

Effectiveness of Casting in Non-Idiopathic Scoliosis

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FOR CHILDREN



Background

- Casting is an effective method used to delay or definitively treat infantile idiopathic scoliosis
- Effectiveness of casting in non-idiopathic is unknown
- Objective: to analyze the outcomes of casting series in non-idiopathic scoliosis



Design & Methods

- Consecutive prospective series of non-idiopathic EOS patients treated casted at a single institution
- Radiographic outcomes measured before and after cast series completion
- Divided cohort into two groups based on treatment after completing cast series:
 - Nonoperative – brace/observe
 - Operative

Diagnoses and Categories

Categories	Diagnoses	N
Stiff syndromic	Arthrogryposis, Marfan, Beals, Stickler, Ehler-Danlos	13
Hyperlax syndromic	O.I., Soto syndrome, Ullrich M.D. , trisomy 7 and 9 syndrome	5
Other neuromuscular	Including static encephalopathy	6
Congenital / NF scoliosis		7
Total		31

Radiographic Results: All Patients

N=31

First cast age: 4 (1-9.2)

Number of casts: 4.1 (2-9)

Months in cast: 11 (2.4-22.1)

Major curve changes

Pre treatment	After last cast	Most recent f/u
64.8 (40-95)	59.4 (11-93)	48.4 (16-104)

Average curve improvement: 16.4°

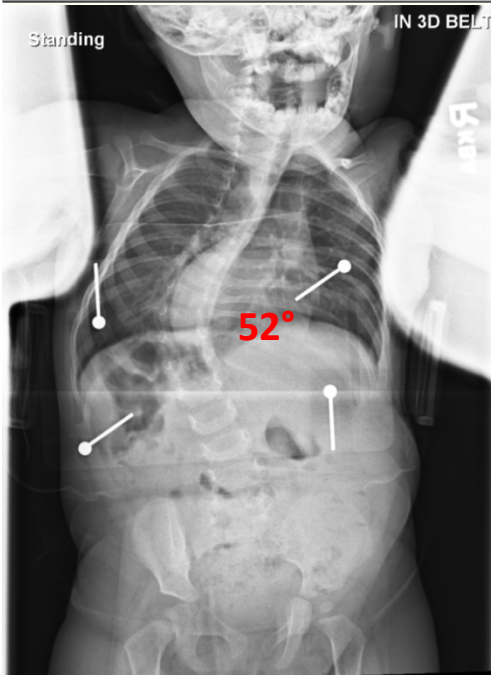
← Incl. postop

Thoracic height T1-T12 changes

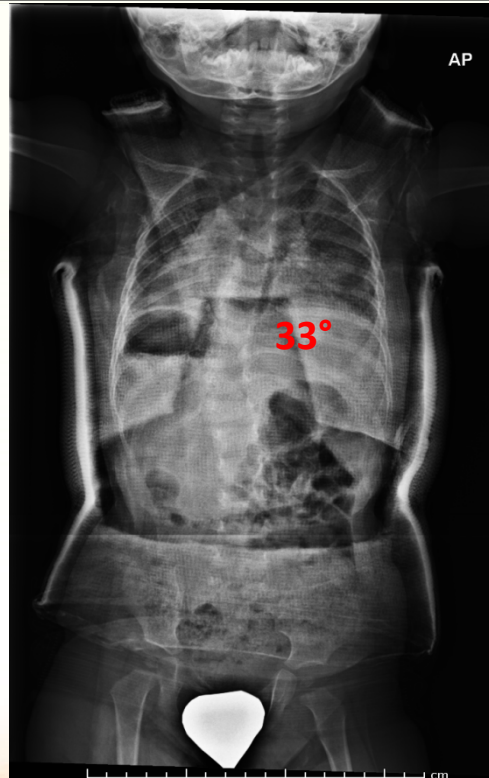
Pre treatment	After last cast	Most recent f/u
144 (87.2-189.2)	155 (116-218.9)	188.5 (110.8-279)

