

Myth vs. Truth: VEPTRs Can Only Be Used for Chest Wall Problems

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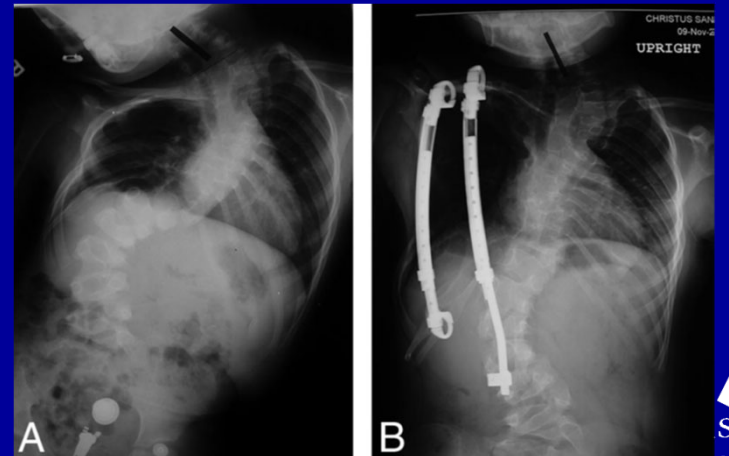


VEPTR - Indications

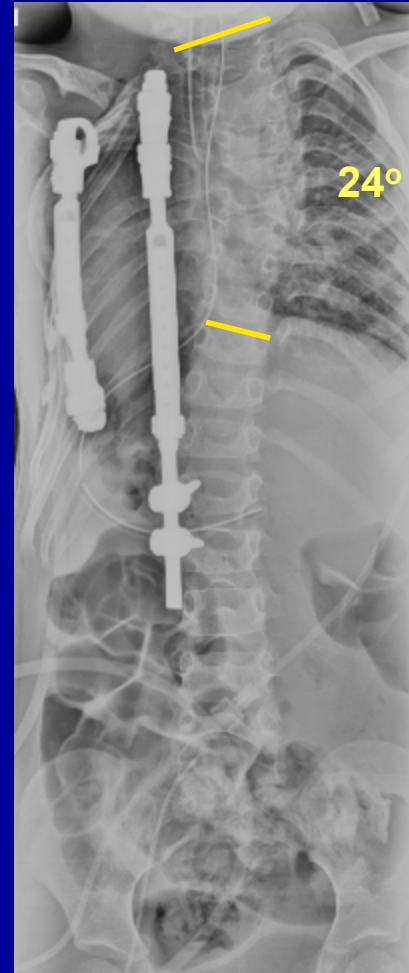
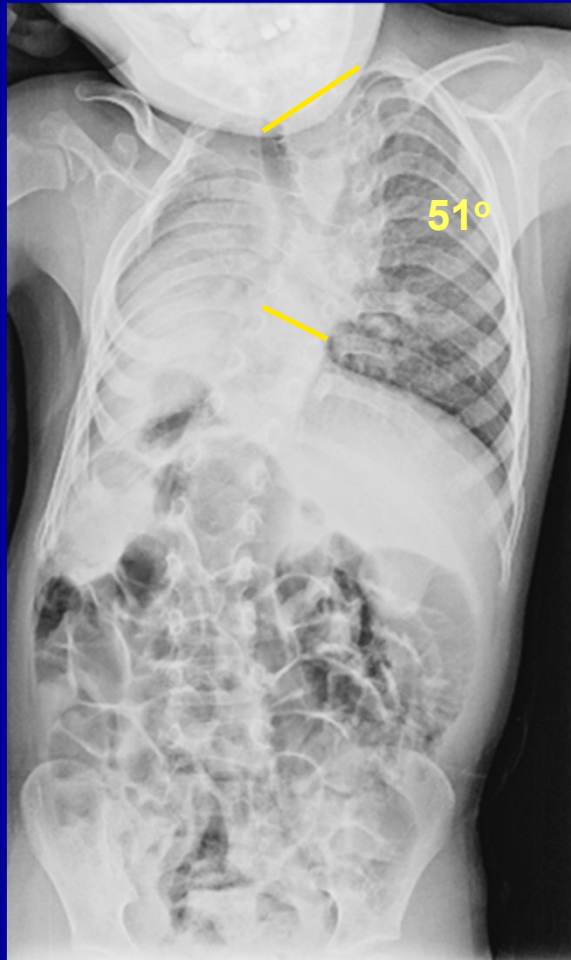
- Thoracic Insufficiency syndrome (TIS)
 - Hypoplastic chest wall syndrome (Jeune's syndrome)
 - Congenital **scoliosis** with fused ribs
- Expansion thoracostomy → improve lung volume → possibly lung function

