

ICEOS 2009



# VEPTR Can be Used in a Fusionless Procedure

**Michael G. Vitale MD MPH**

Associate Chief, Division of Pediatric Orthopaedic Surgery

Chief, Pediatric Spine and Scoliosis Service

Ana Lucia Associate Professor of Orthopaedic Surgery

Morgan Stanley Children's Hospital Of New York

Columbia University Medical Center



Morgan Stanley  
**Children's Hospital of New York-Presbyterian**  
Columbia University Medical Center



Columbia Orthopaedics  
Pediatric Orthopaedic Surgery

# Disclosures

- I am a consultant for Stryker Spine and Biomet Spine
- Royalties from Biomet Spine
- Receive Divisional support from Medtronic, Biomet, AO Spine
- Almost nothing I am discussing is approved for the indications that I am using it



**No Conflicts Related to Presentation**

# *End of Construct Failure*

occurs when construct feels high loads

(PJK, Prox Hardware failure, Rod)

- Affected by patient size and curve –
  - Traction !
- Affected by differing anchor types
  - Sloppy vs rigid
- Affected by lengthening mechanism
  - physiologic vs nonphysiologic

# C.F. – Kyphoscoliosis in 2 yo



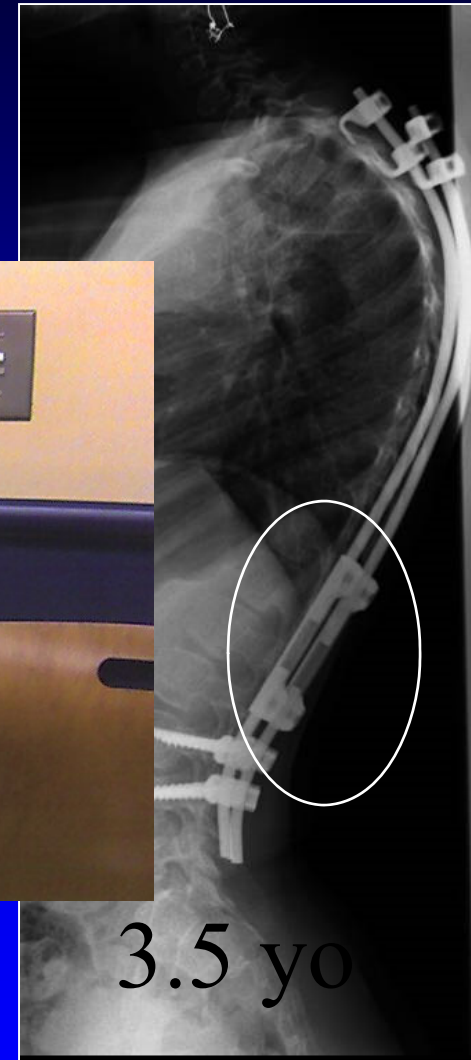
- Traction
- Sloppy Anchors
- Physiological lengthening



# Preop Traction 11.16.09



# Growing Rods for Kyphoscoliosis



Use of Halo

Non physiological lengthening

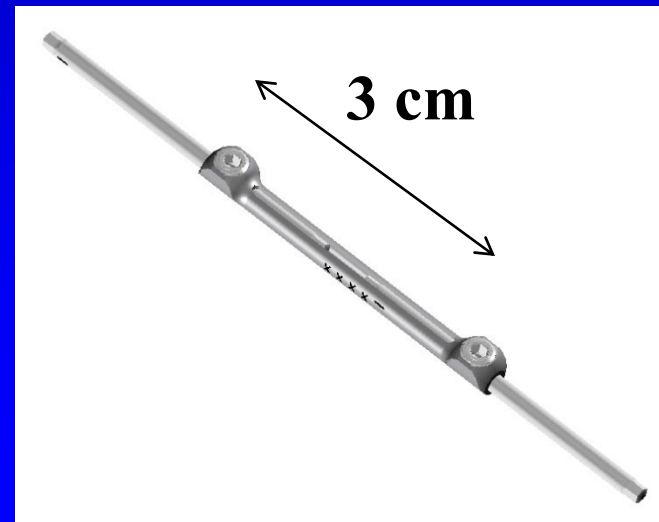
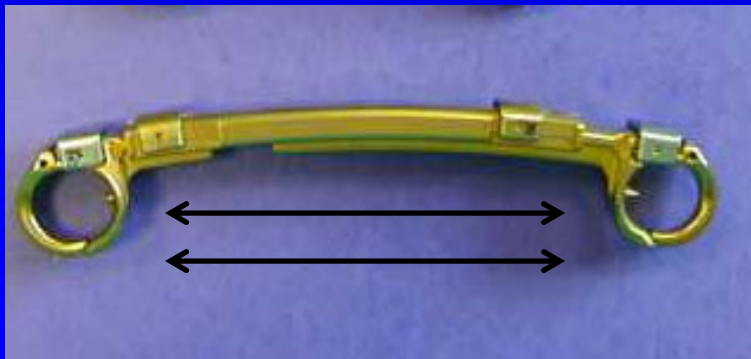


