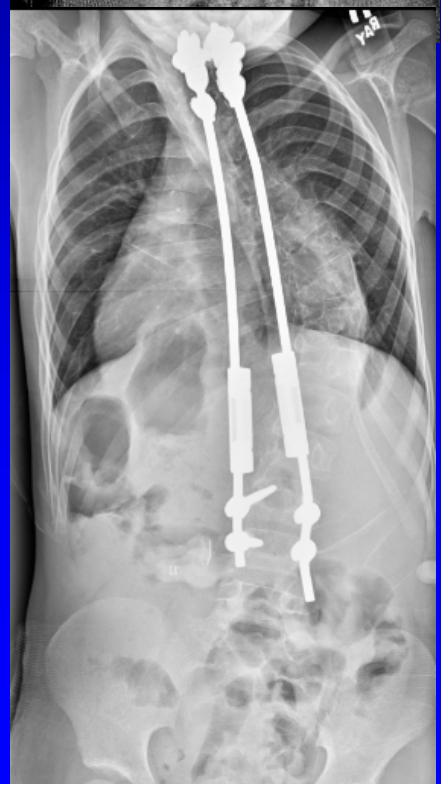
Introduction

- **Early Onset Scoliosis → challenge**

- **Treatment Goals**
  - Control spinal deformity
  - Maximize spinal (chest)growth
  - (?) maximize/maintain lung fxn
  - Minimize treatment morbidity

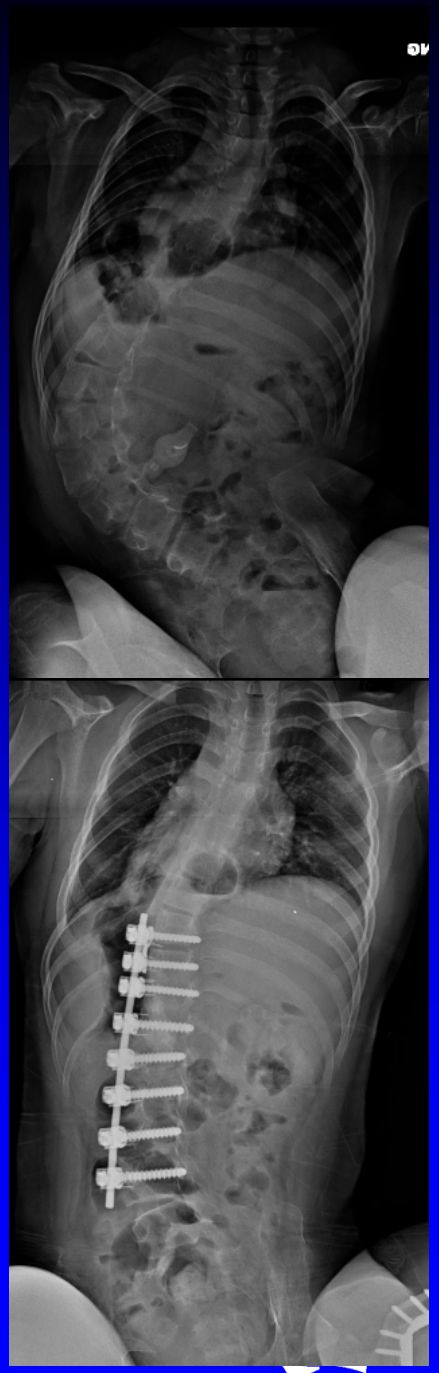
Treatment Options

- **Non-surgical Management**
  - Brace
  - Casting
- **Surgical Management**
  - Growing Rods, VEPTR
  - Shilla
  - **Limited ASF fusion**



