

Tips and Tricks: Intraoperative Spine Traction Using Distractor from Ribs to Greater Trochanter

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Disclosure

- No commercial relationships relevant to disclose for this presentation.

Intra-op Halo Femoral Traction

■ Advantages

- Elongates spine and thoracic cage, improves pulmonary function
 - Hamzaoglu 2008
- Derotates, facilitates exposure, easier screw insertion
 - Jhaveri SN 2009
- Avoids anterior release
 - Keeler KA 2010
- Balances the spine over the pelvis
- Less surgical time
 - Ville R, 2006
- Less stress on the implants during correction

Disadvantages

- Need to place femoral pins
- Encourages lumbar lordosis in patient who is a sitter.
 - Rinella A 2005.
- Must pull through the neck, increased facial pressure, less correction delivered to deformity.
- Distraction moment, 50% MEP changes
 - Lewis SJ 2011

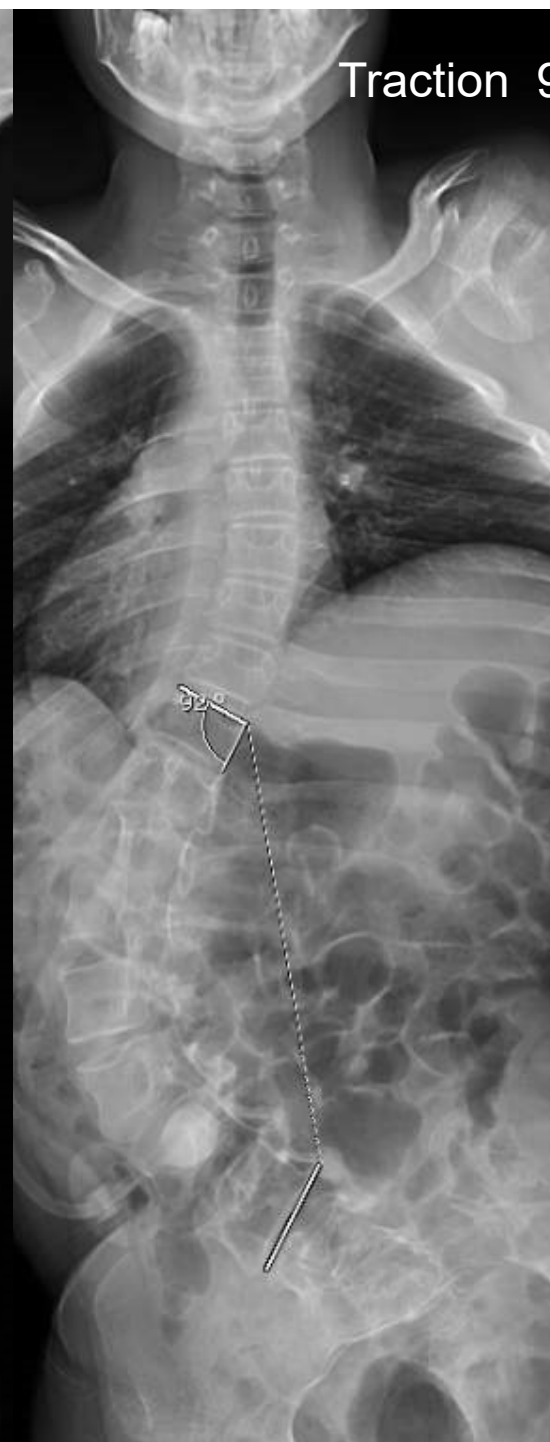
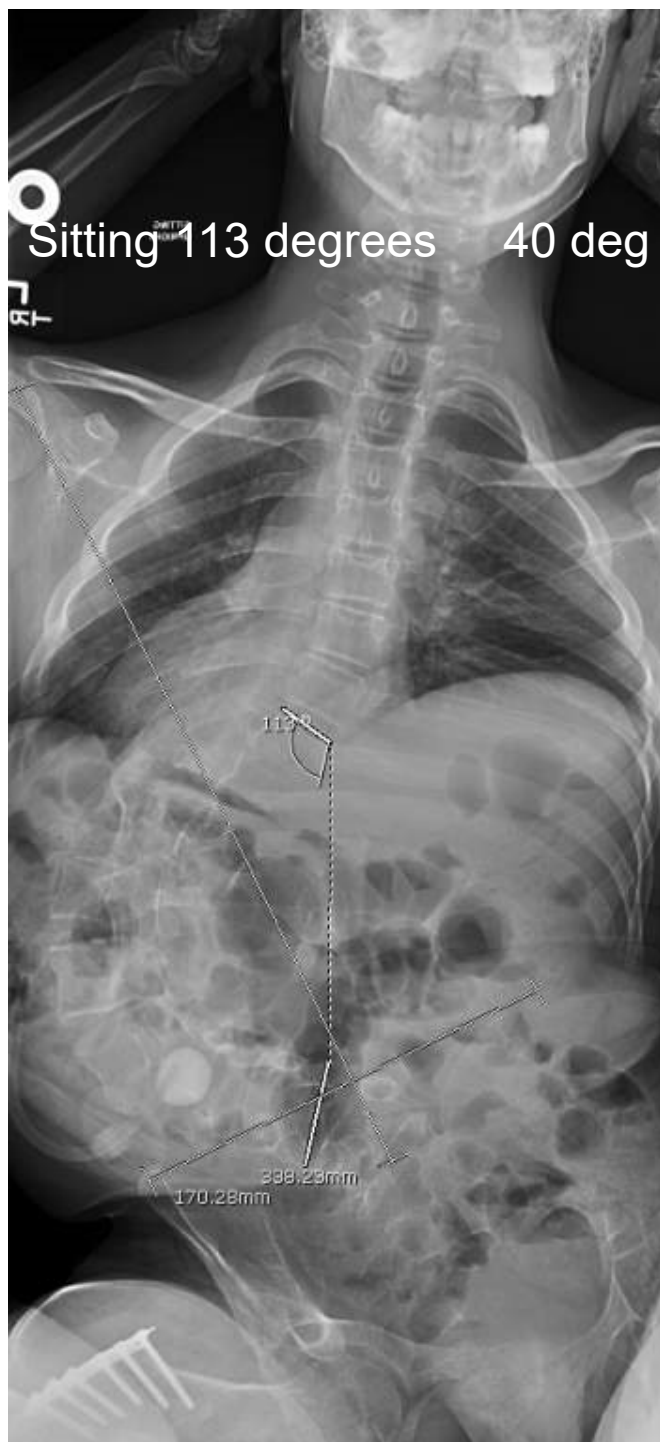
Case 1: NM Scoliosis, Marked Imbalance

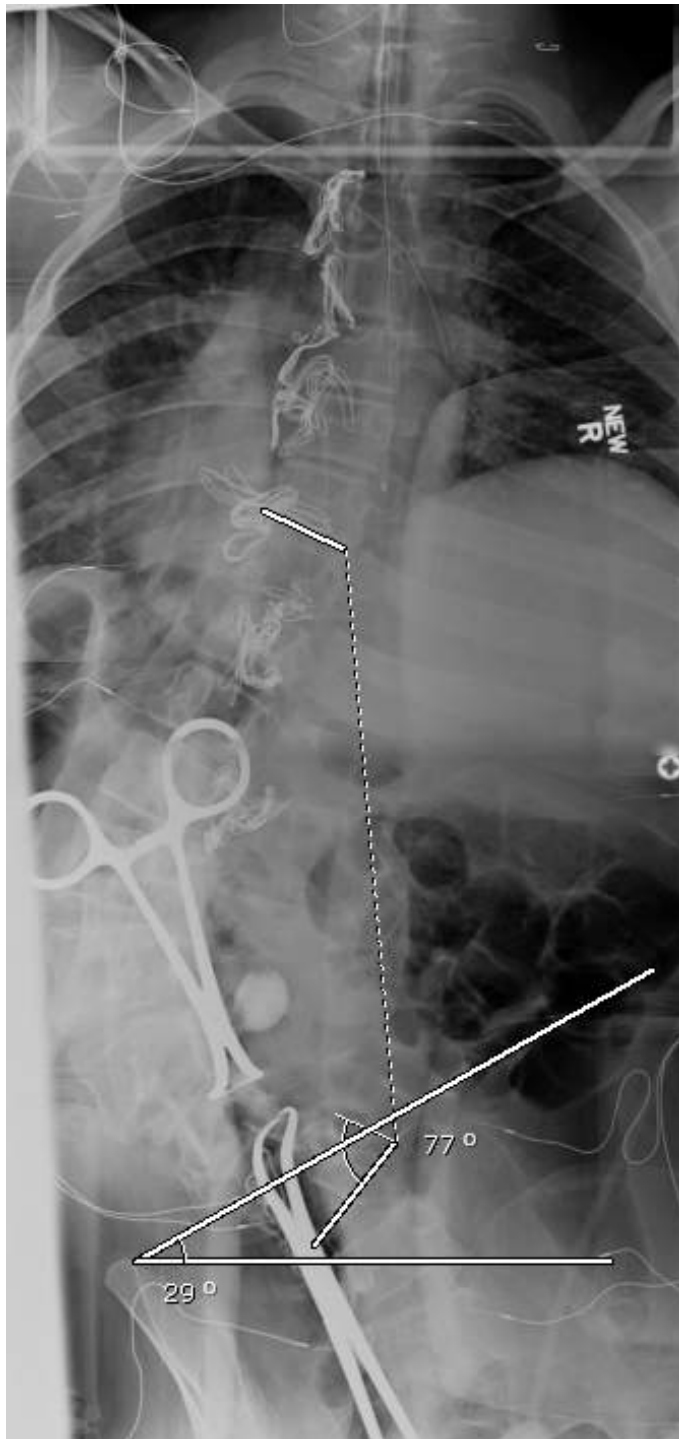
- 14 year male CP GMFCS 5
- DX: 113 degree left thoracolumbar scoliosis
- Marked difficulty sitting and discomfort.
- Seizure disorder on meds
- Osteoporosis with history of fractures
- DXA: Z scores range from -10.6 to -3.7