# Distraction: Growth Rods vs VEPTR

## 1x vs 2x lengthening



*physiological  
lengthening*



# VEPTR – control of distraction

**physiological  
lengthening**



500 mm



220 mm



# Expandable Rods: What is ideal Proximal Anchor for Kyphosis?

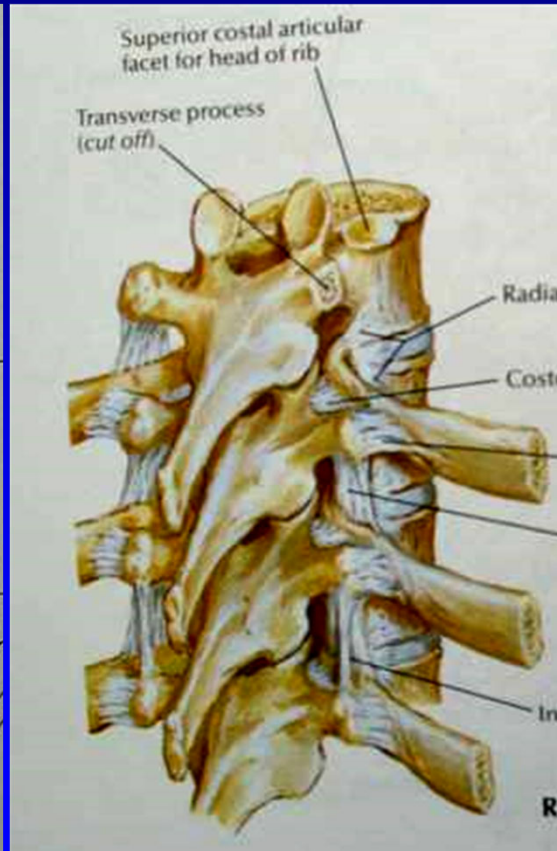
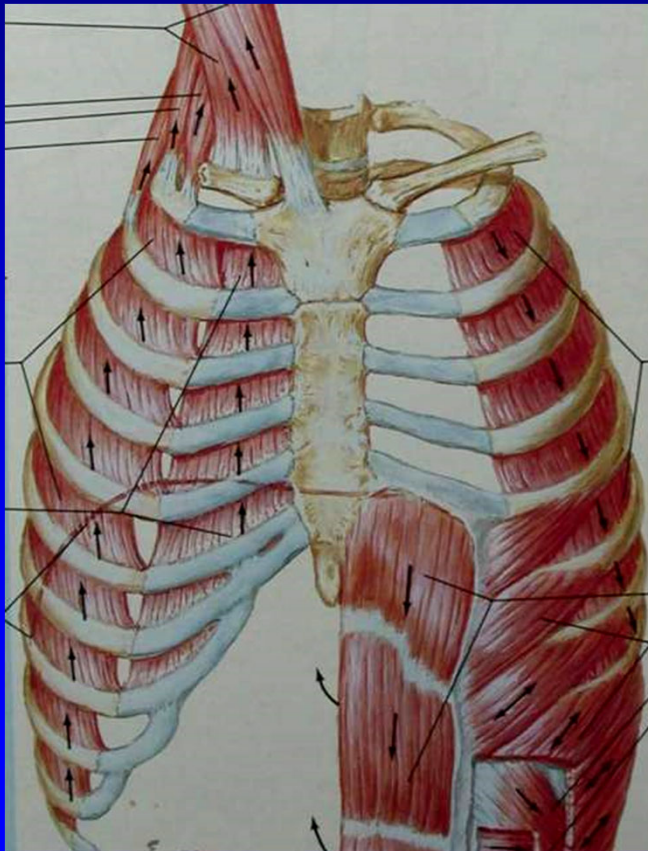
- Proximal Junctional Kyphosis more likely
- Intuitively worse with rigid fixation and more midline dissection