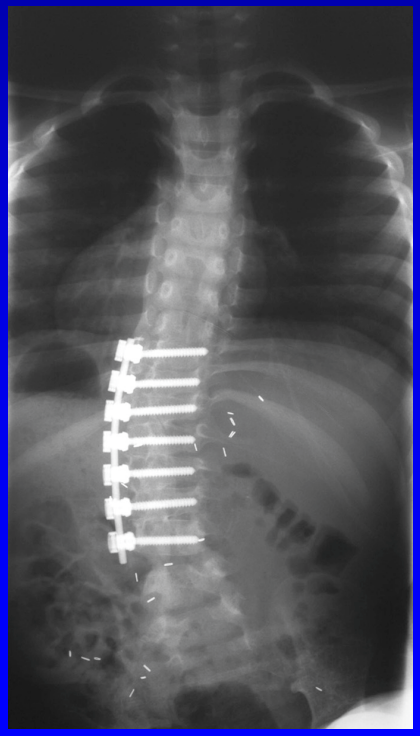
Limited Fusion

- Thoracolumbar curves
- Limit fusion of thoracic vertebra
- Temporizing until long posterior fusion can be done



Objectives

- The purpose of the current study was to evaluate the utility of limited ASF in controlling EOS (and postponing a definitive management).



Materials and Methods

- **Retrospective review**
- **EOS pt with limited ASF**
- **Minimum f/u - 2 yr**
- **Surgical and Radiographic data was recorded**