Advantages of Distractor from Ribs to Greater Trochanter

- Readily available, adapts easily for use.
- Allows hip flexion during surgery for patients who are sitters.
- Placed way out lateral
 - Out of the way during exposure and implants
 - Can be distracted for 1-2 hours while implants placed and IOM monitored
 - Biomechanically delivers bending moment. Safer?
- Can be used in compression or distraction
- Load sharing, less force on the implants





Surgery

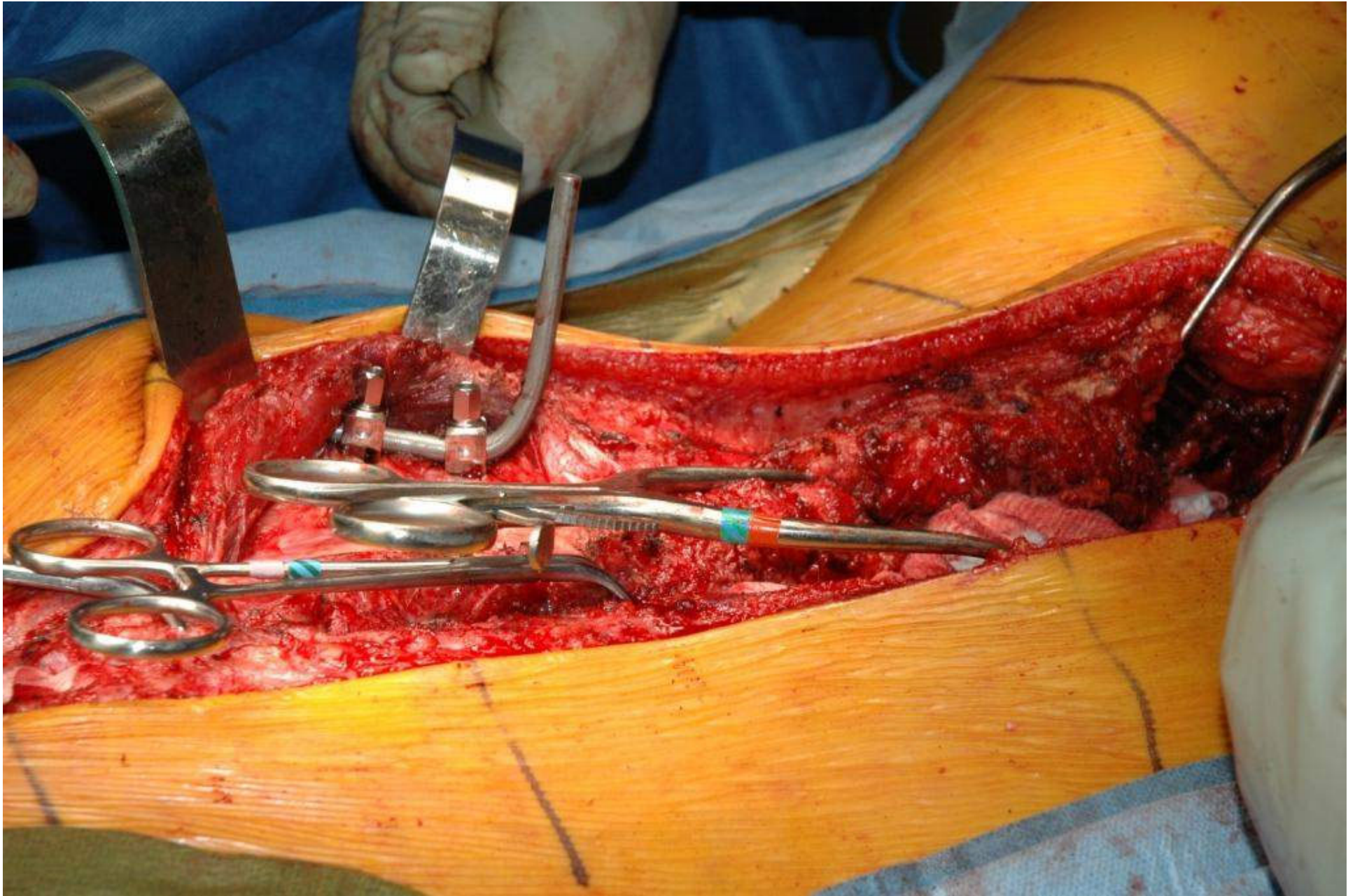
**Prone on the OR table
Cobb 77 deg**

Pelvic obliquity 29 deg





45 deg vectored traction 15#



Place right upgoing hooks on midthoracic ribs



Right schanz pin placed into greater trochanter

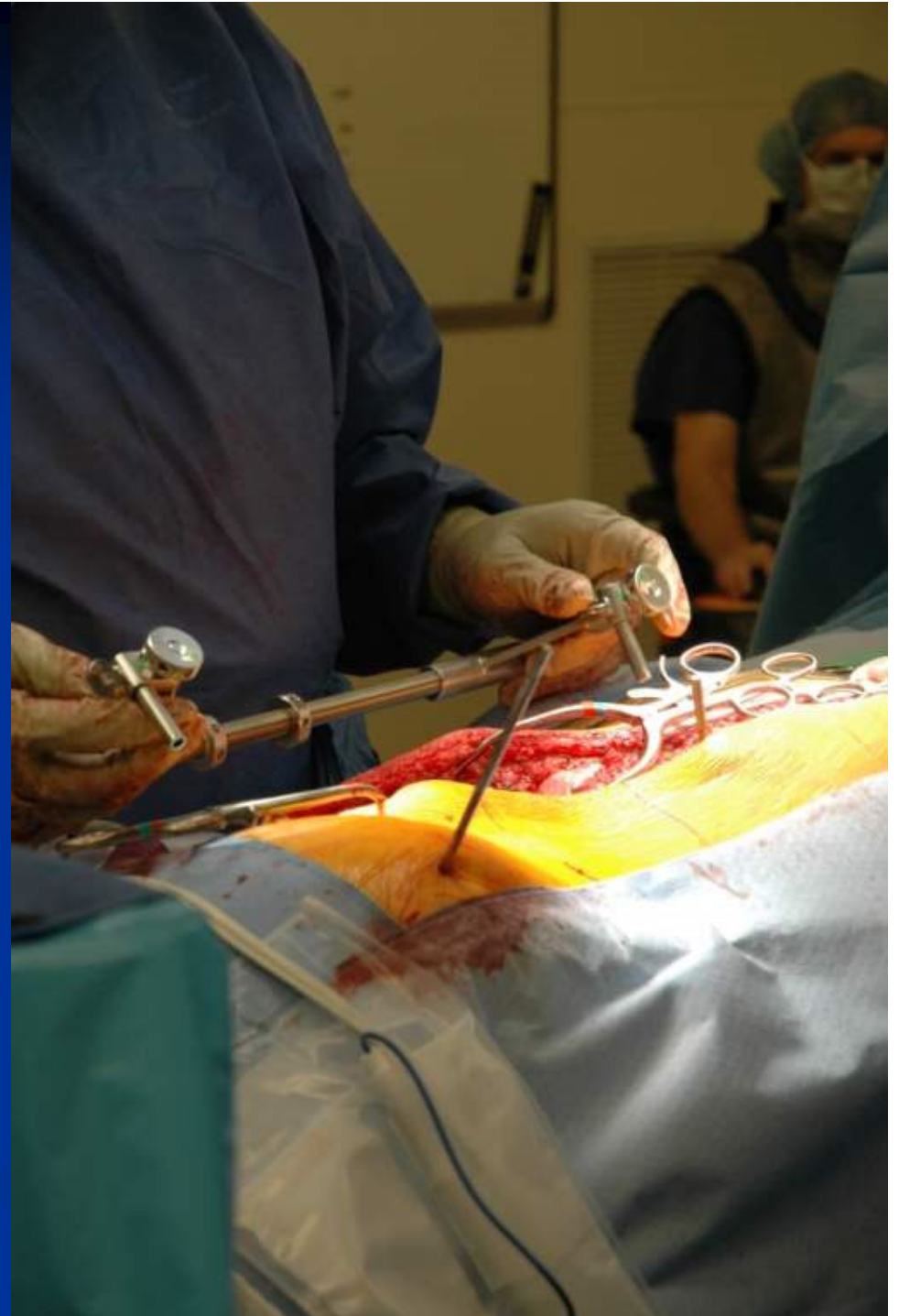


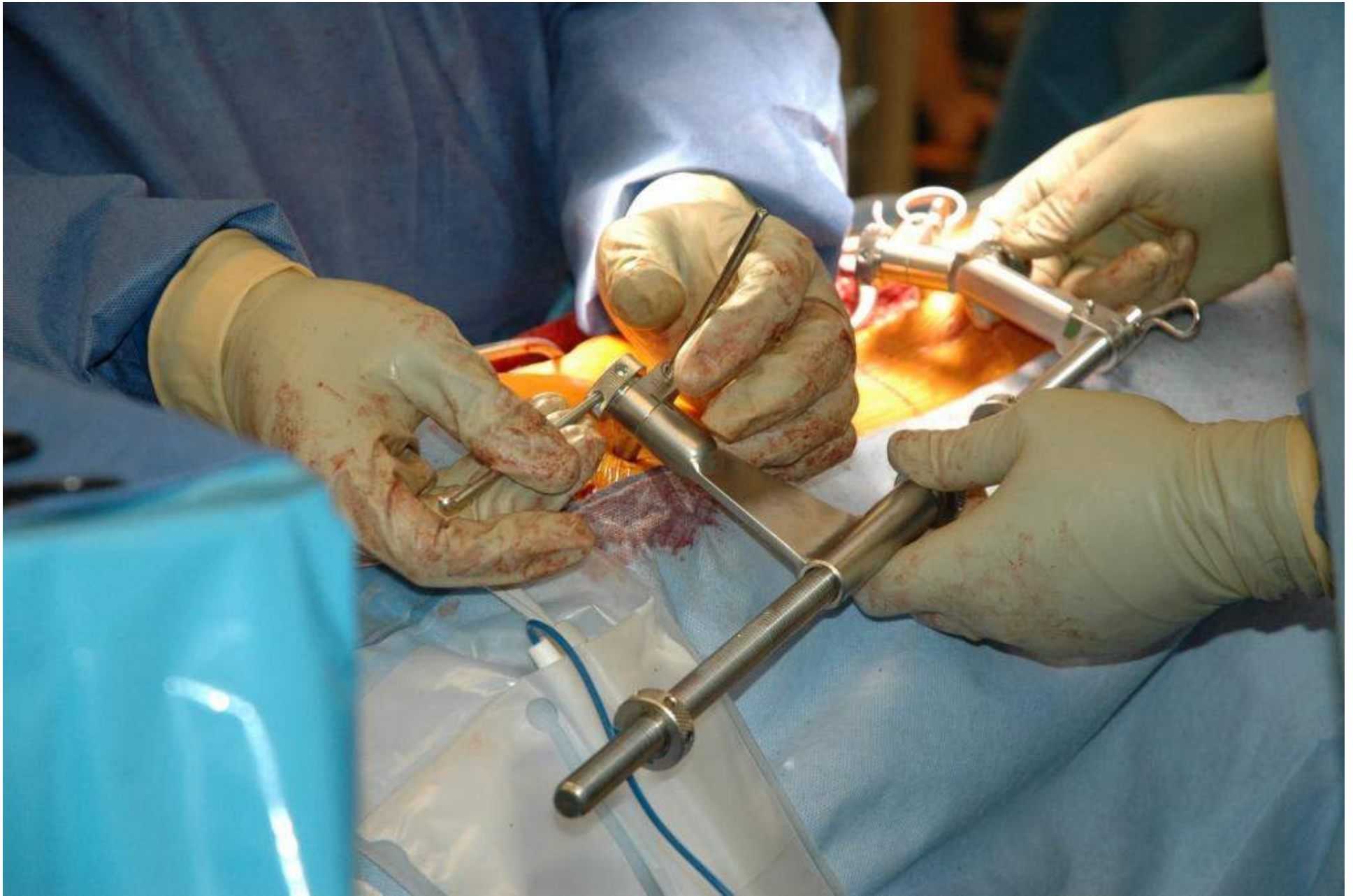
Shanz pin in proximal right femur

Upgoing hooks under ribs 7,8

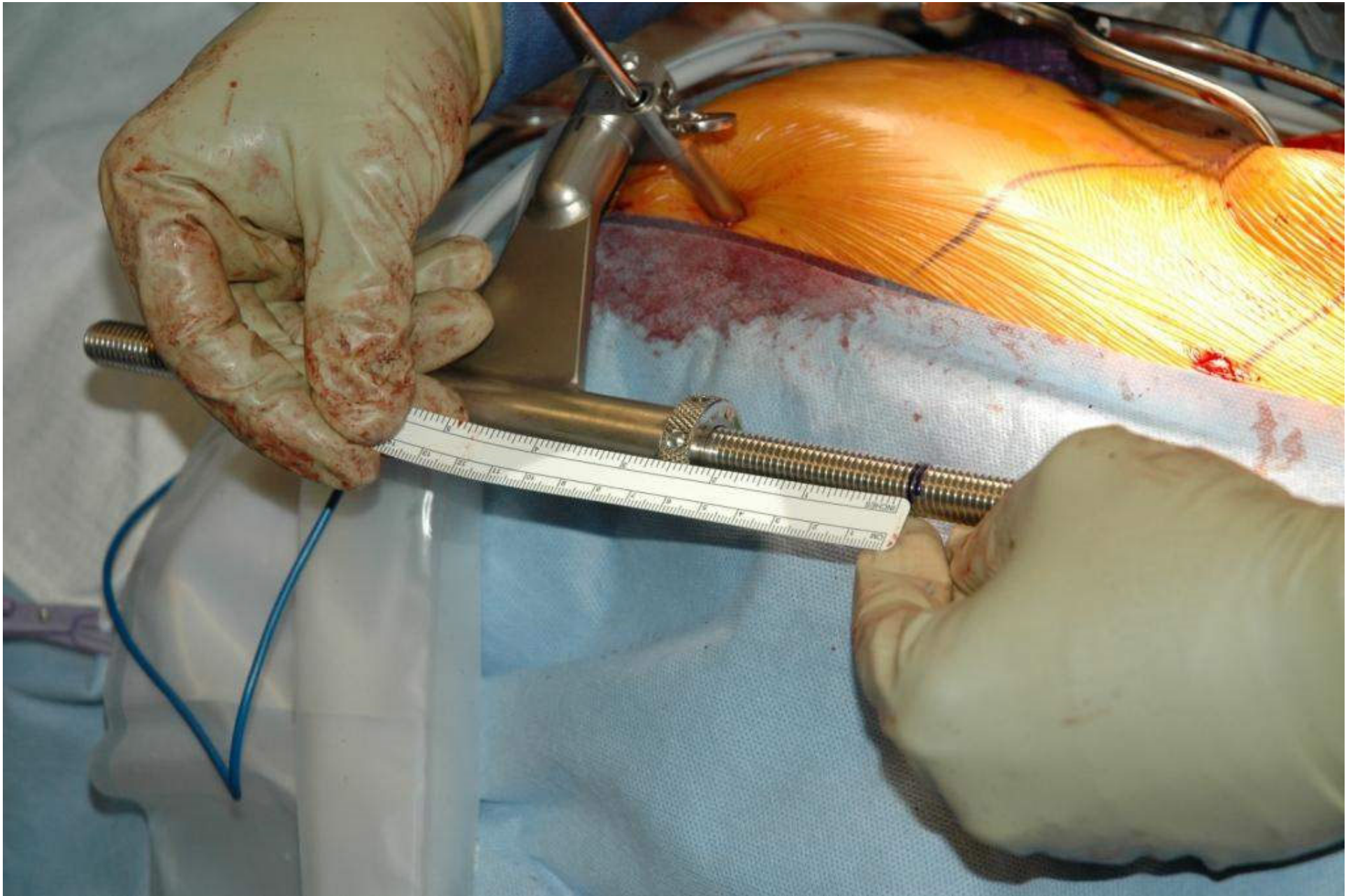