Chest wall and Spinal Deformity

- VEPTR improves spinal deformity
 - Campbell and Hell, *JBJS* 2003
 - Campbell et al., *JBJS* 2004
 - Cobb correction 74° to 56°
 - Campbell et al., *Spine* 2007
 - Improved cervical tilt
 - Cobb correction 78° to 54°

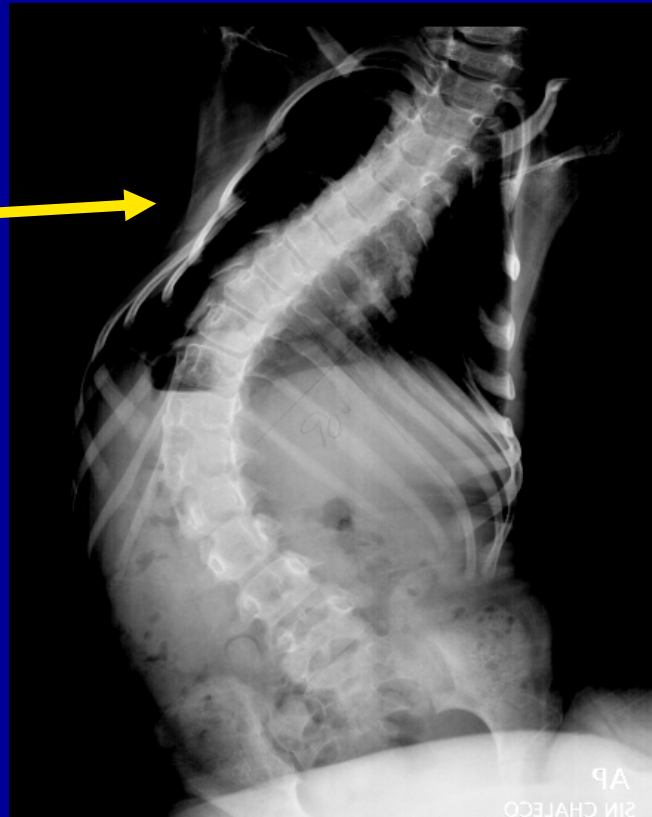


Improved Spinal deformity/cervical tilt



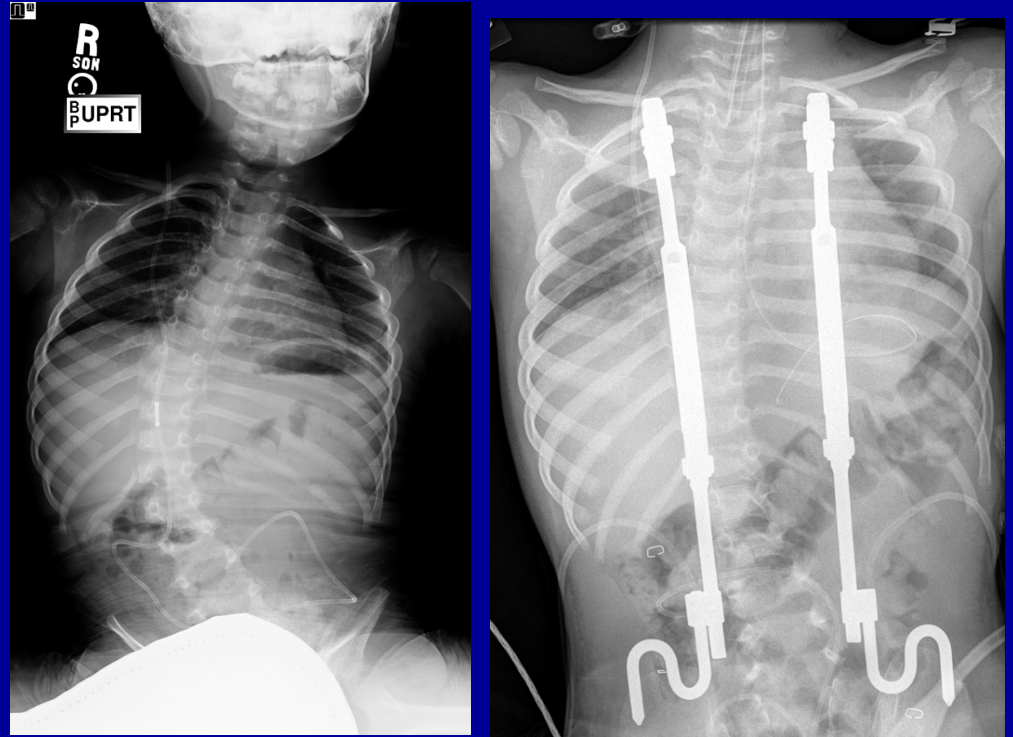