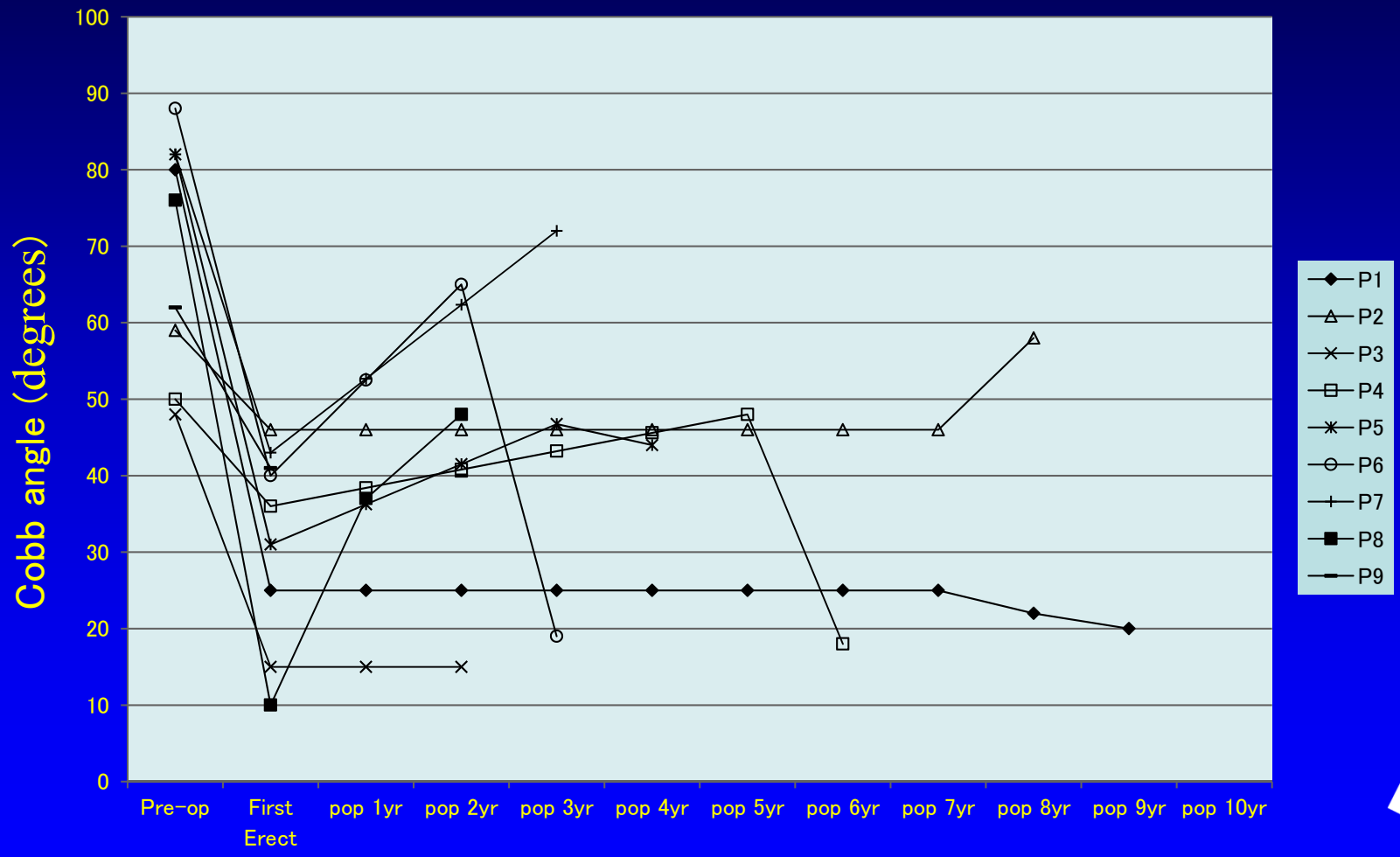
Results

- 9 patients identified (4 M, 5 F)
- Mean age was 6.6 years (range 2–9 yrs).
- Average f/u was 4.5 years (range 2–9 yrs).
- Diagnoses:
  - neuromuscular scoliosis (6)
  - neurofibromatosis (2)
  - congenital scoliosis (1).

