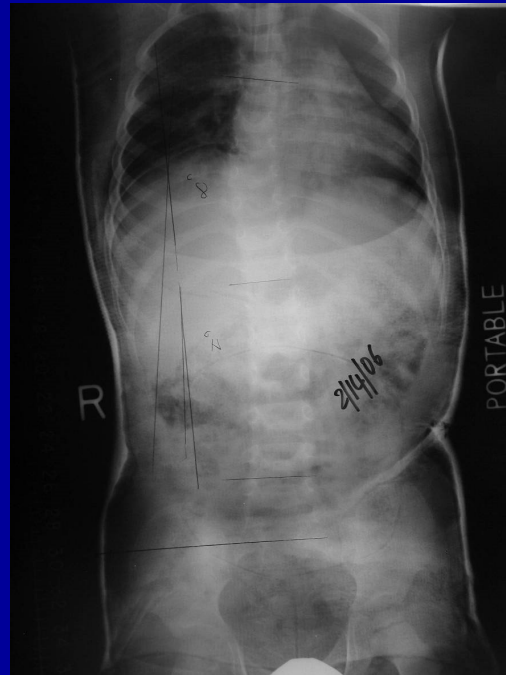


# Cotrel Derotation Casting For Progressive Infantile Scoliosis



James O Sanders, MD <sup>1</sup>

Jacques D'Astous, MD<sup>2</sup>

Marcie L Fitzgerald, PA-C<sup>3</sup>

Joseph G Khoury, MD <sup>4</sup>

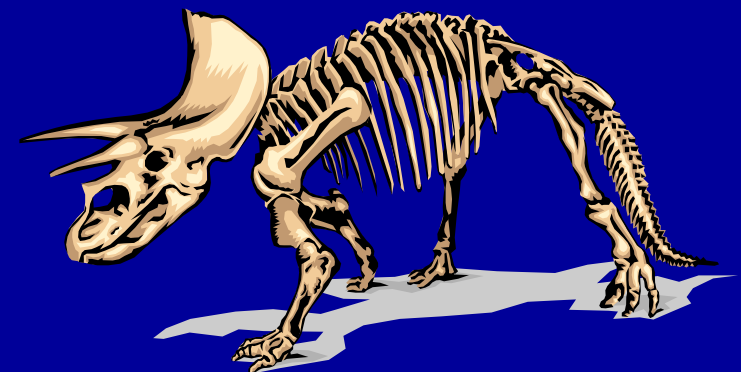
Shyam Kishan, MD <sup>5</sup>

Peter F Sturm, MD<sup>6</sup>

1. University of Rochester, Rochester, NY
2. Shriners Hospitals for Children, Salt Lake City, UT
3. Shriners Hospitals for Children Erie, PA
4. University of Alabama, Birmingham, AL
5. Loma Linda University, Loma Linda, CA
6. Shriners Hospitals for Children, Chicago, IL

# The Word on the Street about Scoliosis Casting

- Risser casting has a high incidence of rib deformity and cast sores.
- Modern instrumentation has made casting obsolete for obvious reasons.
- Casting and dinosaurs should be discussed together.