Shanz pin into R greater trochanter





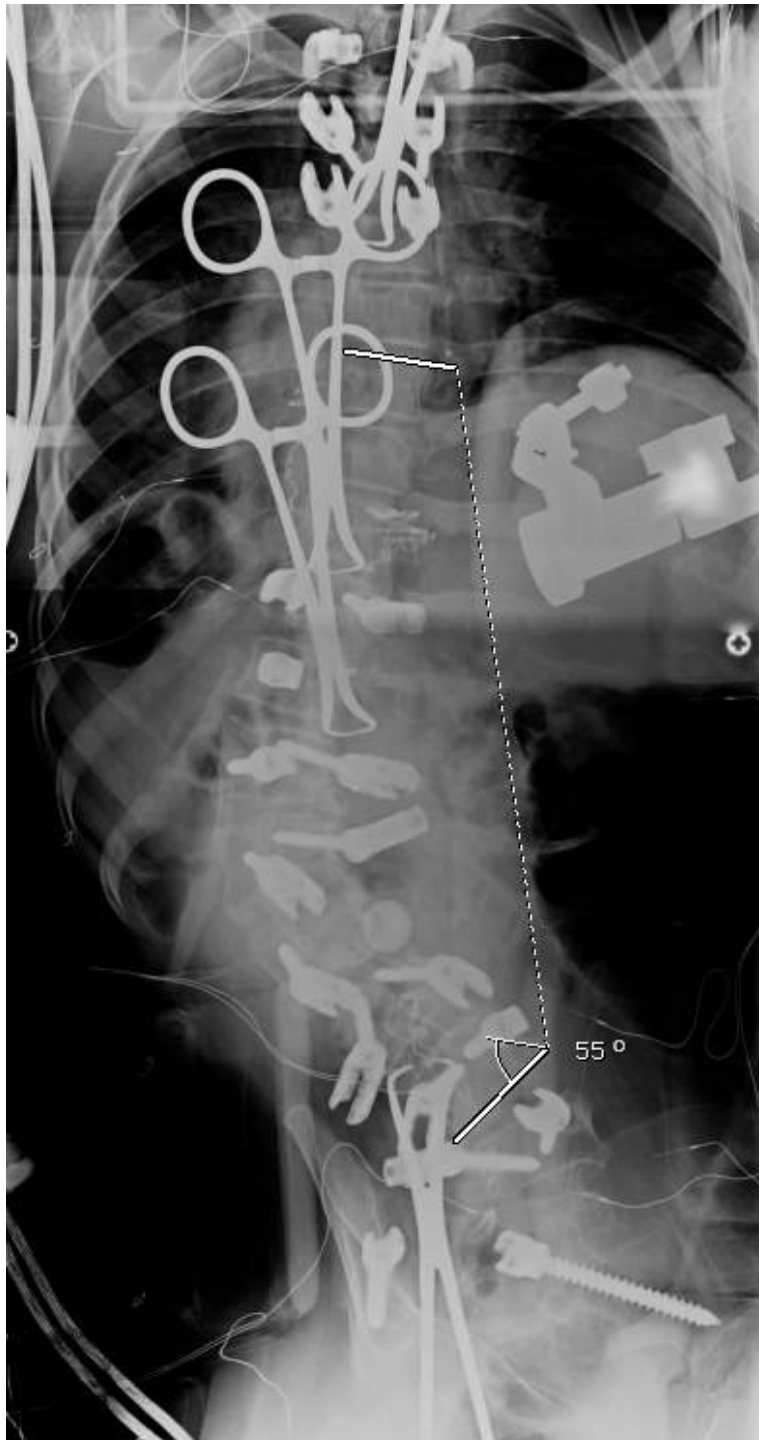
Applying the distractor



6 cm of distraction



Distracted 8 cm

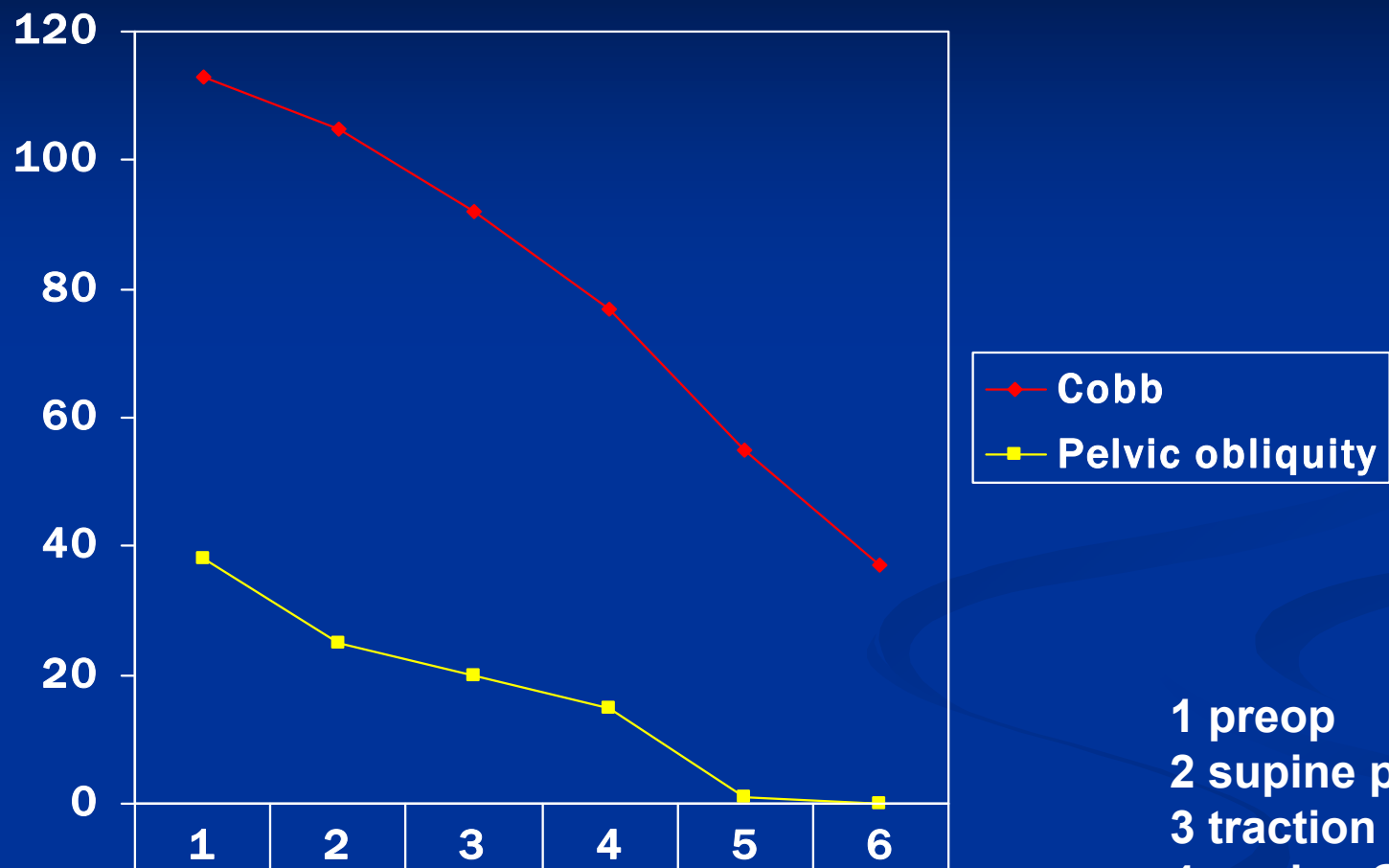


**Femoral distractor
ribs to right greater
trochanter.
lengthened while screws
are being placed and
posterior release.**

**8 cm lengthening
55 degree Cobb
Pelvis more level**



Intraoperative Distractor



◆ Cobb	113	105	92	77	55	37
■ Pelvic obliquity	38	25	20	15	1	0