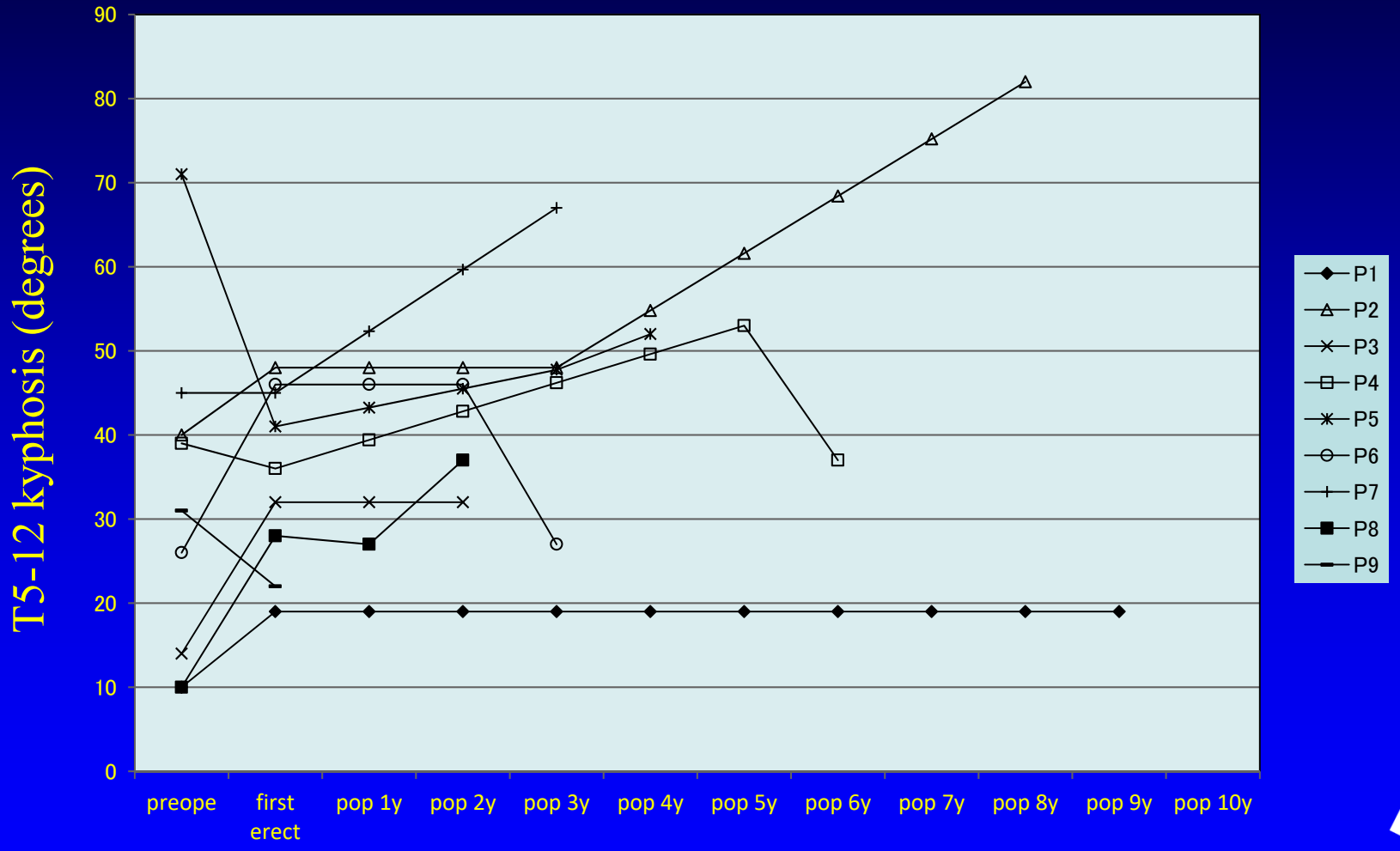
Results

	preoperation	1st erect	postoperation (final follow-up)
mean Cobb angle	69 ± 16°	32 ± 13°	46 ± 18°
T5-12 kyphosis	27 ± 13°	31 ± 13°	50 ± 47°
average correction rate (%)		51%	32%
average number of fused levels	6 ± 1		
EBL	278 ± 128cc		
subsequent PSF after initial ASF (N)	2/9 (22%)		
Average time between initial ASF and subsequent PSF	3.7yrs		

Coronal Cobb angle

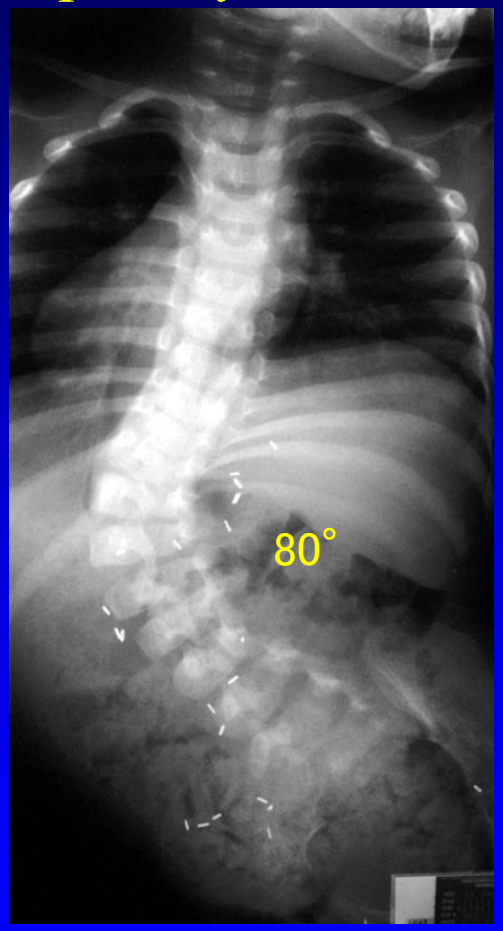


T5-12 kyphosis.