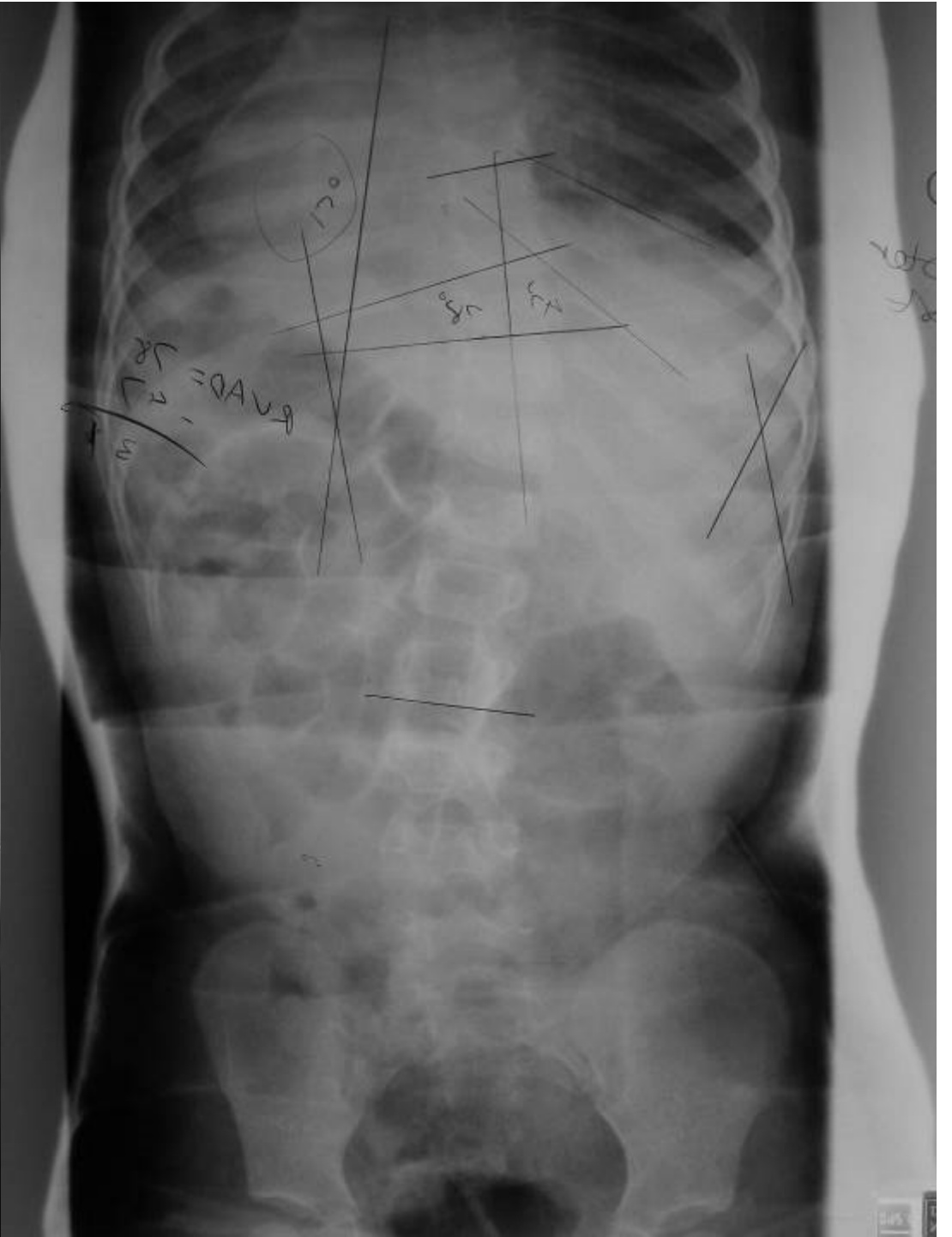
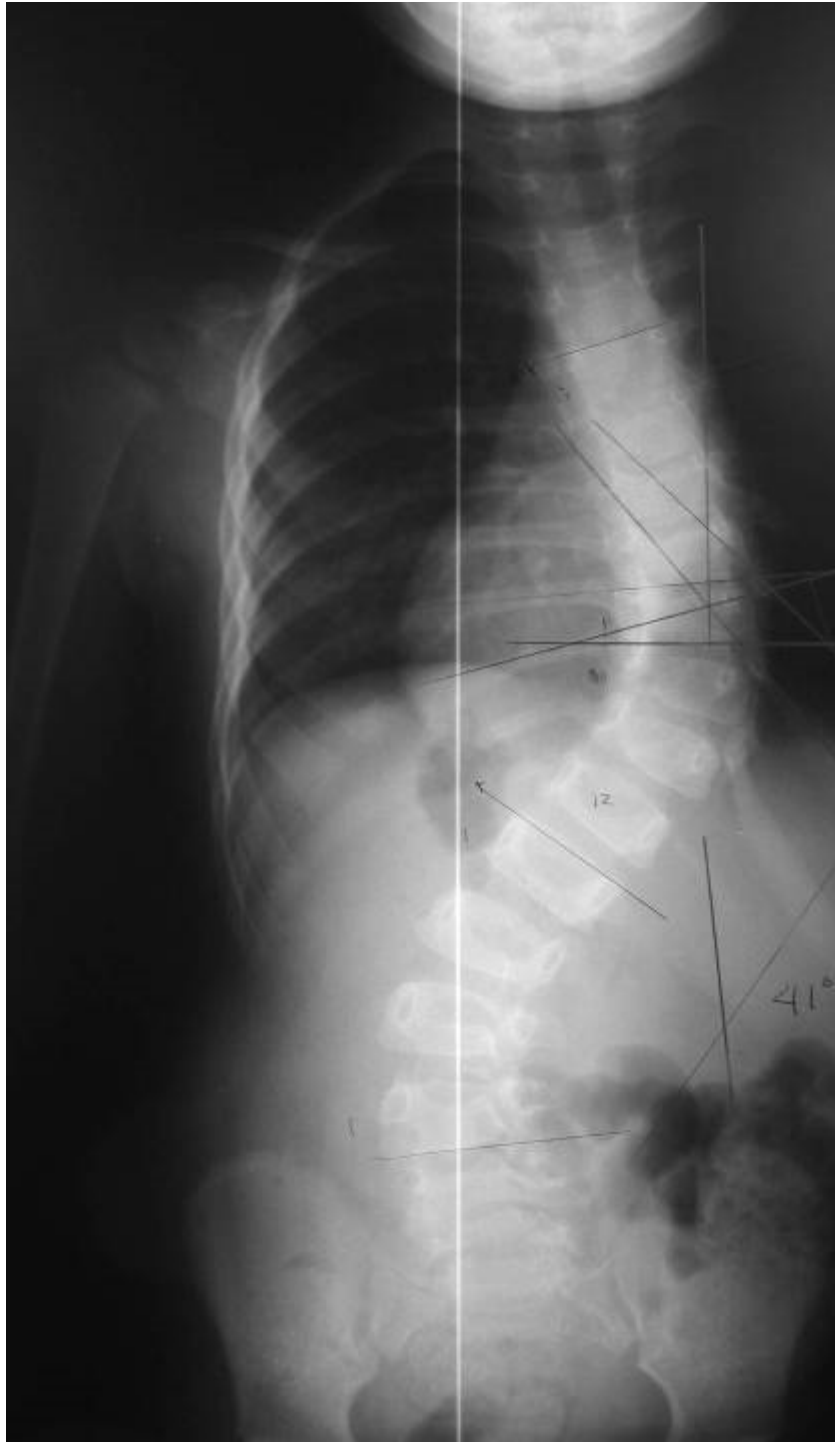


