

# What Is The Role for Elongation, Derotation, Flexion Casting in Treating Early-Onset Scoliosis in Children With Connective Tissue Disorders?

- Graham T. Fedorak, MD, FRCSC
- Alexandra N. Nielson, BSc
- John A. Heflin, MD
- Jacques L. D'Astous, MD

University of Utah  
Salt Lake City, UT  
Shriners Hospitals for Children, Salt Lake City



**Shriners Hospitals**



# Background

- Concerns exist regarding the potential for skin complications when EDF casting is used to treat EOS in children with connective tissue disorders.
- There are no assessments of the effectiveness of EDF casting in treating EOS in this population.



# Methods

- Retrospective review of patients treated for EOS associated with CT disorders with EDF casting at a single center between 2000-2016
- 4 patients with Marfan's Syndrome
- 1 patient with Loeys-Dietz Syndrome



# Methods

- Demographic, treatment, and radiographic variables assessed
  - Prior to 1<sup>st</sup> cast
  - After each subsequent cast
  - At transition to another treatment method (bracing, surgery)
  - At final follow-up



# Results

- At initiation of casting:
  - Mean of 3.4 years of age (1.6-5)
  - Mean Cobb angle of 56.2° (37-68°)
  - Mean traction Cobb angle of 27.3° (14-42°)
    - Awake, supine, manual traction
  - Mean flexibility of 52.5% (38.2-62.2%)



# Results

- A mean of 6 casts (3-12) were applied over 2 years (1-4.7).
- Patients were followed for 5.6 years (1-12.0) after initiation of casting, until a mean of 9.1 years (4.5-17.0) of age.



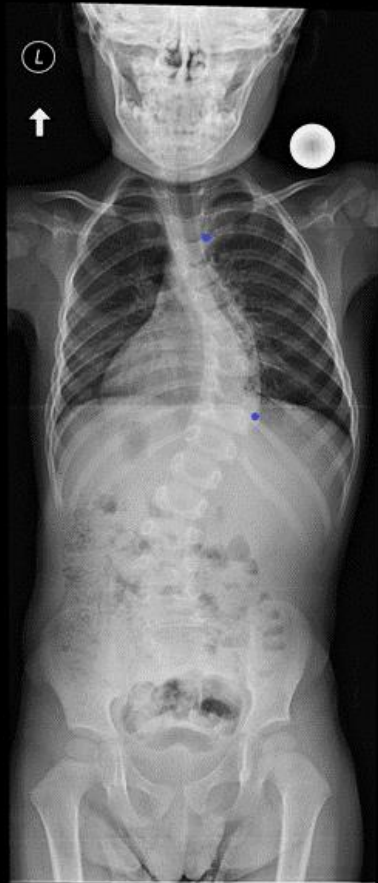
- Cast #10 5+11 yr female with Loeys-Dietz Syndrome; Cobb 75° in cast
- First cast was at 19 months, 68° Cobb angle prior to treatment

# Results

- No skin complications causing delay of casting
- 2 patients currently braced
  - One with 25° out of brace scoliosis at age 4.8 years (6° in brace)
  - One with 57° in-brace scoliosis at age 4.5 years
- 1 patient lost to follow-up
  - 52° curvature in brace at 6.8 years
- 2 patients underwent growth friendly surgery
  - One at 7 years of age
  - One status post final fusion