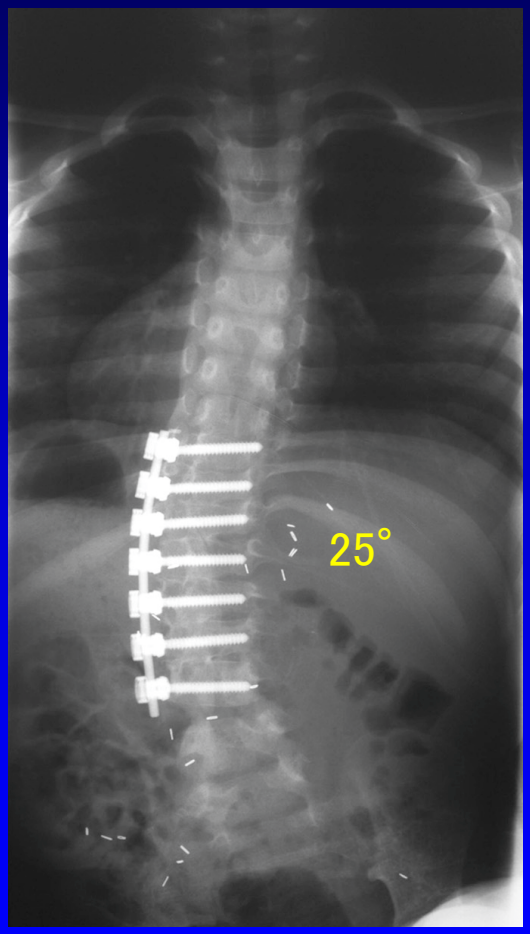


Case 1

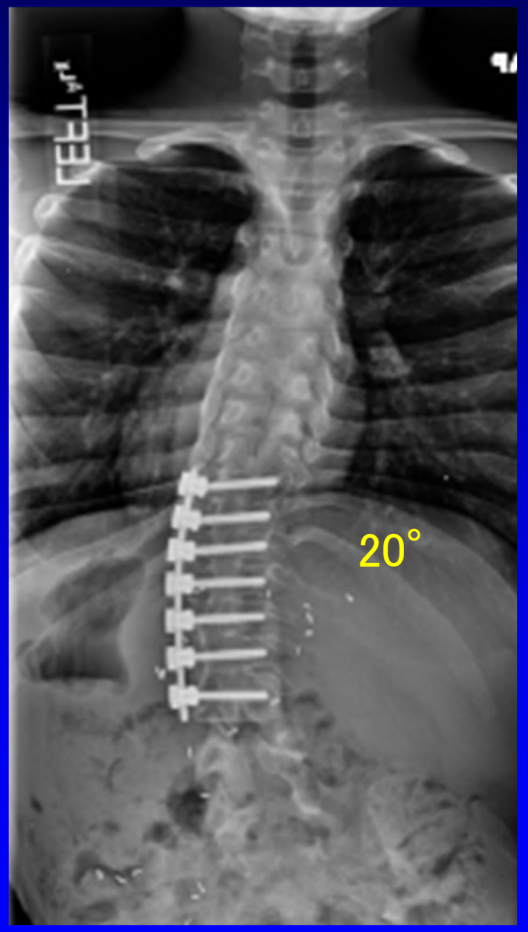
Two year old male who underwent an ASF from T9 to L3 who is 9yrs post-op and yet to need a definitive PSF.