## The Problem with the “Word on the Street” about Scoliosis Casting

- Previously, casting was used indiscriminately for all scoliosis.
- Instrumentation is not great for infantile curves:
  - Stiff spines (Growing Rods)
  - Crankshaft
  - Limited growth potential
  - Stiff chests (VEPTR)
- Does early clubfoot surgery = scoliosis surgery?
- Does Ponseti casting = early onset scoliosis casting?

# Differences between Cotrel and Risser casting:

- Risser
  - *3 point bend*
  - Concern is Cobb angle
  - Cannot address rotation effectively
  - Deforms ribs in young children
- Cotrel
  - *a twist and a shift rather than a push and a bend*
  - Primarily addresses curve through correction of the rotation
  - Goal is to improve the chest wall deformation



# Tricks and Tips

- You need a proper table.
- A mirror to look underneath is very helpful.
- Use only enough traction to narrow the body.
  - Spring Effect
  - Once the traction is off, there is nothing to hold correction unless you go under the chin and occiput.
- Mold the pelvis well – it's the foundation.
- Make a big window on the posterior concavity (learned from Mehta)
  - Pressure relief, ?Dynamic curve correction?, Improves rotation
- Questionable whether routinely over the shoulders is necessary
  - Low apex curves are typical
  - Does not seem to effect the results