**Anchors**



# Costotransverse joint and nonrigid fixation to rib allows “low modulus construct”

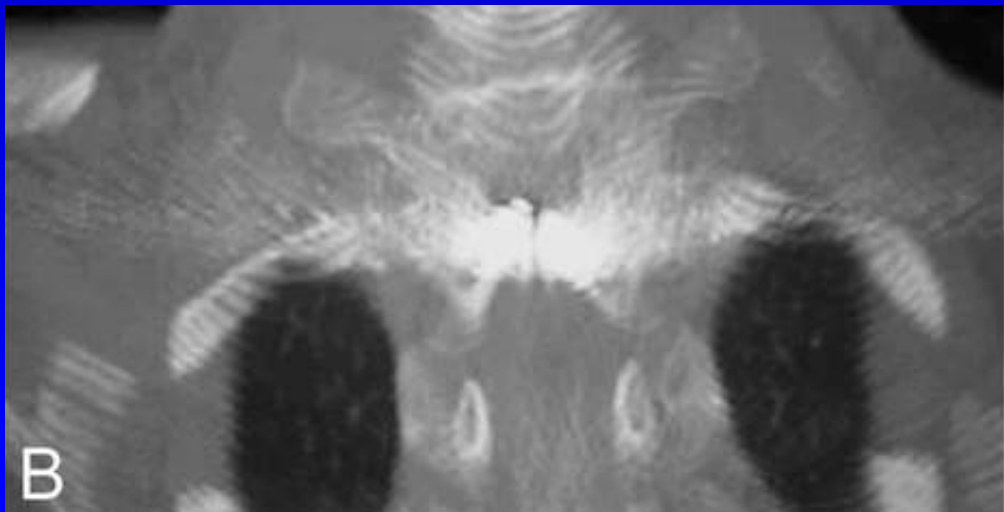
## Anchors



# Pedicle Screws in Young Kyphotic Kids: Lessons Learned



- Case report of screw pullout in growing rod resulting in paralysis