# Case



Traction



Upright film after  
cast application



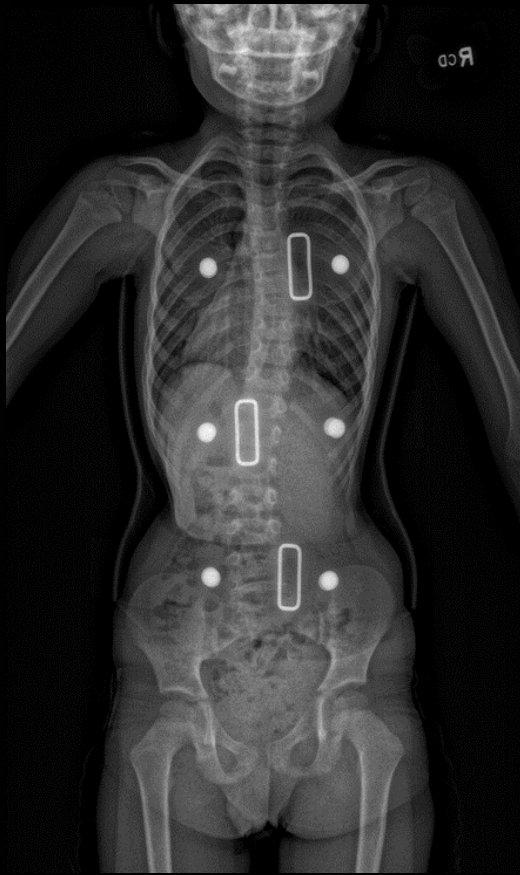
2+4 year male with Marfan's Syndrome  
Cobb = 56° pre-treatment; apex T9; tractions to 28°

3+7 years, cast #6  
Cobb = 12° in cast





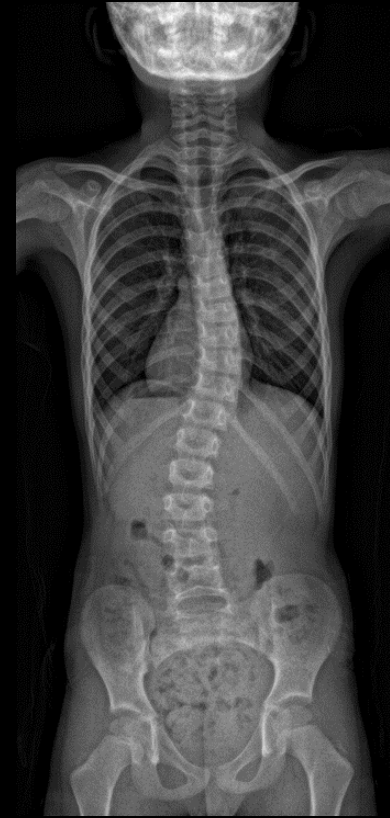
# Case



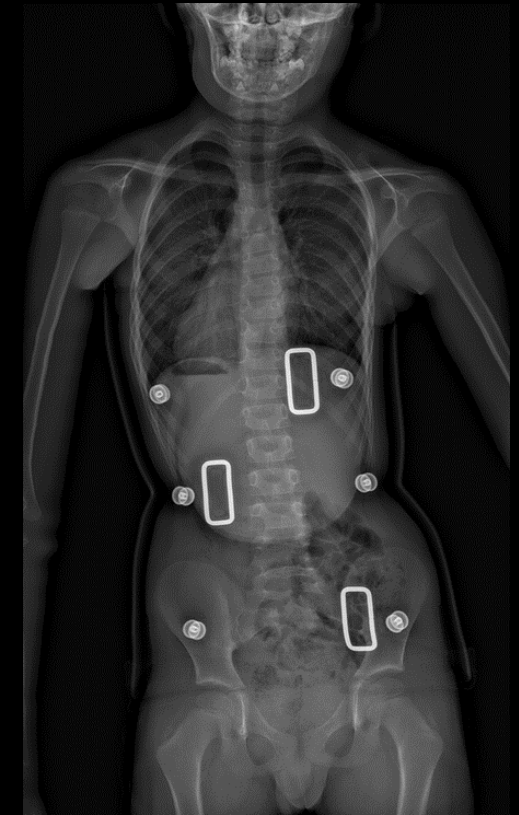
3+9 years, transition to EDF brace  
19° in brace



Sample of EDF  
brace – custom  
molded TLSO,  
same  
principles



Final follow-up:  
5 years old  
25° out of brace, 6° in  
brace



# Conclusions

- EDF casting is a safe option in children with Marfan's and Loeys-Dietz Syndromes
  - Skin complications did not occur in this small series
- Casting was not curative, but was palliative, in patients with EOS associated with CT disorders
- Casting delayed surgery in these patients and no child had more invasive surgery prior to age 7



Thank you