**To the Rack!!**

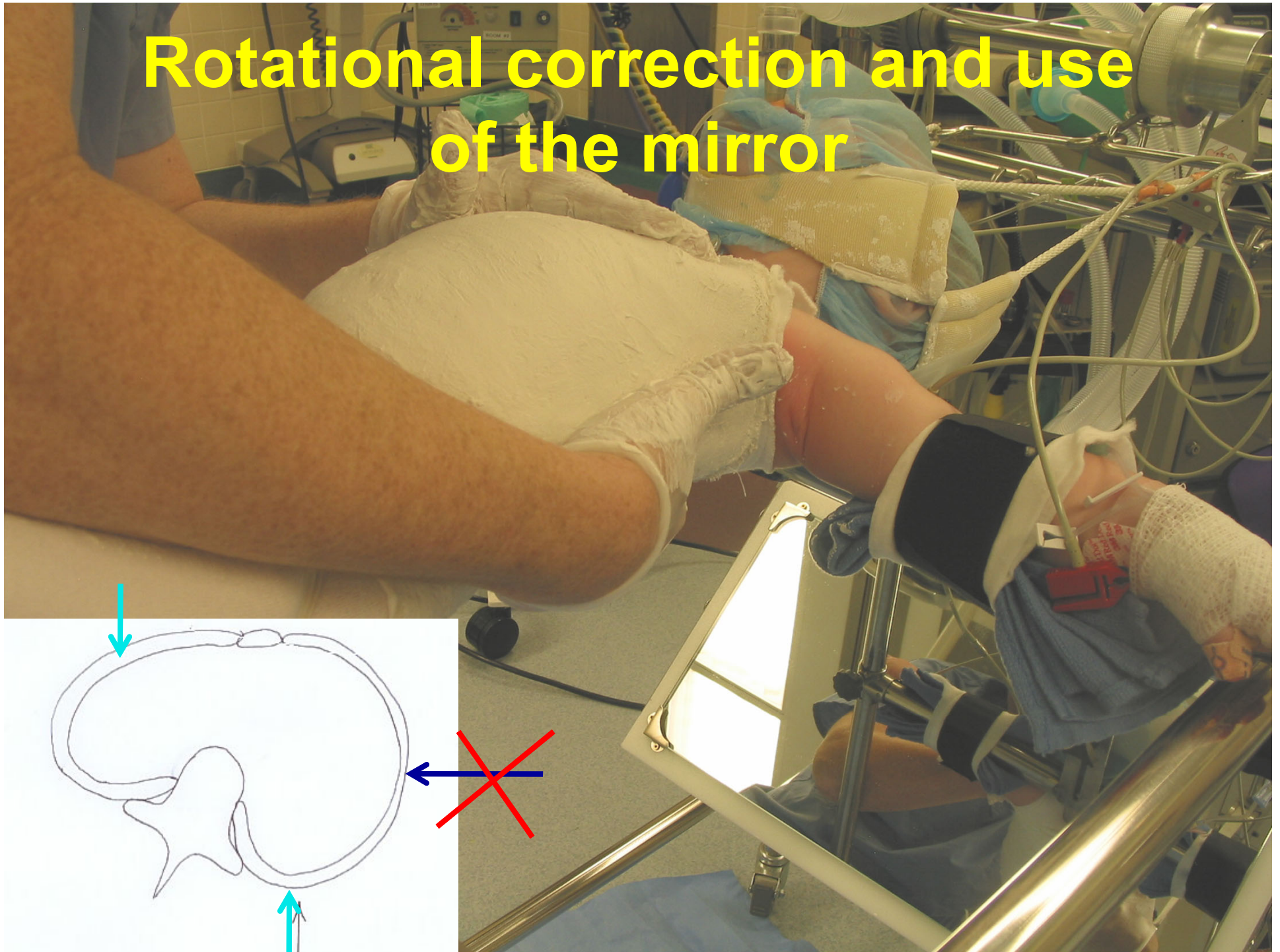


# Pelvic Mold





# Rotational correction and use of the mirror



# WINDOWS



# Casting is well tolerated



# Protocol

- Cast changes based on age:
  - $\leq 2$  yrs, q2 months
  - 3yrs, q3 months
  - $\geq 4$ yrs, q4 months
- Cast until gone or stabilized
- Bracing holidays periodically in older children.
- Brace for 1 year after correction