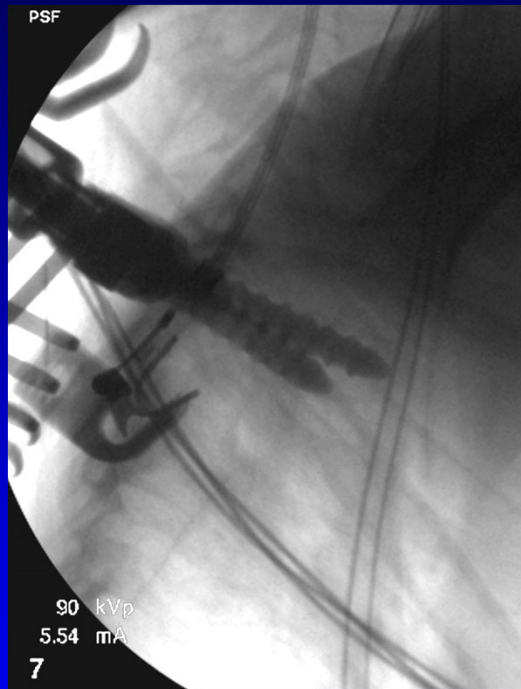


- Foundation should have at least 2 screws at different levels

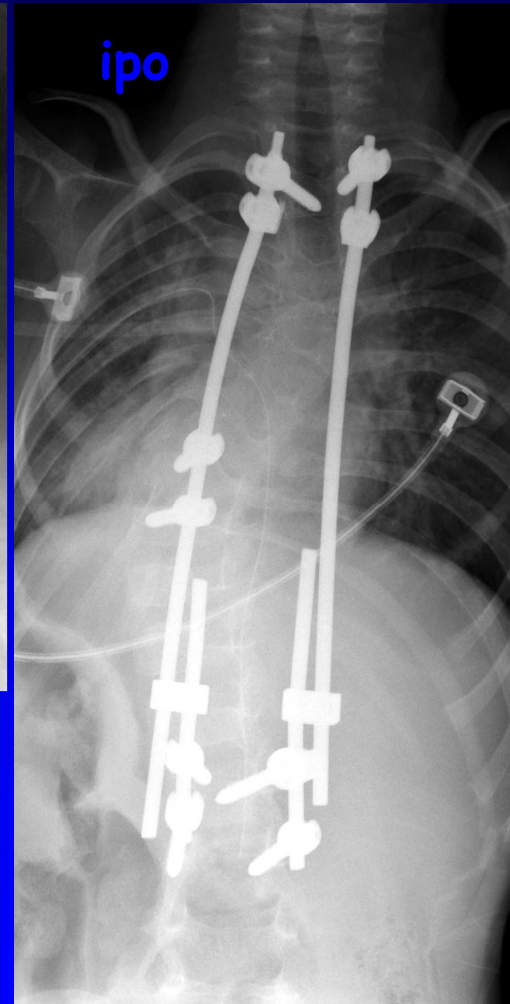
**Anchors**



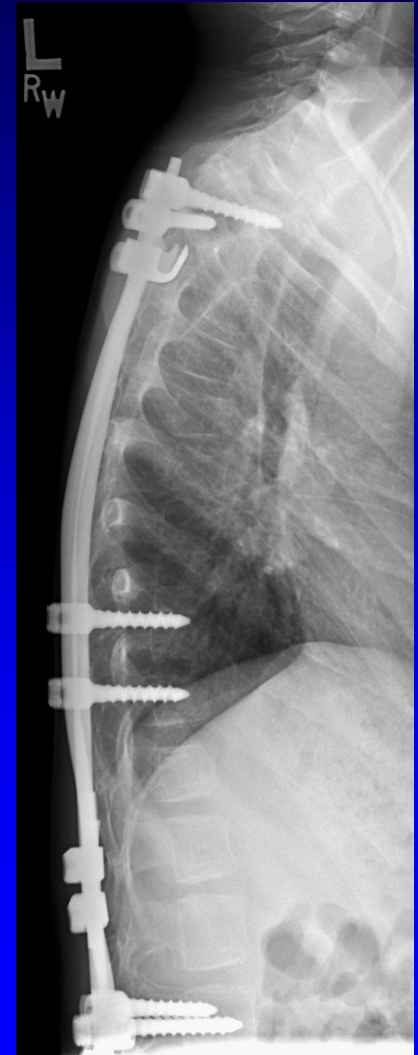
If you think t.p.s. might be better  
upper thoracic anchor.....



