Factors Predicting the Cobb angle after Casting for Progressive Infantile Scoliosis

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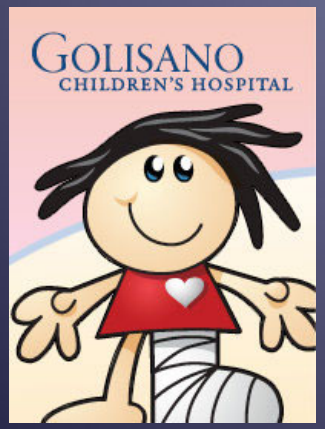
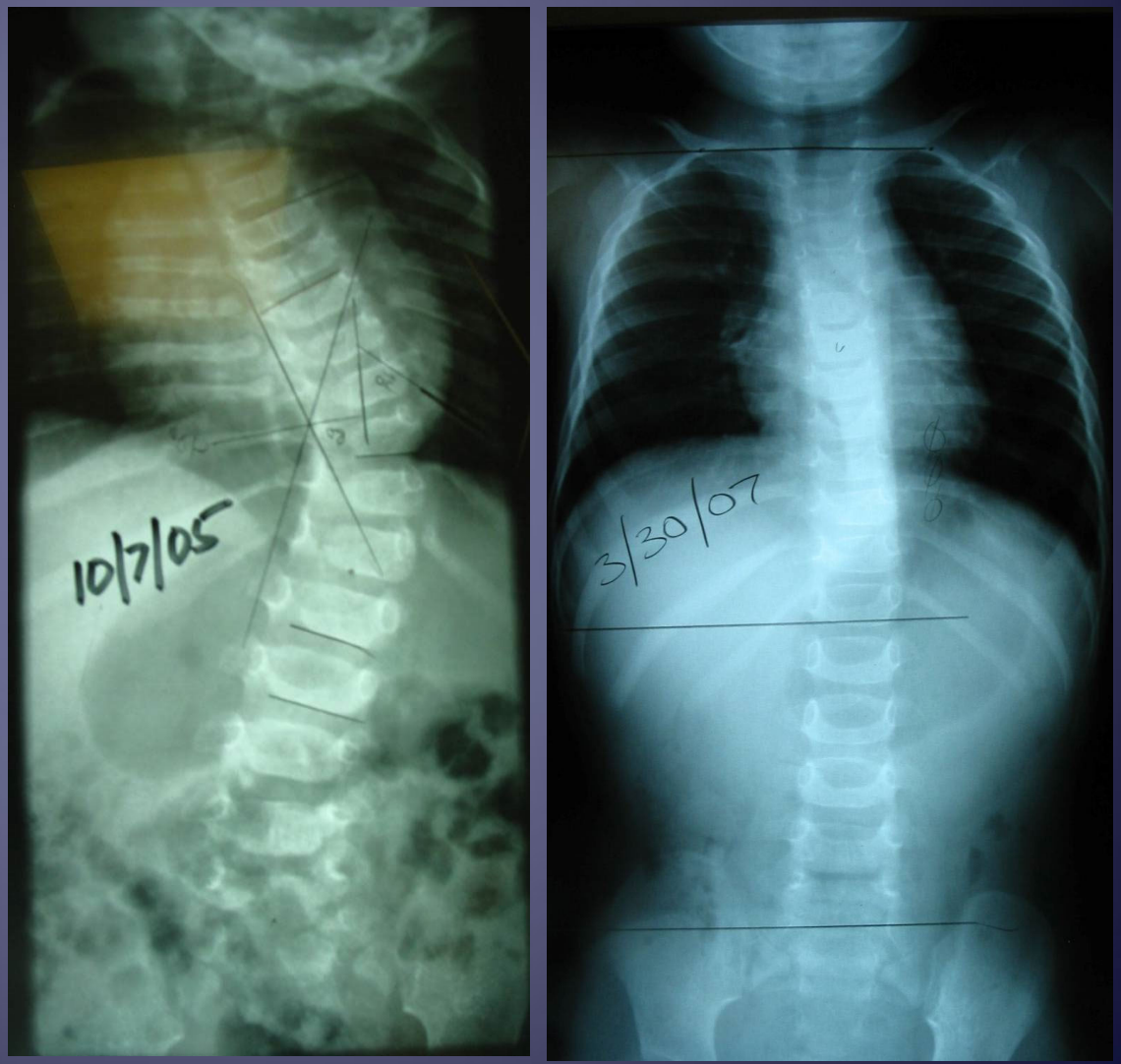


How Good Is Casting – Really?