Preoperative x-ray



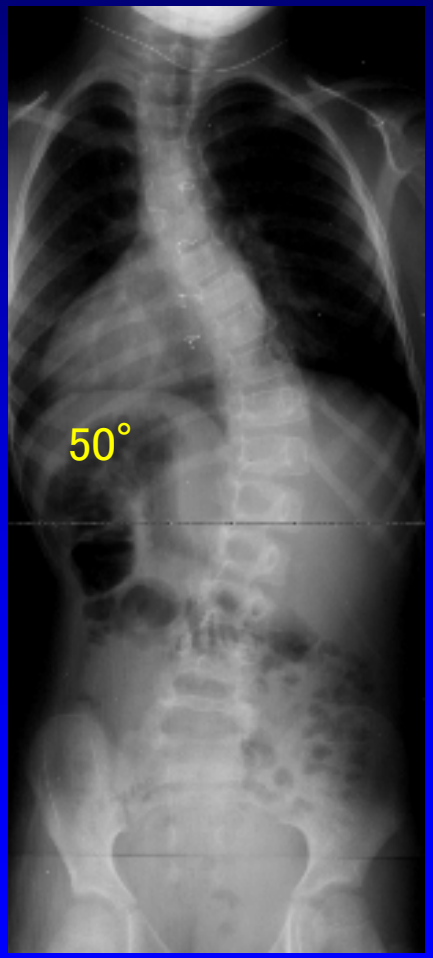
postoperative 2yrs



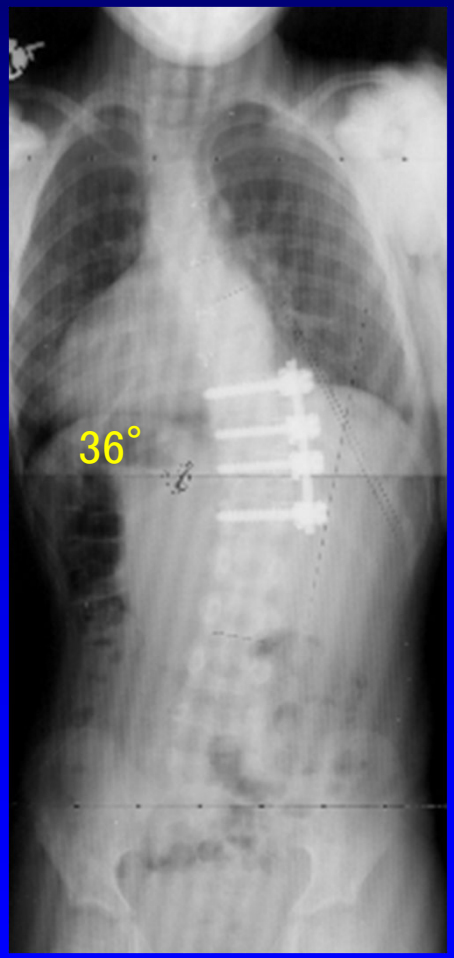
postoperative 9yrs

Case 2

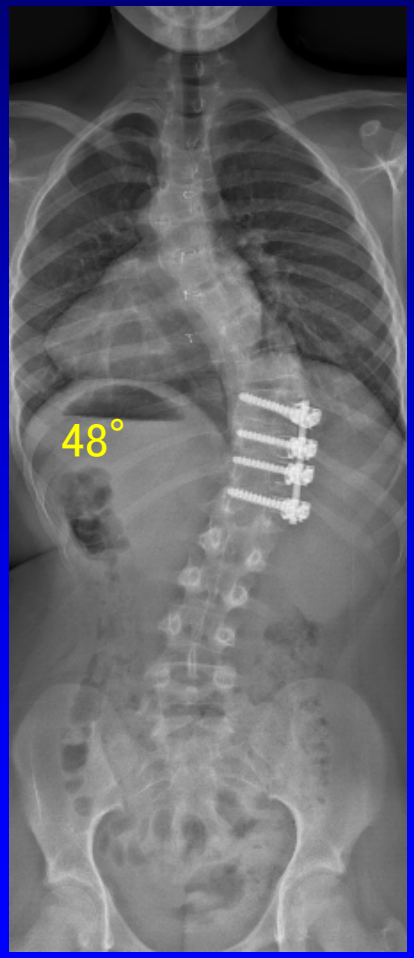
Six year old patient with neuromuscular scoliosis who was fused anteriorly and underwent a PSF 5yrs post-ASF.



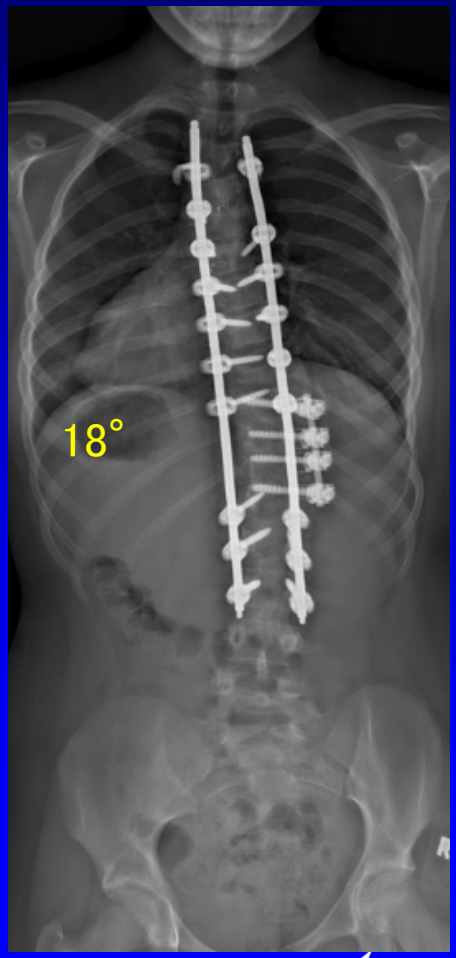
Preoperative x-ray



postoperative ASF



postoperative 5yrs



postoperative PSF

Conclusion

- For select EOS patients (NM), a short ASF may be considered as a means of slowing curve progression and postponing a definitive fusion.
- Compared to distraction based techniques this approach has the potential to avoid the complications with repeated lengthening
  - 9 patients → 75 lengthening avoided
- Be aware of sagittal profile