1 preop
 2 supine preop
 3 traction preop
 4 supine OR
 5 distractor
 6 final OR



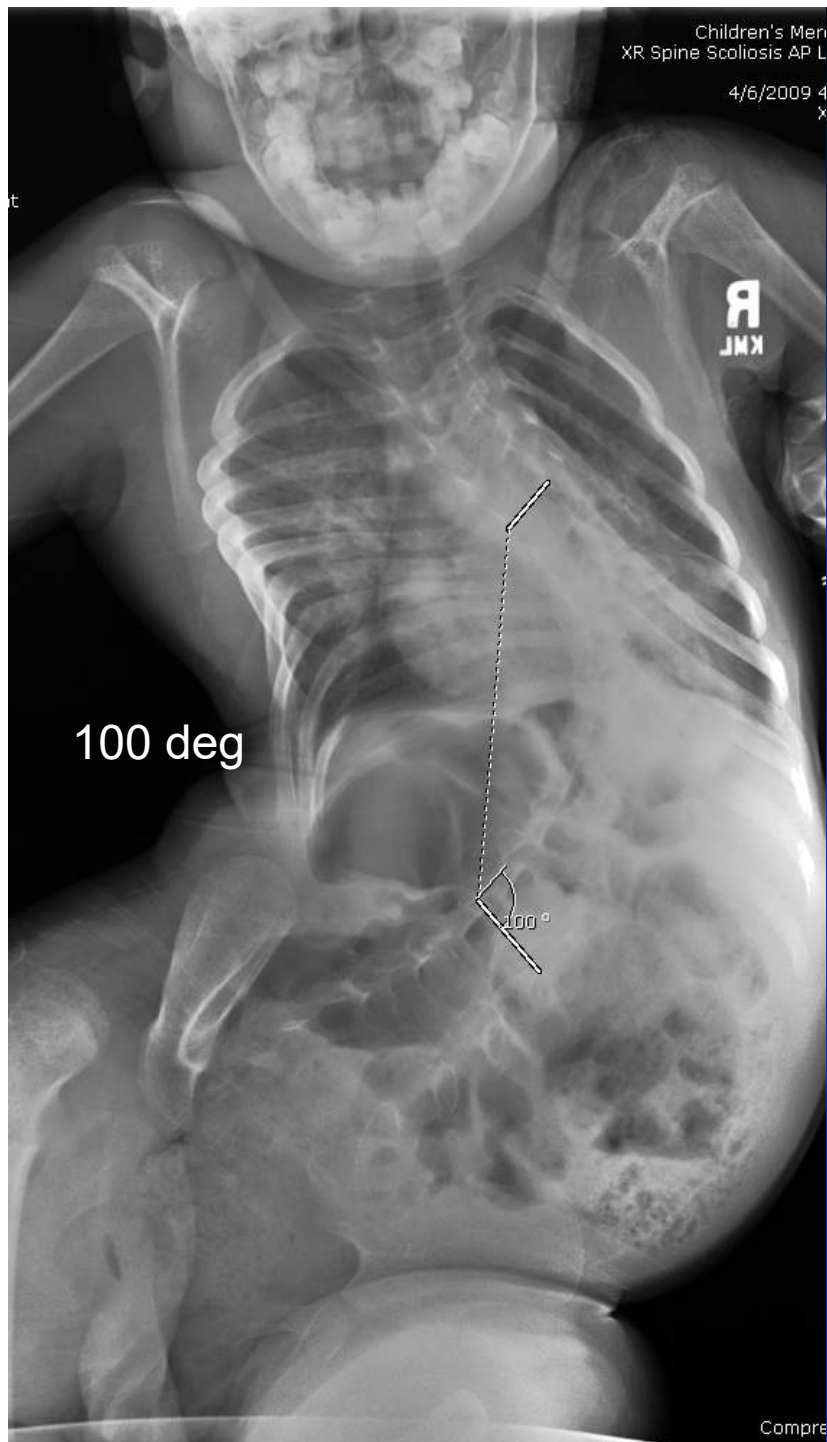
12 mo post op



Case 2 : EOS Neuromuscular

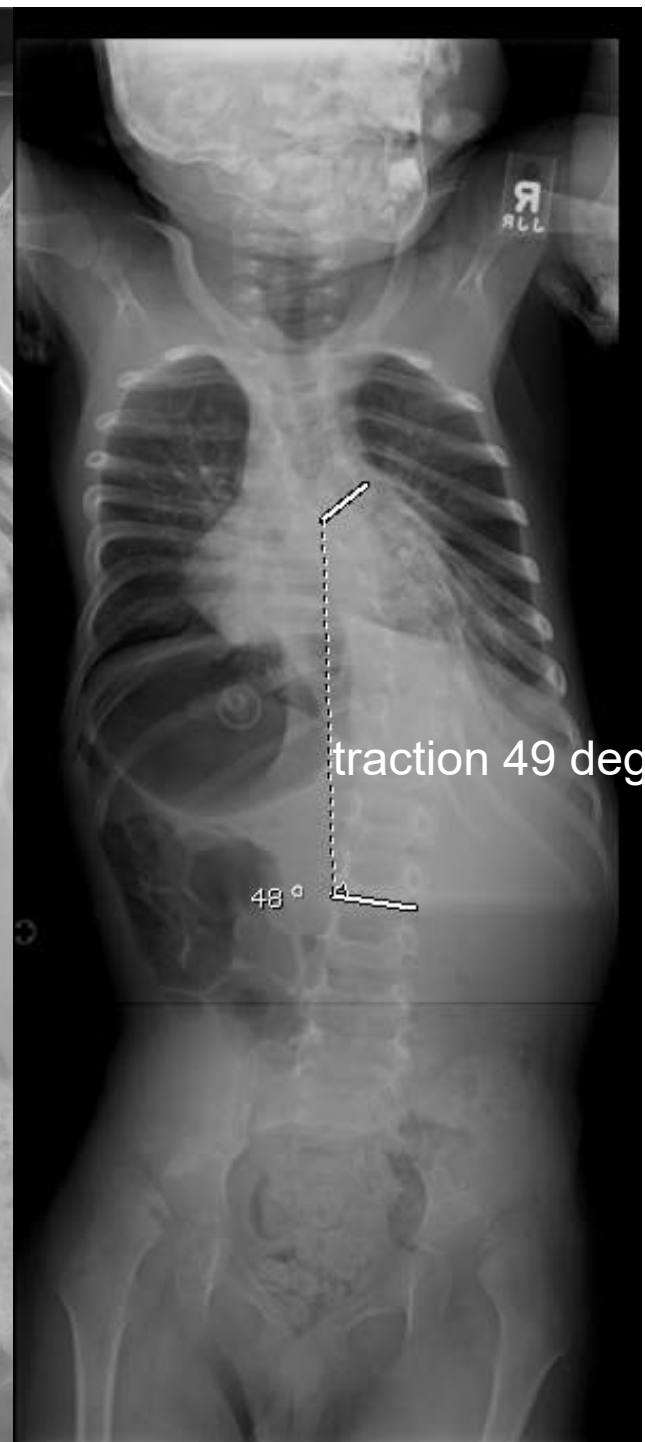
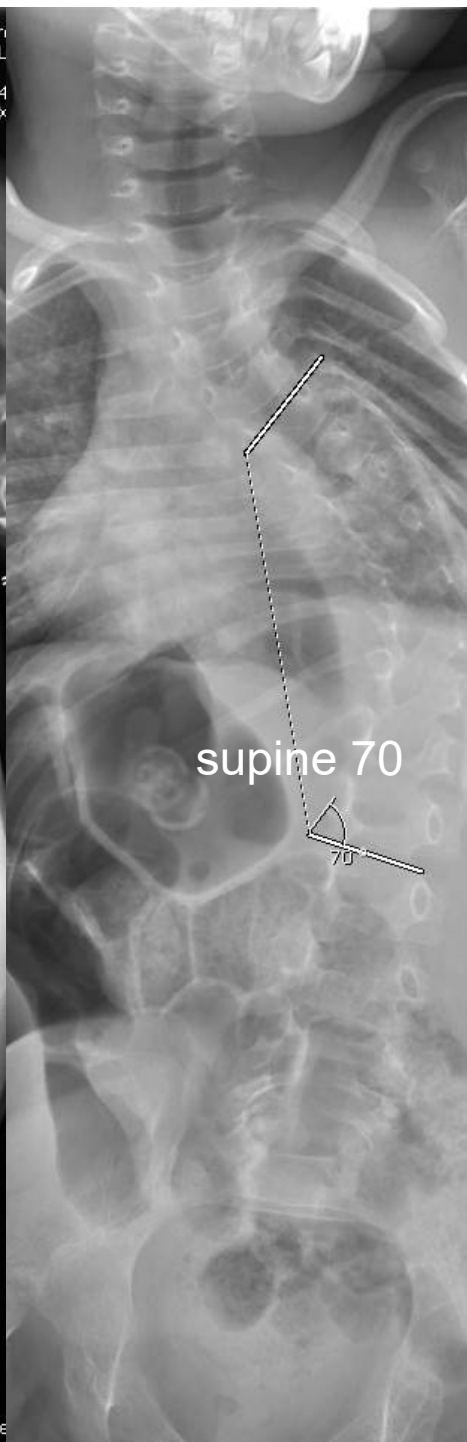
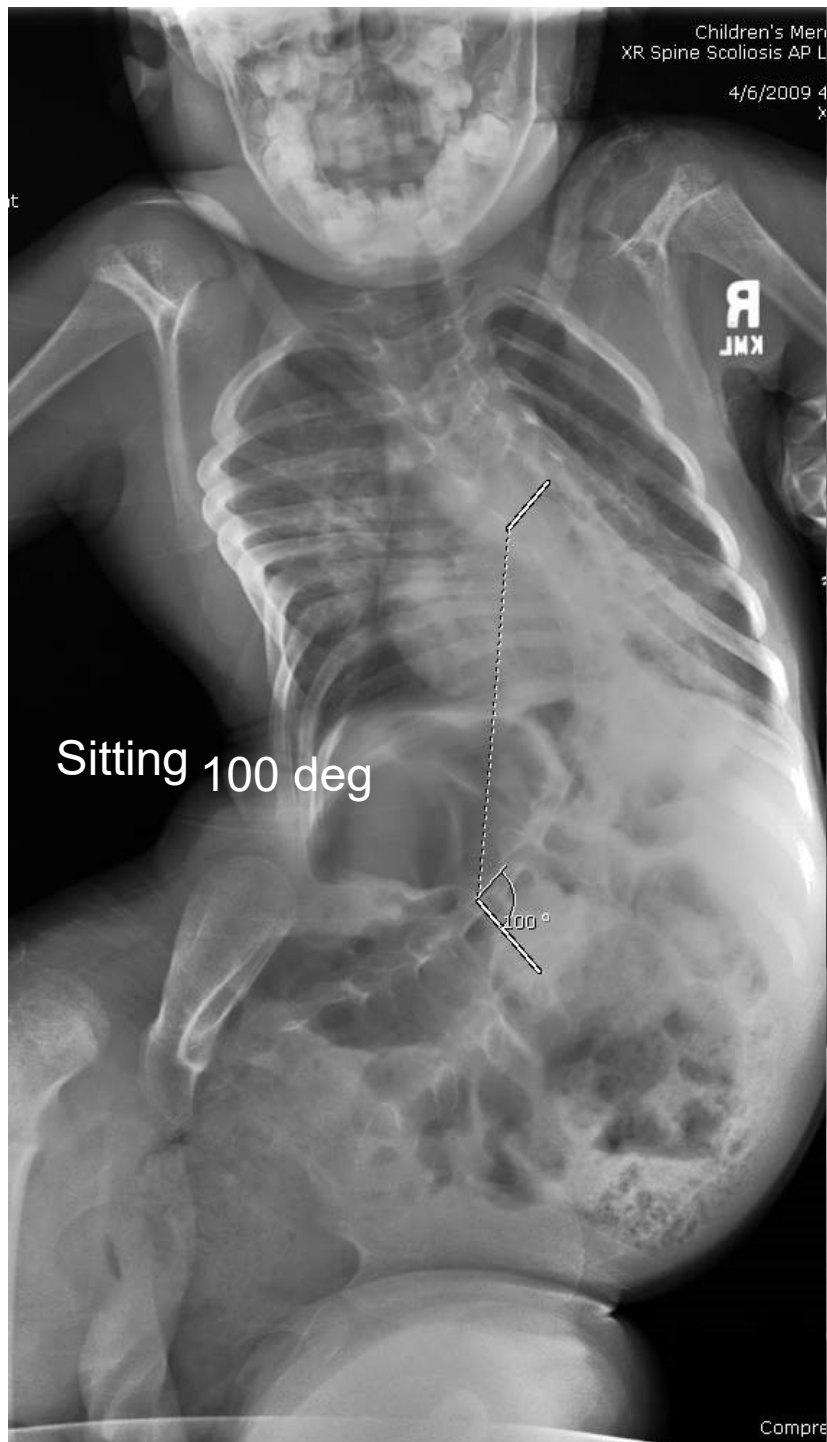
- 4 year 3 month old
- Microcephalic cerebral palsy
- Recurrent aspirations and pneumonia
- Progressive curve of 100° in lower thoracic spine
- 17 kg