- Casting for Infantile Scoliosis seems to have an important role.
- But, how good is it?
- How often does it work?

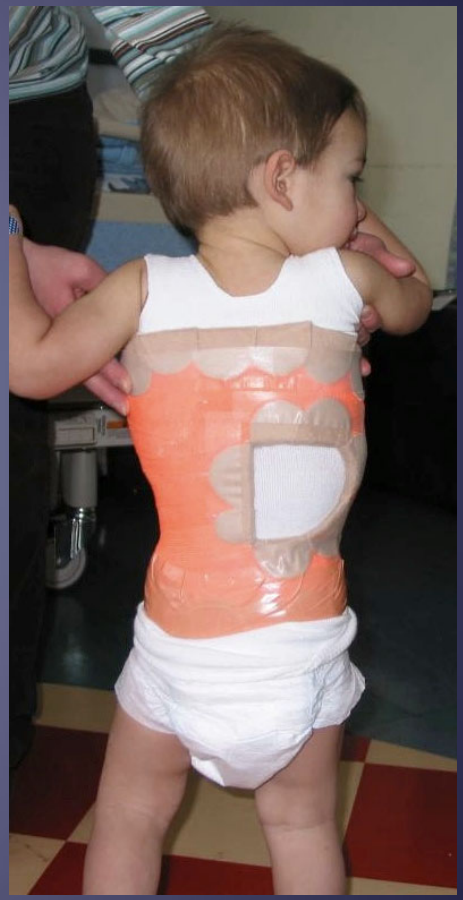


"Work" can mean several things:

- Curves go away
- The curve decreases markedly, doesn't progress during the short-run but still might progress during adolescence.
- The curve decreases, but subsequent growing rods are still needed to control the curve.
- Failure likely means early surgery becomes unavoidable.

This Study Asks:

- Since the Cobb angle remains our gold standard for measurement, what factors are predictive of the Cobb angle at the end of cast treatment?
- Also, what factors are predictive of patients needing surgery?
- In general, if curves do not resolve, how long is surgery (e.g., growing rods) delayed?



Methods:

- 70 patients with progressive infantile scoliosis treated with serial casting followed prospectively.
- Progressive Curve Definition:
  - RVAD greater than 20 degrees in curves more than 20 degrees
  - Or rib phase 2
  - Or documented curve progression
- Some of these patients had treatment prior to being seen by the investigators – bracing or casts.

Methods (cont)

