The Outcomes of Mehta Casting for Non-Idiopathic Early Onset Scoliosis in a Large Multi-Center Cohort

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Background

- Serial Mehta body casting has been shown to improve and even cure 30%-70% of patients with infantile idiopathic scoliosis (Mehta 2005, Iorio 2017, Stasikelis 2018, Fedorak 2019)

- Baulesh JPO 2012
  - Delay in surgery for nonidiopathic scoliosis of 2 years with serial casting

- Demirkiran JPO 2015
  - Effective delay tactic in congenital scoliosis
    - "Long curves with multiple anomalous vertebrae"
  - Serial casting delayed surgical intervention 26.3 months

Purpose

- The purpose of this study was to evaluate the efficacy for Mehta body casting for non-idiopathic early onset scoliosis (NI-EOS)

Methods

- Multicenter retrospective review of all patients with non-idiopathic early onset scoliosis (NI-EOS) treated with Mehta body casting
  - Inclusion criteria:
    - Minimum coronal Cobb angle >20^0
    - Minimum two year follow-up ***after*** casting treatment completed
    - Timeframe: 2000-2016
  - **75 NI-EOS patients identified**
- Precast, first in-cast, first out of cast, and last follow-up spine radiographs reviewed

Results

- Mean age at initial cast: 3 years
  - <2 years: 40% (n=30)
  - 2-3 years: 24% (n=18)
  - 3-4 years: 15% (n=11)
  - >4 years: 21% (n=16)
- Patient Diagnosis
  - Syndromic: 68% (n=51)
  - Congenital: 17% (n=13)
  - Neuromuscular: 15% (n=11)

**No significant difference in precast age, BMI, or curve magnitude amongst the diagnoses

Results

Radiographic Data

	Pre-Cast	Latest Followup	P value
Age (mean)	2.9 years (range: 0.7-9)	9.8 years (range: 5-15)	
Followup (mean)		5.0 years (range: 2-11)	
Coronal Cobb (mean)	57° (range: 20^0-101^0)	45° (range: 4^0-110^0)	**>0.5**
% Cobb correction		9% (range: -98% to +93%)	**>0.5**
Rib Vertebral Angle Difference (RVAD)	32° (range: 0^0-118^0)	24° (range: 0^0-70^0)	**>0.5**

Results

Age at initial cast

Pre Cast age:	<2 years	2-3 years	3-4 years	>4 years	P value
Pre-Cast Cobb	59^0	49^0	52^0	63^0	>0.5
Pre-Cast BMI	15.8	16.3	15.0	15.2	**>0.5**
Pre-Cast RVAD	38^0	23^0	30^0	33^0	**>0.5**
Initial In-Cast Cobb	33^0	38^0	38^0	48^0	**>0.5**
Initial In-Cast RVAD	27^0	20^0	29^0	28^0	**>0.5**
Final Coronal Cobb	46^0	40^0	50^0	53^0	**>0.5**
Final % Correction	16%	7%	-14%	16%	**>0.5**

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Results at latest followup

- **“Cured”:** 9% (n=7)
  - curve<15^0 at latest followup
- **Improvement >20^0:** 15% (n=11)
- **Cobb >50^0:** 65% (n=49)
  - 33/49 (67%) required surgery (44% of cohort)
  - Surgery mean age of 7.5 years

Conclusion

- Mehta casting achieved limited success with curing or significantly improving non-idiopathic EOS
- Final Cobb >50^0 in 65%; 44% required surgery
- Age at initial cast not a factor in outcomes
- Casting in NI-EOS more of a delay tactic

Next Steps

- Currently further reviewing an even larger cohort of NI-EOS patients and their various diagnoses
- Goal to determine if specific etiologies have a better/worse response to serial casting
- Critical analysis of specific time points during treatment to better delineate the most effective duration of casting

Thank you!