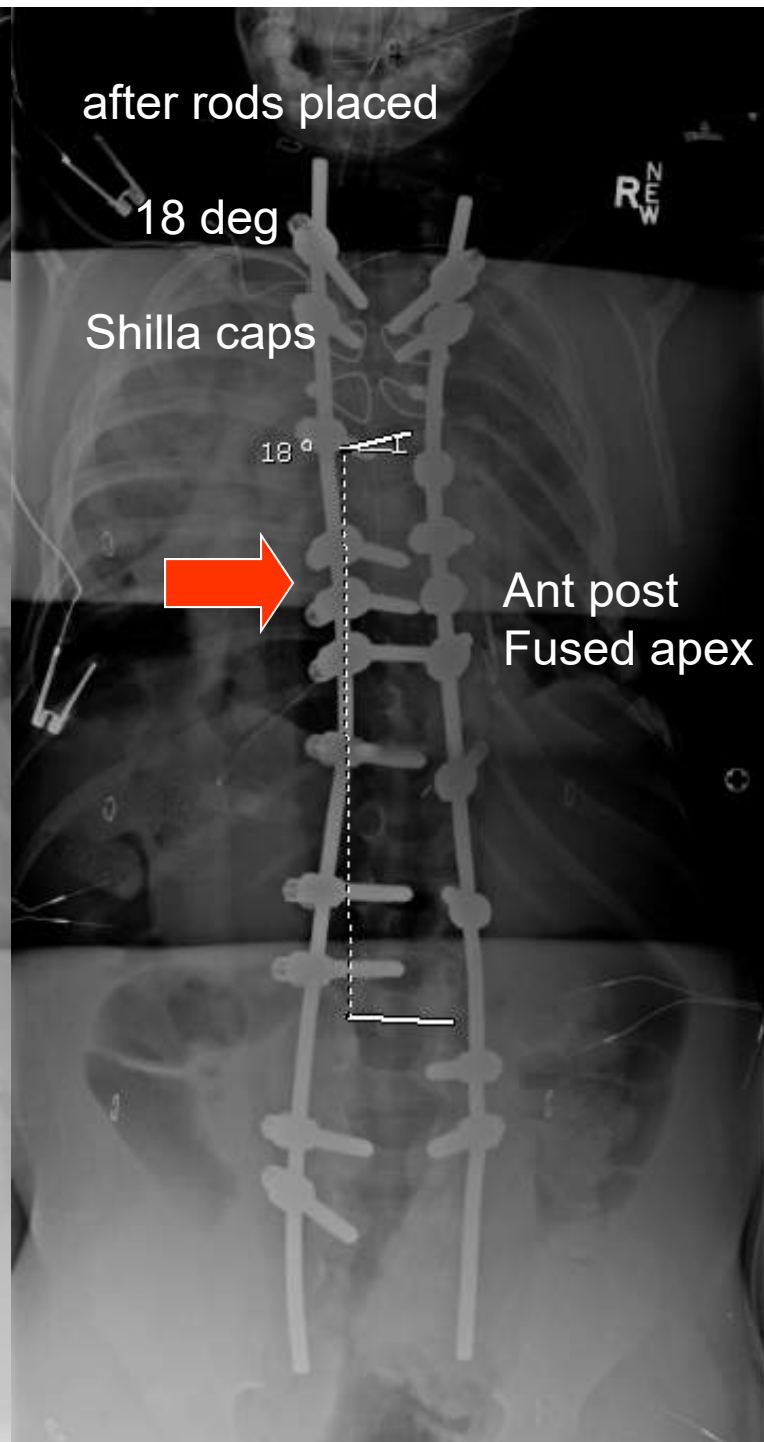
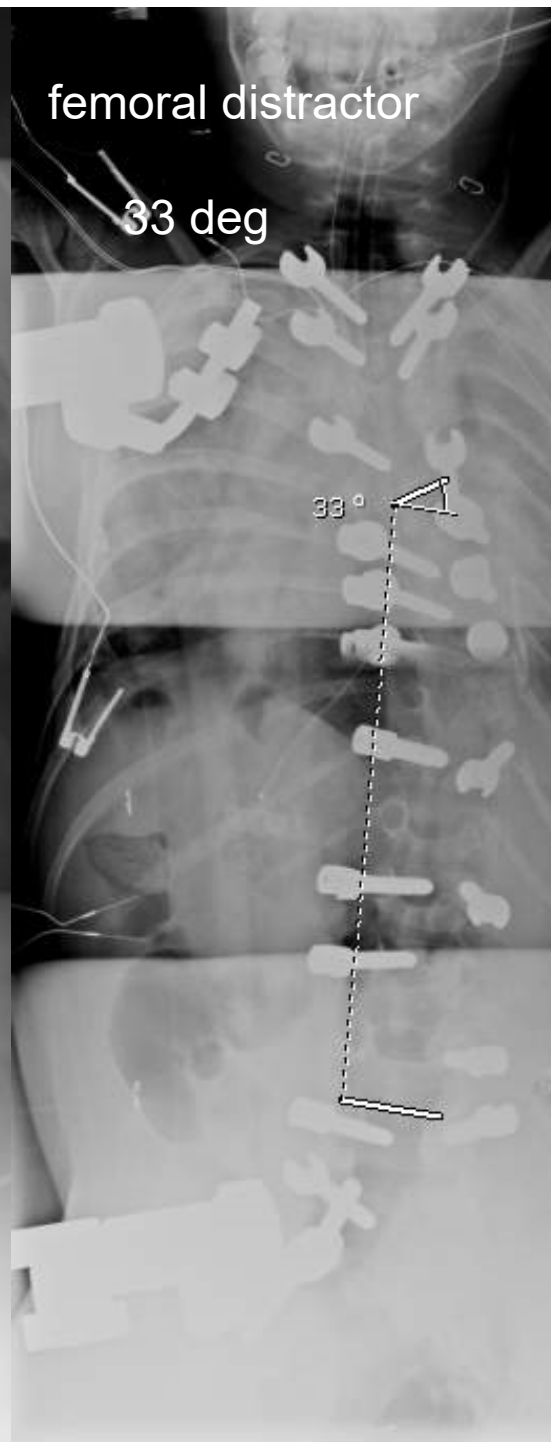
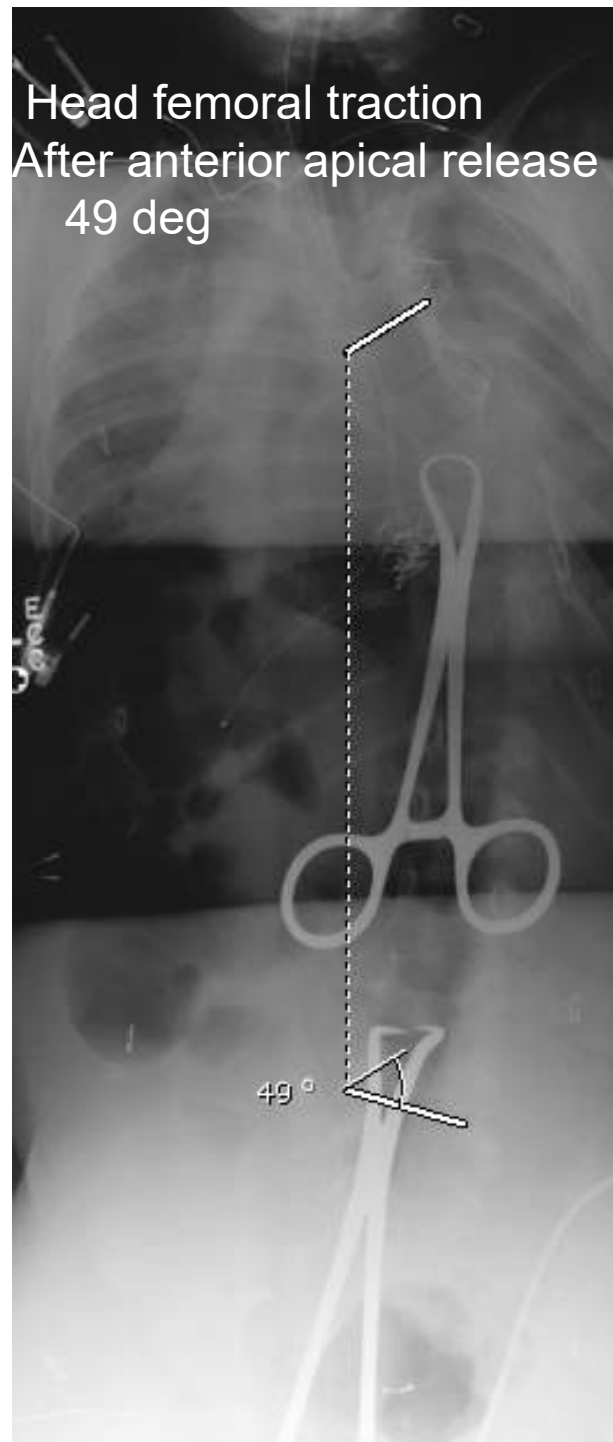
upright