- Can the VEPTR be used only for spinal deformity?

Secondary chest wall deformity



Spinal Deformity

- Internal brace
- Options
 - Rib to spine
 - Rib to pelvis
- Minimizes exposure spine → autofusion



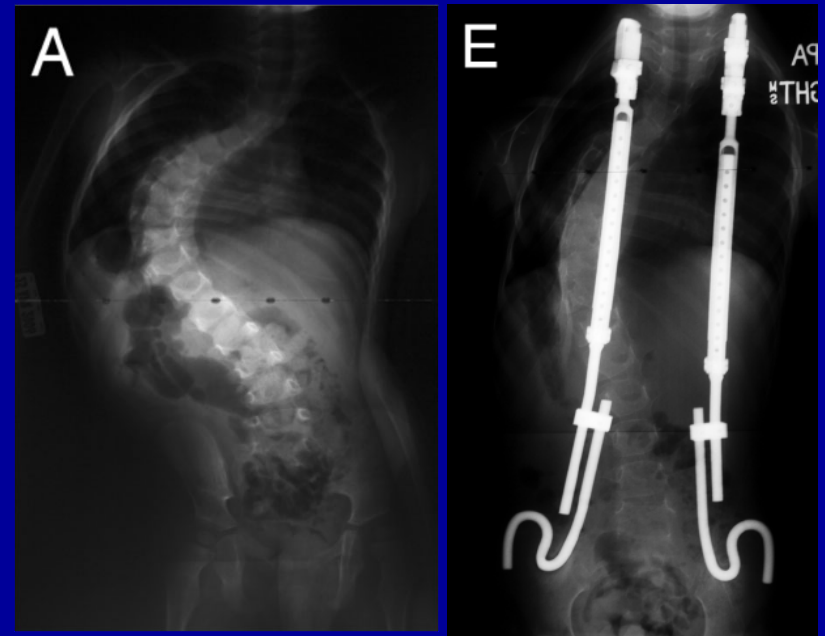
Courtesy of Jack Flynn, MD

Table 1. Growing Rod Versus VEPTR: Positives, Negatives, Advantages, and Drawbacks