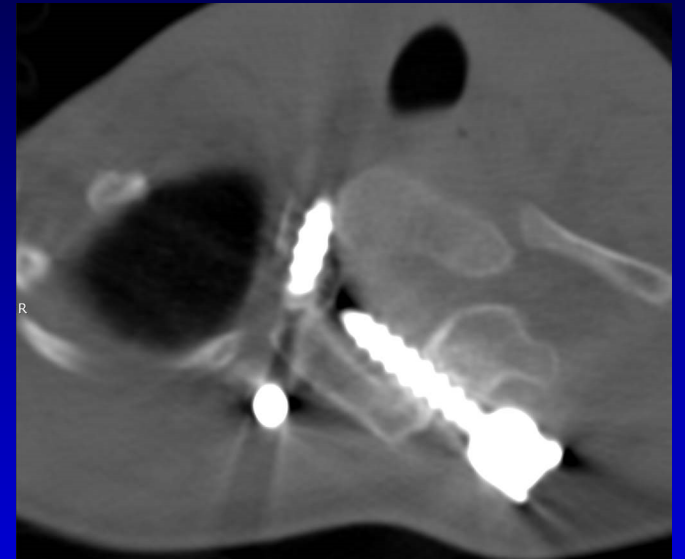
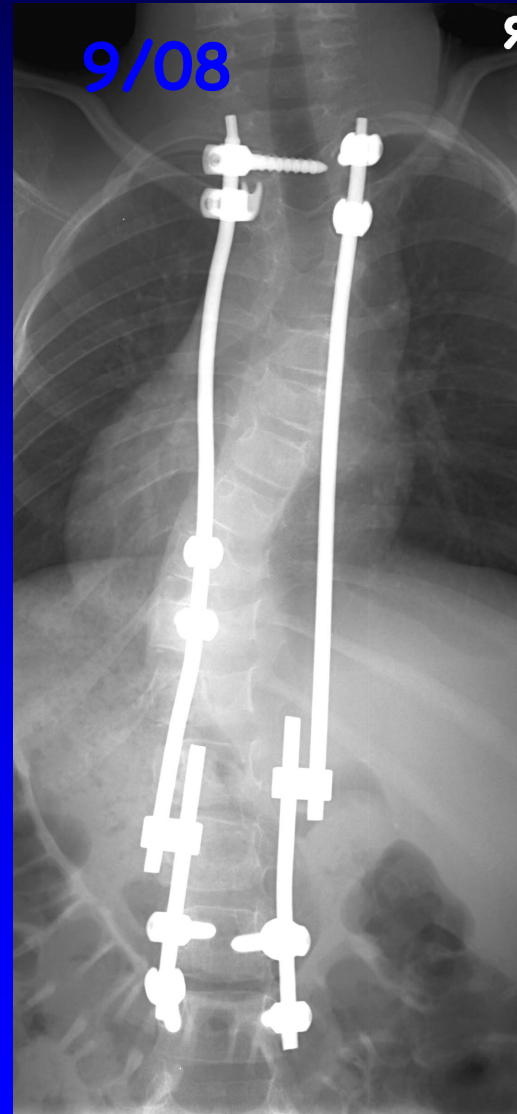
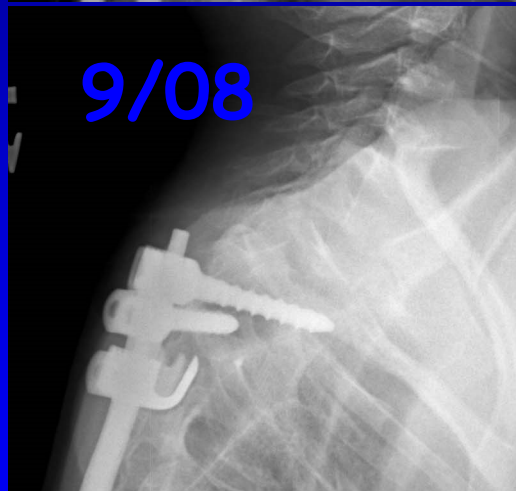
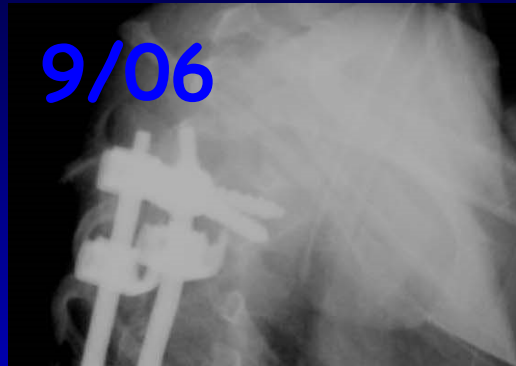
Dos 9/06  
uneventful