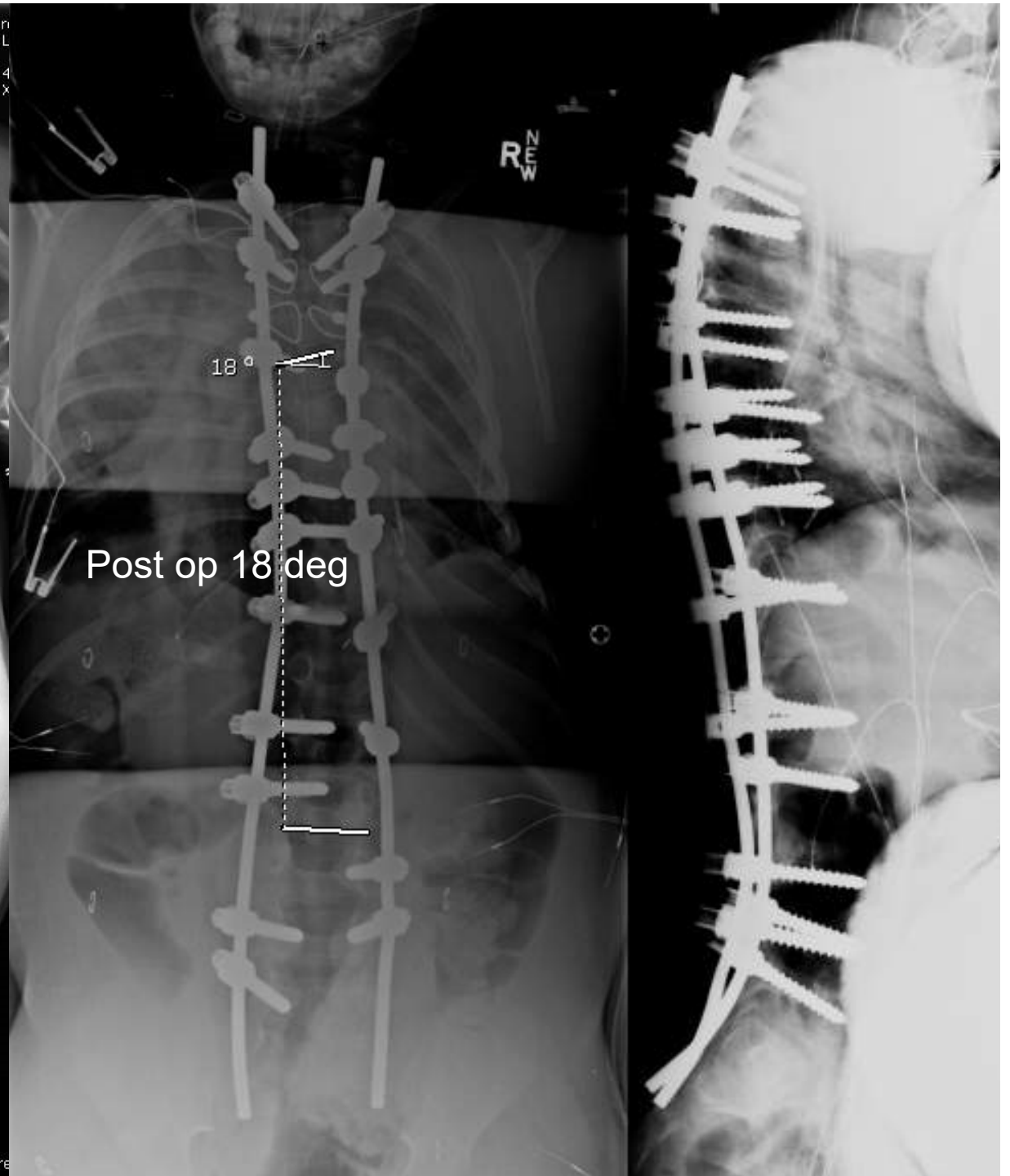












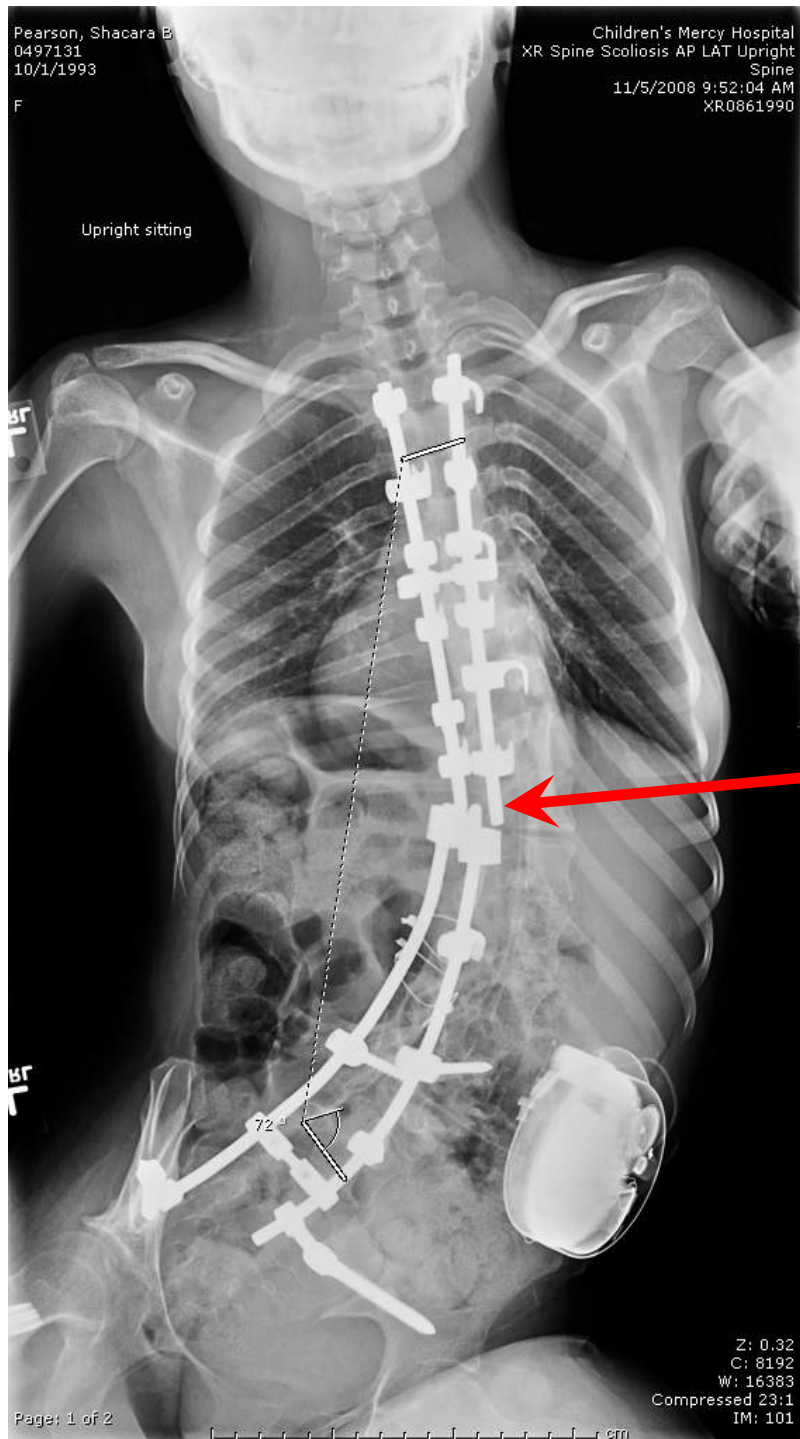
Case 3: Intraoperative compression for SPO in fixed deformity

- 15 year old female
- CP GMFCS 4 progressive neuromuscular scoliosis. Motor WC
- PSFI at age 10 years. Never was happy with post op balance.
- Difficulty sitting. Iliac screw eroding through skin and severe back pain.



Fixed spine deformity

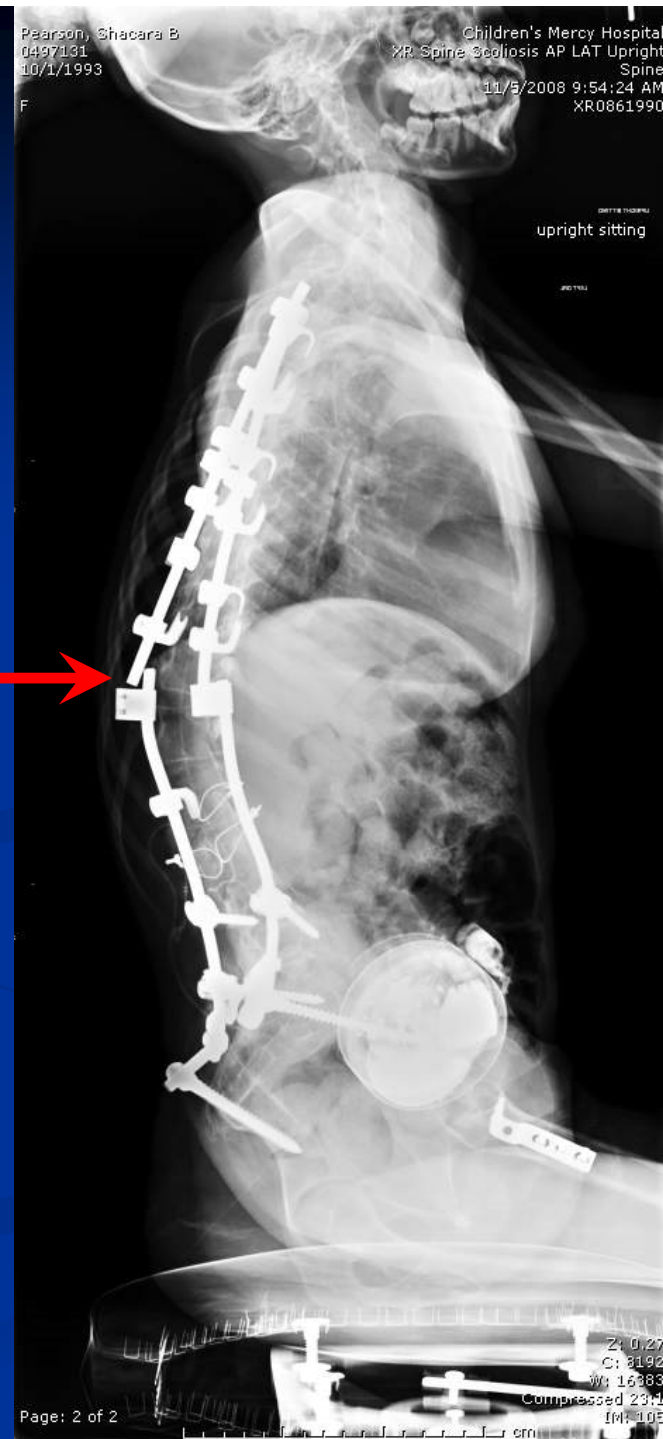





Original surgery
Was never
Balanced

Now pain and
broken implants

72 degree scoliosis







After anterior
release T10-L4

Posterior implants
removed, new
screws placed.