	Growing Rod	VEPTR
Positives		
Growth of spine and thorax	Yes	Yes
Spinal deformity correction		
Coronal plane	Yes	Yes, best for single curve
Sagittal plane	Yes, good for both restoration and maintenance	Poor control of upper thoracic kyphosis
	Good control of thoracolumbar kyphosis	
	Maintenance of lumbar lordosis difficult	
Transverse plane	Crankshaft partially controlled	Crankshaft partially controlled
Trunk balance	Yes	Yes
Completeness of instrumentation		
Cervical extension	Yes	No
Lumbopelvic fixation	Yes	Yes
Correction of chest cage asymmetry (equalization of SAL)	Indirectly, if ribs are not fused	Yes
EOS diagnoses treated		
Congenital scoliosis	Yes	Yes
Thoracogenic scoliosis or rib fusions	No	Yes
Bone dysplasias	Yes	Yes
Spinal stenosis	Perhaps	Yes
Spinal bifida	Some	Yes
Spinal infection	Perhaps	Yes
Negatives		
Paralysis with insertion	Yes	Yes
Thoracic outlet syndrome with insertion	No	Yes
Repetitive procedures	Yes	Yes
Anchor point loosening and implant failure	Yes, Lamina breakage, screw pull-out, implant breakage	Yes, rib breakage, hook dislodgement, rib drift. No implant breakage
Risk for skin problems and infection	Yes	Yes
Spine fusion	Limited	No
Thorax stiffness	No	Yes
Spontaneous spine fusion facet arthrosis	Yes	No

Spinal Deformity

- Samdani et al. – *J Neurosurg Spine* 2009
 - Dx: Neuromuscular, Infantile, Congenital, Beals and Arthrogryposis
 - Cobb correction
 - Thoracic - 81° to 58°
 - Lumbar - 35° to 24°
 - Patient growth
 - T1-S1 23 cm to 29 cm



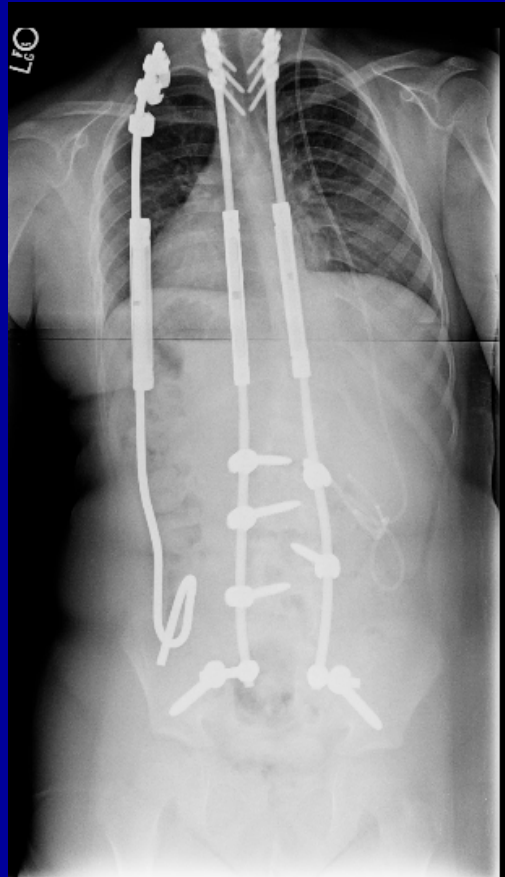
Spinal Deformity

- Fusionless distraction of Spine
 - VEPTR – ribs to spine/pelvis
 - Growing rods – spine to spine/pelvis
- Salvage procedures

6 year old with an Arnold-Chiari malformation and progressive scoliosis.



Repeated revisions and extensions to control coronal decompensation



1 year with rib/pelvis instrumentation to serve as internal brace



6 mo post rib/pelvis instrumentation removal

- Myth vs. Truth: VEPTRs Can Only Be Used for Chest Wall Problems



- Can VEPTRs be used only for spinal deformity?



Yes



Should it?