2 yr  
later,  
lengthen  
x3  
uneventful



Spastic paraparesis, urinary retention  
5 mo after last uneventful lengthening

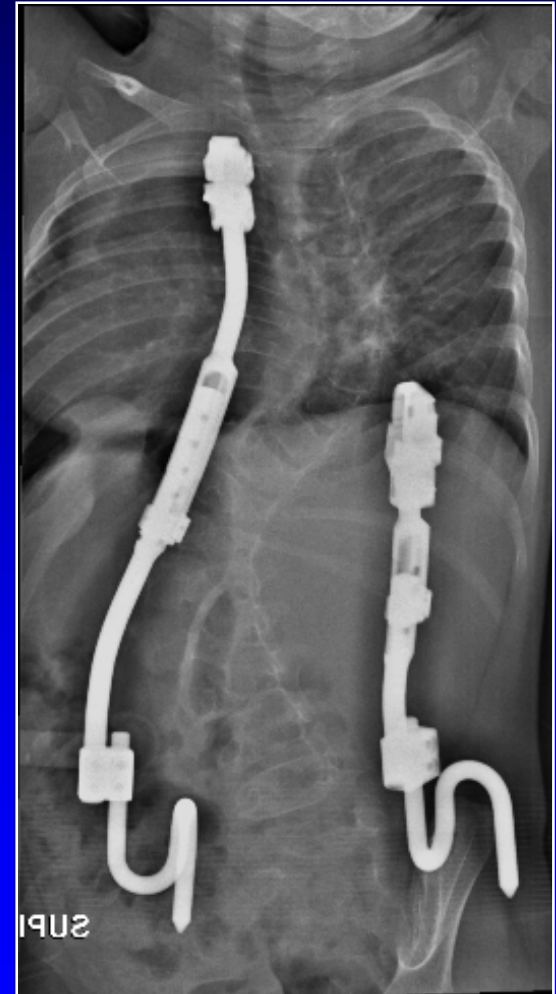


**Anchors**

# Rib Foundations in the Young Child

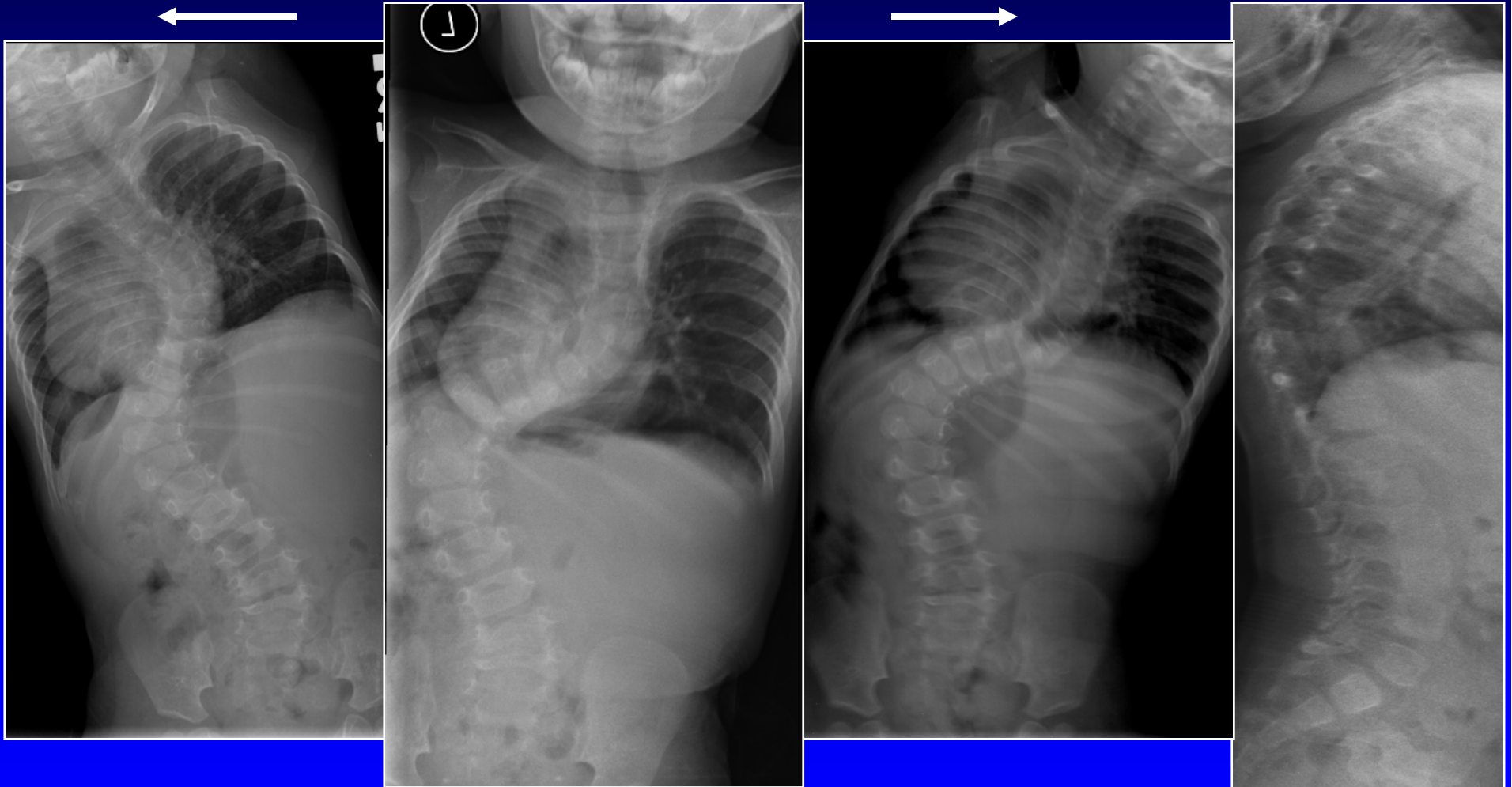
- Use rib foundations *when possible* to stall in child <5 yo
- Safe, “sloppy” and effective
- Avoid midline