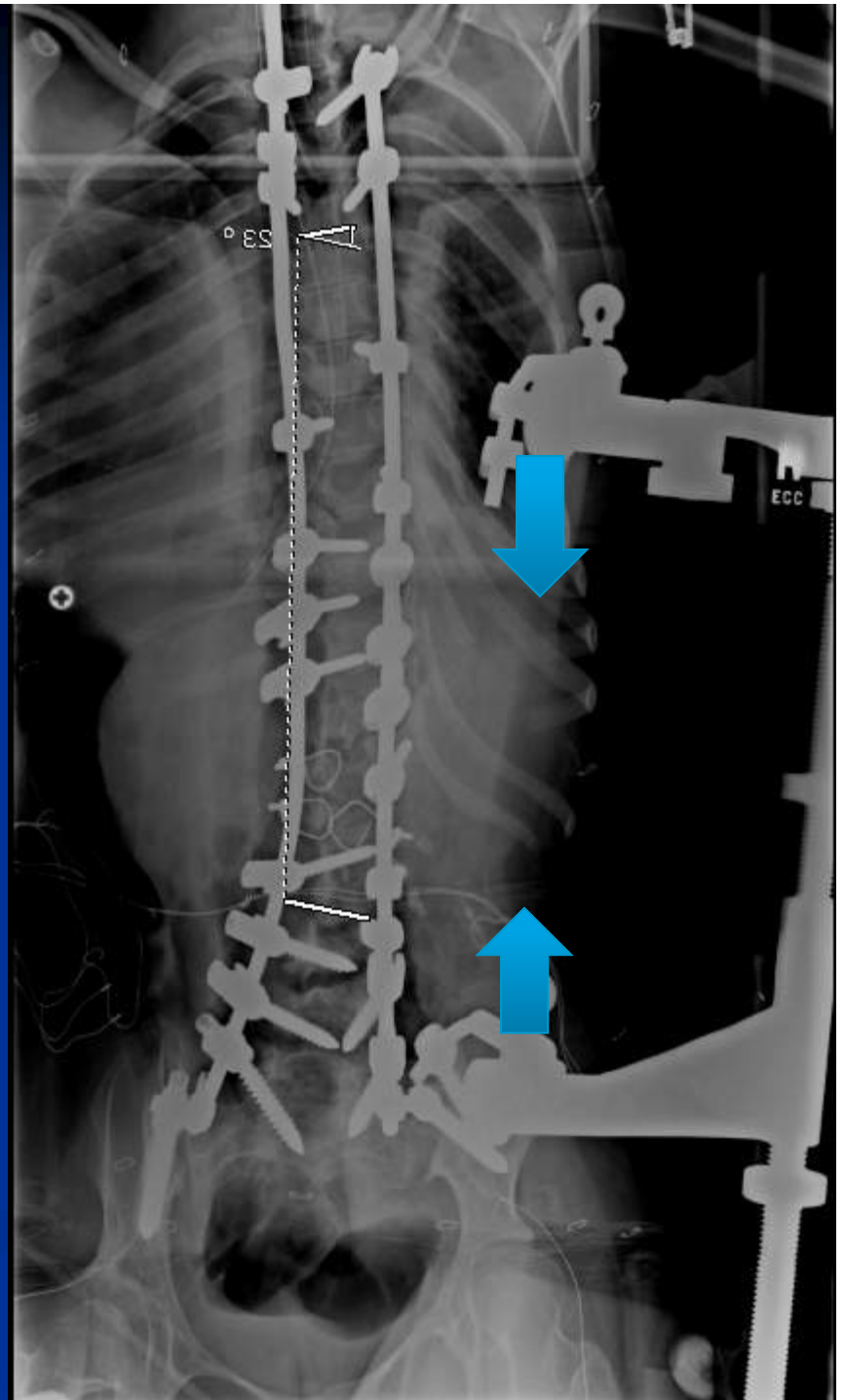
Multiple SPO
T7-S1





Gradual 6 cm
shortening of
femoral
compressor

Rods
placed.



Pearson, Shacara B
0497131
10/1/1993

Children's Mercy Hospital
XR Spine Scoliosis AP LAT Upright
Spine
11/5/2008 9:52:04 AM
XR0861990

Upright sitting

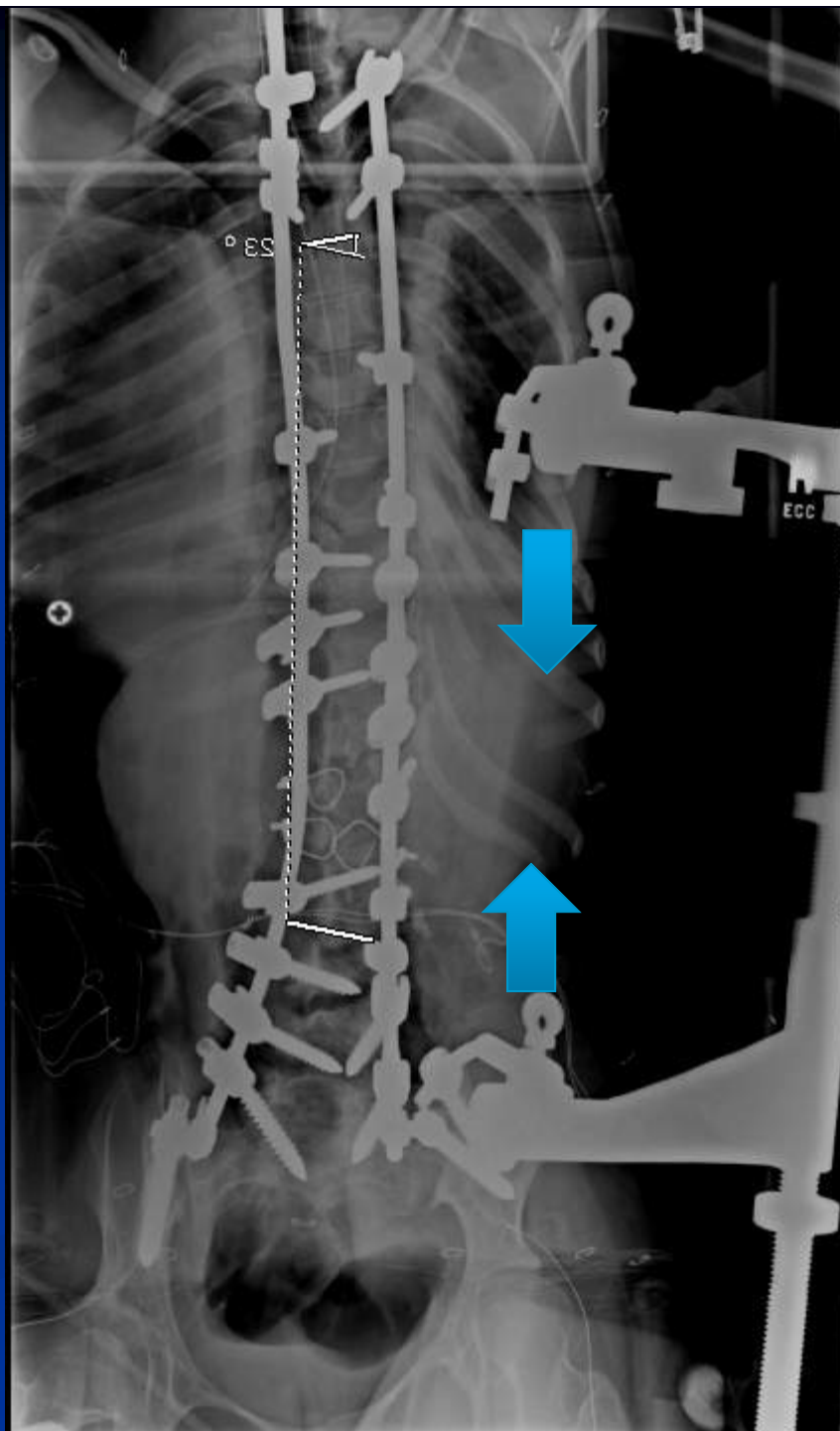
Preop
72 deg

Postop
23 deg.
No VCR.
Balanced spine over
level pelvis.

Z: 0.32
C: 8192
W: 16383
Compressed 23:1
IM: 101

Page: 1 of 2

1 2 3 4 5 6 7 8 9 10 11 12 cm





Post op



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The Miracle Spine Distractor

- If it works, it's a miracle.
 - schwend



- What I learned from this meeting:
- Growing rods are not are great advertised.
- Size is important, but is not everything.
 - Mrs. Elaine Butterworth