## Subjects:

- 53 patients with progressive infantile scoliosis had more than one year of follow-up from the initiation of casting
- Most greater than 2 years follow-up

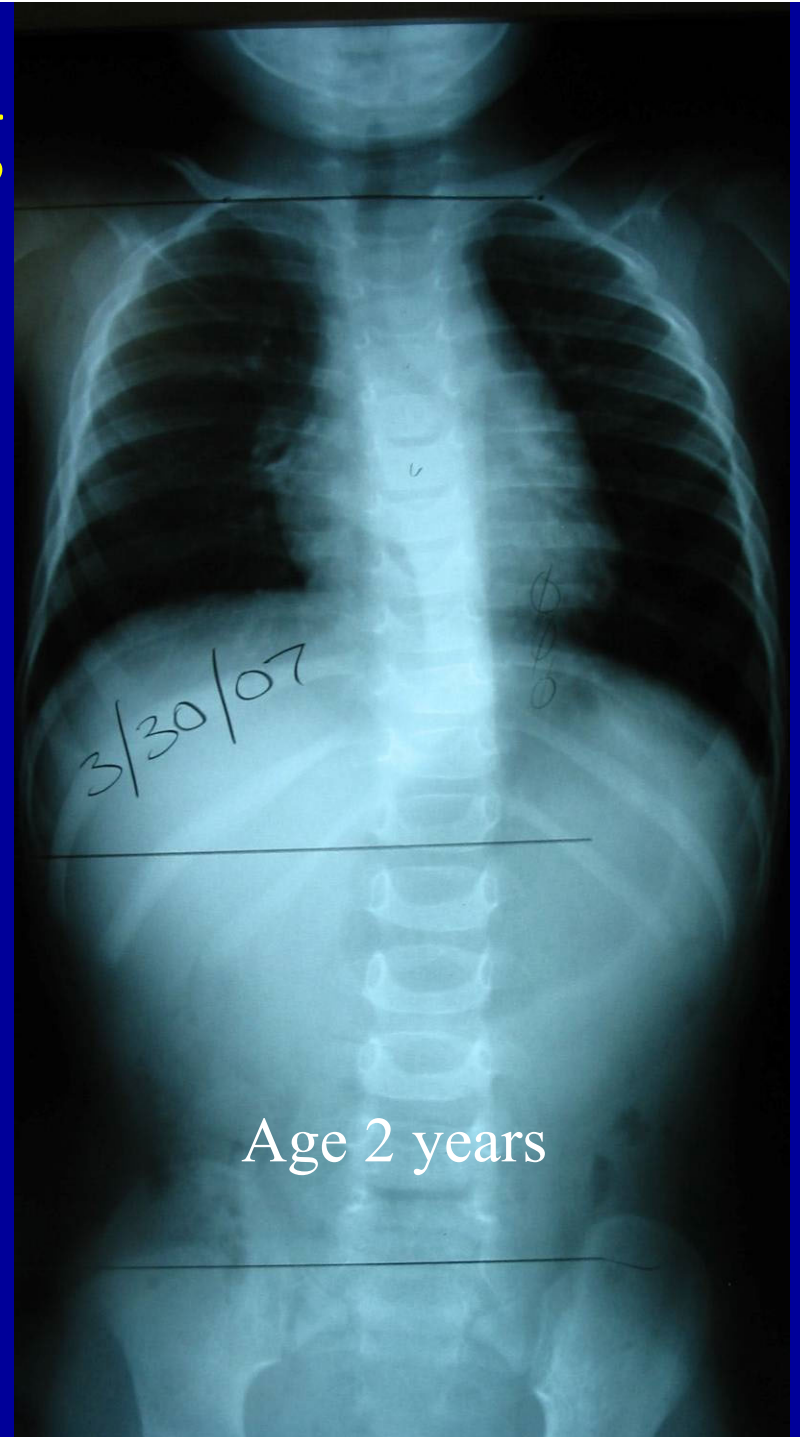
# Results:

Follow up Cobb Angle	#	Age at Start	Cobb at Start	RVAD at Start	Nash at Start	Etiology
<10	14	1.1	37	26	1.9	13 idiopathic 1 tethered cord
11 to 21	10	2.2	41	20	2.2	8 idiopathic 1 tethered cord 1 syndromic
21 to 40	12	2.6	53	33	2.4	7 idiopathic 5 syndromic
>40	12	3.1	71	37	2.6	5 idiopathic 7 syndromic
Cobb worsened.	5	2.1	71	48	2.2	1 idiopathic 4 syndromic

## Results:

- All but five patients responded to the casting.
- Six patients have undergoing surgery to date
  - 4 because of worsening and 2 by parent choice.
- The SAL improved from 0.89 to 0.93.
- No patient experienced worsening rib deformities.

# Pre and Post Casting



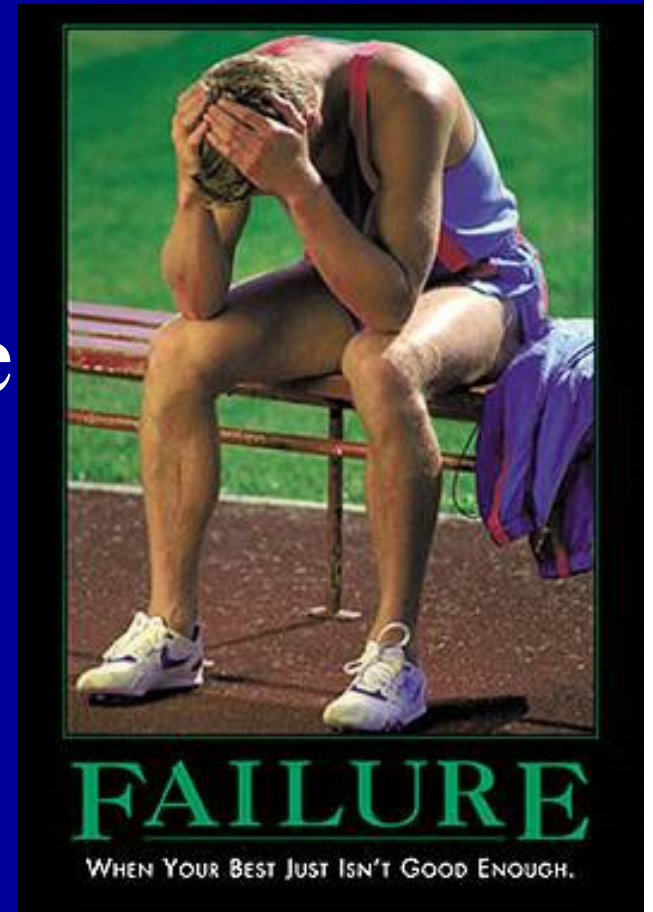


# Prognosis

- Better with:
  - Younger Age at Start
  - Idiopathic Diagnosis
  - Moderate rather than Severe Curve (<60 degrees though success up to 60 degrees)

# What Constitutes Failure?

- Curve worsened = True Failure
- If not cured but it beats the natural history or other treatments, it's probably good.
- Delaying surgery while preserving lung growth is good



# Summary of Our Early Experience

- Most curves respond.
- Younger and non-syndromic patients respond faster than older patients
- Older and syndromic patients improve (delay surgery)
- Patients tolerate it very well.
- Chest wall deformity does not seem to be an issue with proper casting.
- The spines seem to remain flexible.

Younger, Smaller, Idiopathic – Don't wait. Cast to  
Cure.

Older, Larger, Syndromic – A Good Delay Tactic – no  
need to rush to surgery.

Thank you!