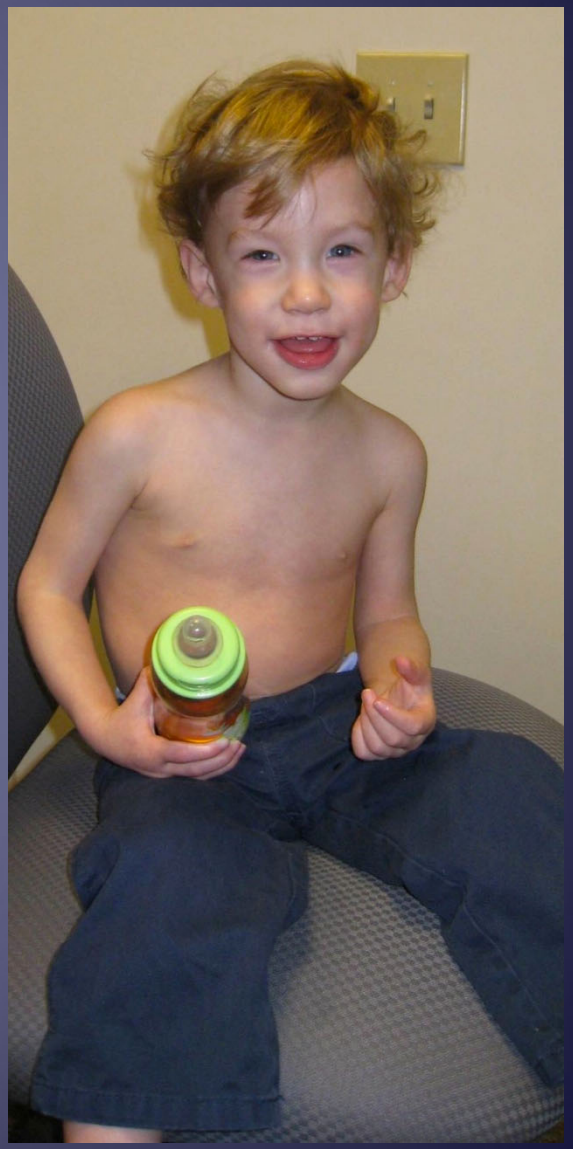
- Outcomes:
  - Magnitude of the Cobb angle at the end of cast treatment
  - Whether the curve had progressed to surgery during the time of follow-up.
- Cobb angle analyzed by multiple regression
- Odds ratios of resolving, not resolving, and progressing to surgery calculated for the most important identified factors.

Results

- Follow-up was 1.2-9.2 years (mean 3.0).
- At the end of casting:
  - 27% Resolved
  - 57% Improved By ≥10°
  - 13% Remained Stable
  - 3% Progressed >10°
  - 11% Surgical Intervention During The Study Period
  - Surgery occurred on average 2.7 years after the initiation of casting in the 8 patients.

Results (cont)

- Factors loading on multiple regression for Final Cobb at end of casting ($p<0.001$):
  - Age
  - Cobb
  - RVAD
  - Syndromic etiology



Important factors:

- Of curves <50° at initiation:
  - –40 % resolved
  - –2.1 % (1 patient) went on to surgery
  - –Surgery 2.8 years after the initiation of casting.

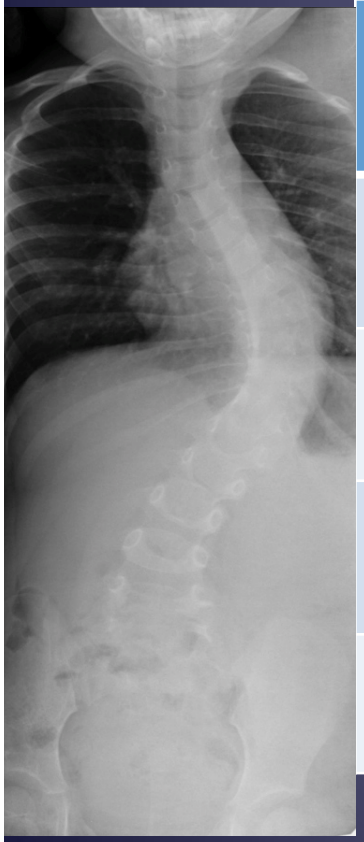
Important Factors

- Only one patient with an initial curve ≥50° resolved.
- No patients with an initial curve >55° resolved.
- Of curves ≥50°:
  - 4 % (1 patient) resolved
  - 28 % went on to surgery during follow-up
  - Surgery averaged 2.7 years after the initiation of casting.