Average thoracic ht gain: 47.2 mm

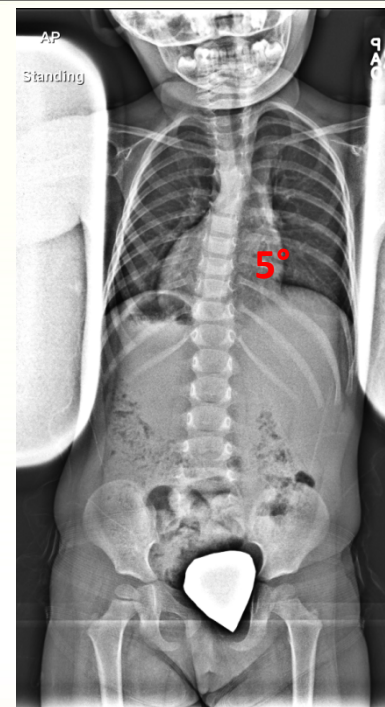
Case study



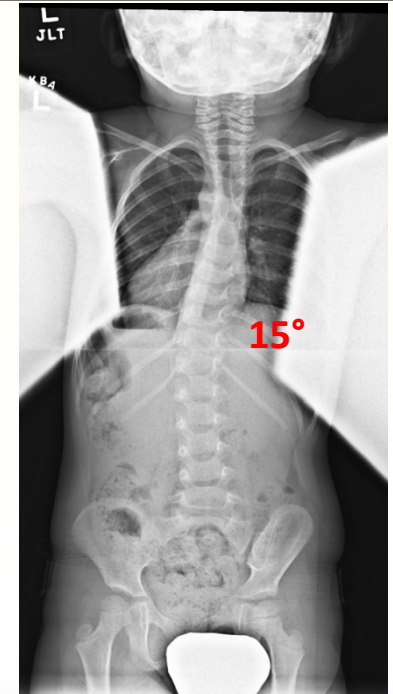
Pre treatment, 15 months
Ehlers-Danlos syndrome
5 casts for 12.2 months



1st in-cast, standing



2 years after last cast
removed. 2+11 yo
Observation only



Most recent f/u
4 years old
Observation only

Radiographic results: Nonoperative

- N=11
- First cast age: 3.3 (1-6.4)
- Number of casts: 4.5 (2-9)
- Months in cast: 9.8 (4.7-17)

Major curve changes

Pre treatment	After last cast	Most recent f/u
61.5 (45-85)	43.9 (11-67)	51.8 (16-80)
Avg major curve improvement: 9.7°		

Post cast series treatment types:

Brace: N=8

Observe: N=3

Thoracic height T1-T12 changes

Pre treatment	After last cast	Most recent f/u
141.3 (109-189.2)	159.1 (130.5-203)	175.2 (151.7-204.8)
Avg thoracic ht gain: 33.9 mm		

Radiographic Results: Operative

N=20

First cast age: 4.3

Number of casts: 3.9

Months in cast: 11.6

Major curve changes

Pre treatment	After last cast	Most recent f/u
66.7 (40-95)	68.3 (36-93)	46.6 (18-104)

Average curve improvement, 20.1°

postop

Thoracic height T1-T12 changes

Pre treatment	After last cast	Most recent f/u
145.5 (87.2-188.7)	152.6 (116-218.9)	194.8 (110.8-279)

Average thoracic ht gained, 49.3 mm

Post cast series treatment types:

- Conventional GR/MCGR: N=10
- Spinal fusion: N=7
- VEPTR: N=1
- Halo w/ surgical treatment plans: N=1
- Anterior tether: N=1

postop

Nonoperative vs. Operative

- **Nonoperatives**
 - casted at a younger age, 3.3 vs. 4.3 years old
 - had more casts, 4.5 vs. 3.9
 - casted shorter time, 9.8 vs. 11.6 months
 - smaller pre treatment major curve, 61.5° vs. 66.7°
- **No statistical difference** in diagnoses between groups.

Conclusion

- Casting in non-idiopathic scoliosis may achieve significant delay if patient treated at a younger age and obtains ~30% deformity correction.
- Older patients (> 4) w/o obvious correction in cast can be expected to require surgical rx
→ casting useful only as a delaying tactic.