**Anchors**



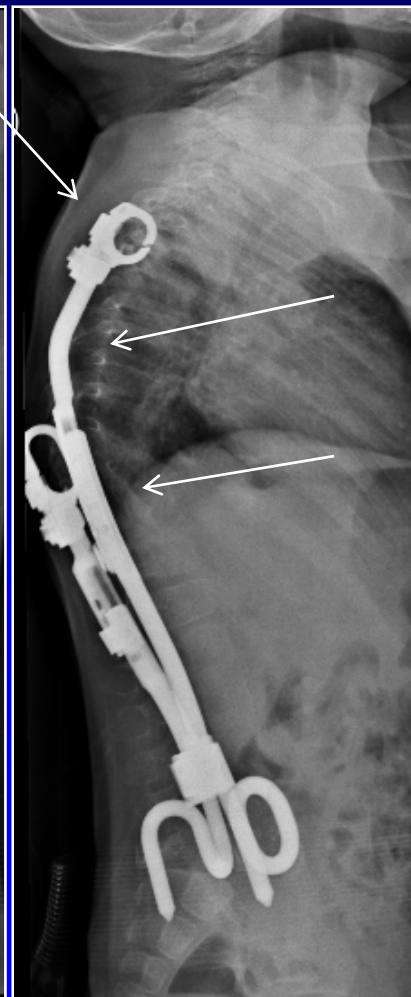
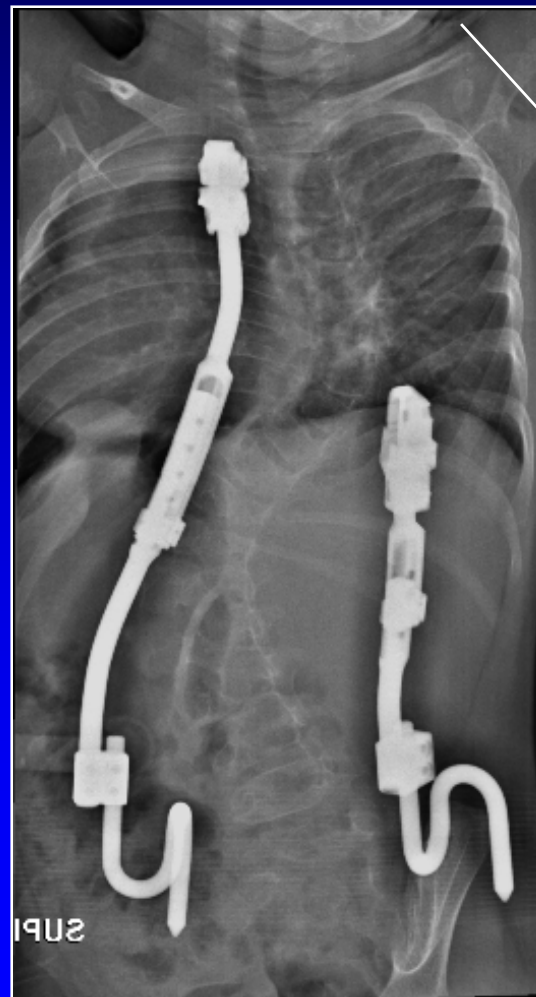
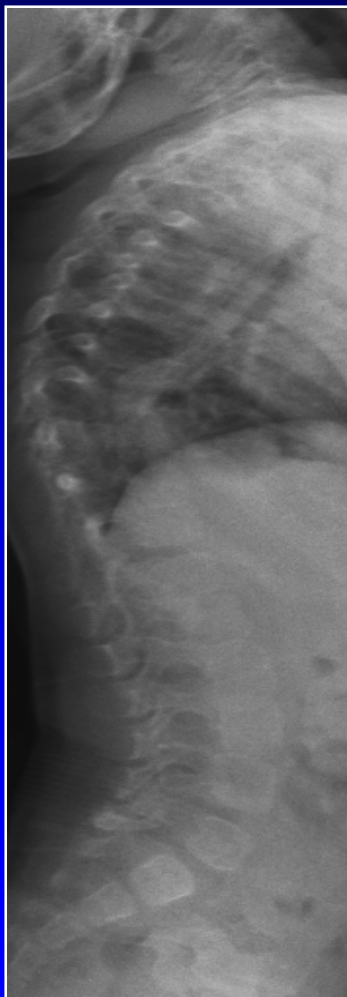