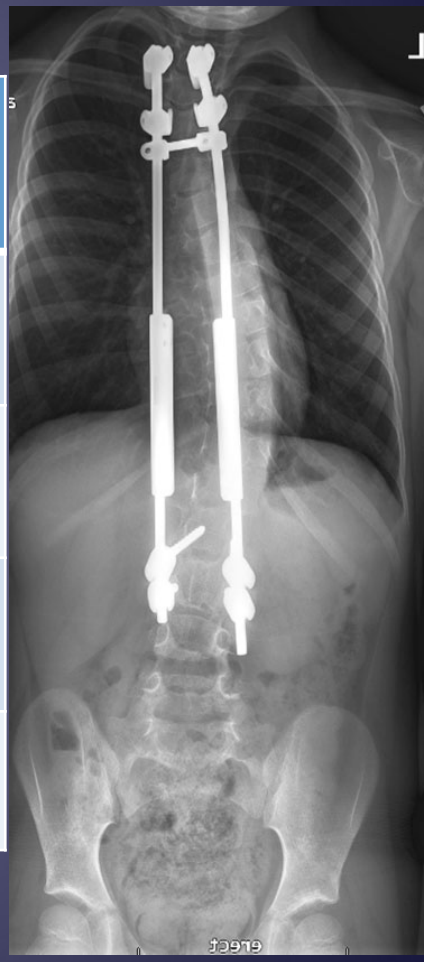
Odds Ratios of Curves Not Resolving

Factor	OR For Curve Not Resolving	95% CI
Age >24 months	23.73	2.94 -191.55
Initial Cobb >50	13.66	1.69 -110.21
Phase 2	4.74	1.53 - 14.22
Syndromic	4.63	0.96 - 22.37

Odds Ratios of Surgery

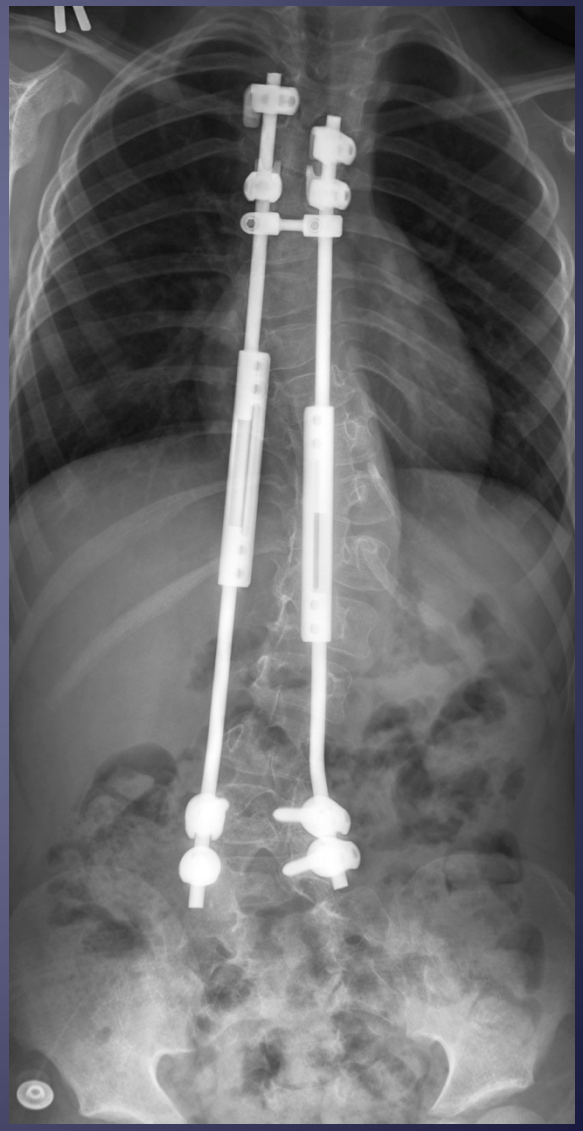


Factor	OR for Surgery	95% CI	P Value
Initial Cobb >50	21.9	2.5 - 193	0.005
Syndromic	5.2	1.1 - 24.4	0.036
Age >24 months	4.8	0.9 - 25.4	0.069
Phase 2	5.8	0.67 - 50	0.111



Surgery During Follow-Up by Final Cobb

- <20° - None
- 21-40° - One
  - during bracing progressed markedly
- > 40° - 7 patients (54%)



Conclusions:

- The Cobb angle at the end of casting is highly dependent on the Cobb angle, age, RVAD and etiology at cast initiation.
- Curves >55 degrees are unlikely to resolve with casting
- If you get the chance, cast early rather than late.
- But, even without resolution, surgery occurred in only 8/70 (11%) at average 3.0 years follow-up
  - and delayed in those by average 2.7 years.