14 mo with kyphoscoliosis and CDH;  
failed bracing



1/8/2009

# E.W - 10 mo post op



# DATA SPEAKS !

## THE EFFECT OF VEPTR IMPLANTATION ON SAGITTAL PLANE ALIGNMENT

PETER F. STURM M.D., SAHAR HASSANI  
M.S., KRISTEN ZAHARSKI B.A., MARY  
RIORDAN B.A. AND THE CHEST WALL  
STUDY GROUP



# VEPTR in Hyperkyphosis

- 91 patients with fu > 2 years
- 19 patients with kyphosis >50 deg
- 72 patients < 50 degrees
- Mean age at Index Surgery 5yrs 4 mo
- Mean FU 42 mo

# Results of VEPTR on Sagittal Plane

- VEPTR in normokypnosis  $< 50$  deg
  - Preop 39
  - Post Op 39
  - Final 50 (lengthening is kyphogenic but ok)
- VEPTR in Kyphosis  $> 50$  deg
  - Preop 70
  - Post Op 59 (cantilever reduction)
  - Final 75 (lengthening is kyphogenic but ok)

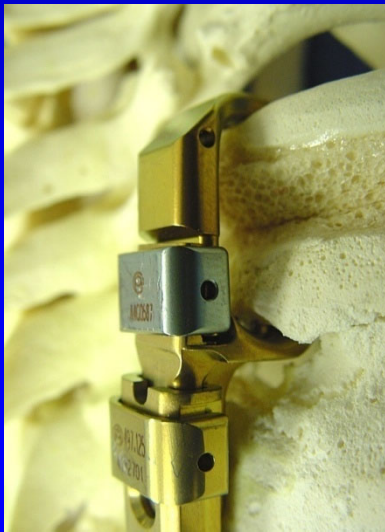
# Growth Strategies for Kyphosis: Lessons Learned

- Preop traction - stiff kyphotic curves  $> 60$ 
  - instrumentation holds better than corrects
- Sloppy (Low modulus) anchors
- Save bone for later
  - Avoid PS in young
  - Span deformity with long constructs



# Conclusion: VEPTR is good option for hyperkyphosis

- Anchors are more forgiving
- Lengthening options more versatile
- Larger Device less likely to fx



# Thank You



[mgv1@columbia.edu](mailto:mgv1@columbia.edu)



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