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ORTHOPAEDIC SURGERY



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Radiographic Parameters Correlating with Success of Mehta Cast Utilization in Infantile Idiopathic Scoliosis

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DISCLOSURES

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- None





INTRODUCTION

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- Infantile scoliosis indicates curves presenting at 3ys of age or less
- Scoliotic deformities presenting before 5ys have been associated with a greater risk of cardiopulmonary complications and other comorbidities



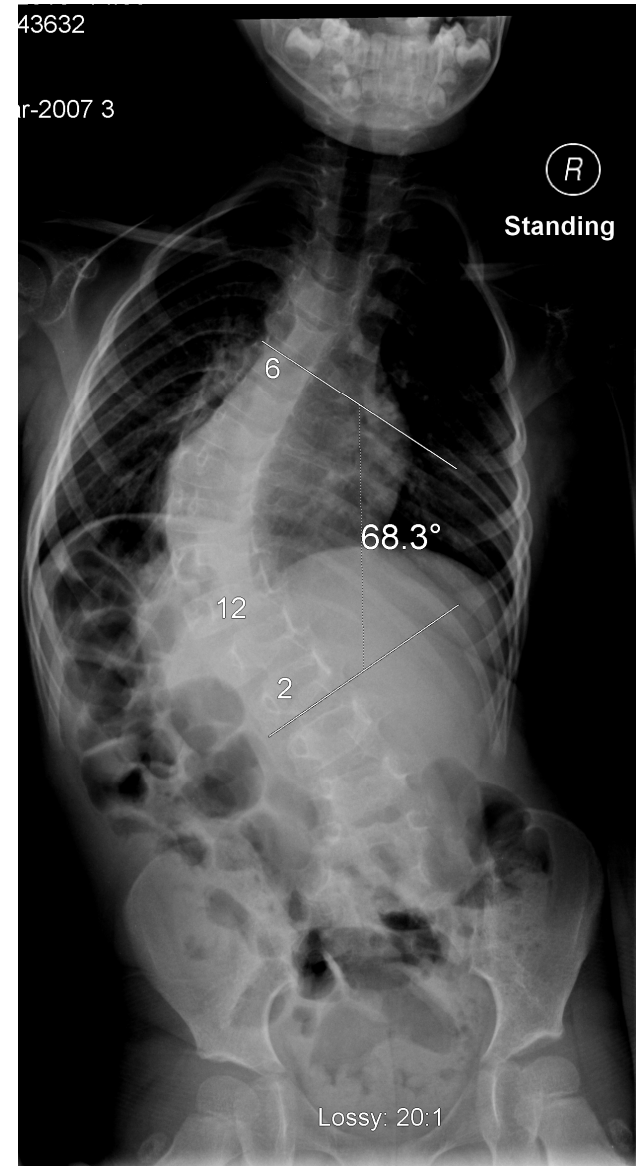


INTRODUCTION

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- **Treatment:**
 - **Non-operative**
 - **Mehta Casting**
 - **Operative**
 - **Growing Rod**
 - **VEPTR**

Mehta MH. J Bone Joint Surg Br 2005





GOALS

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Identify patient factors &
radiographic parameters
associated with sustained curve
correction in IIS patients that
undergo serial plaster casting





METHODS

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- Retrospective review of patients who underwent Mehta casting for IIS at a single institution by a single surgeon
- Consecutive series of 45 pts
- Patient Characteristics
- Complications
- Radiographic parameters

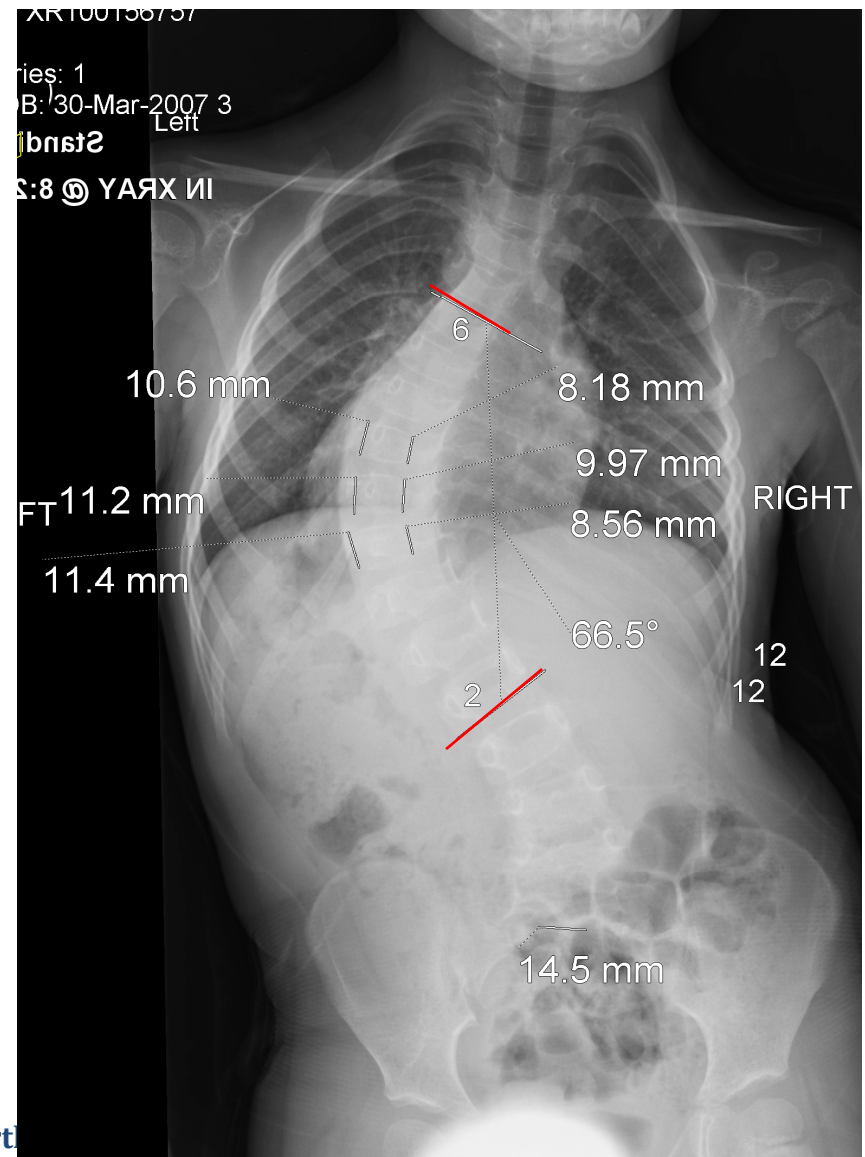




RADIOGRAPHIC PARAMETERS

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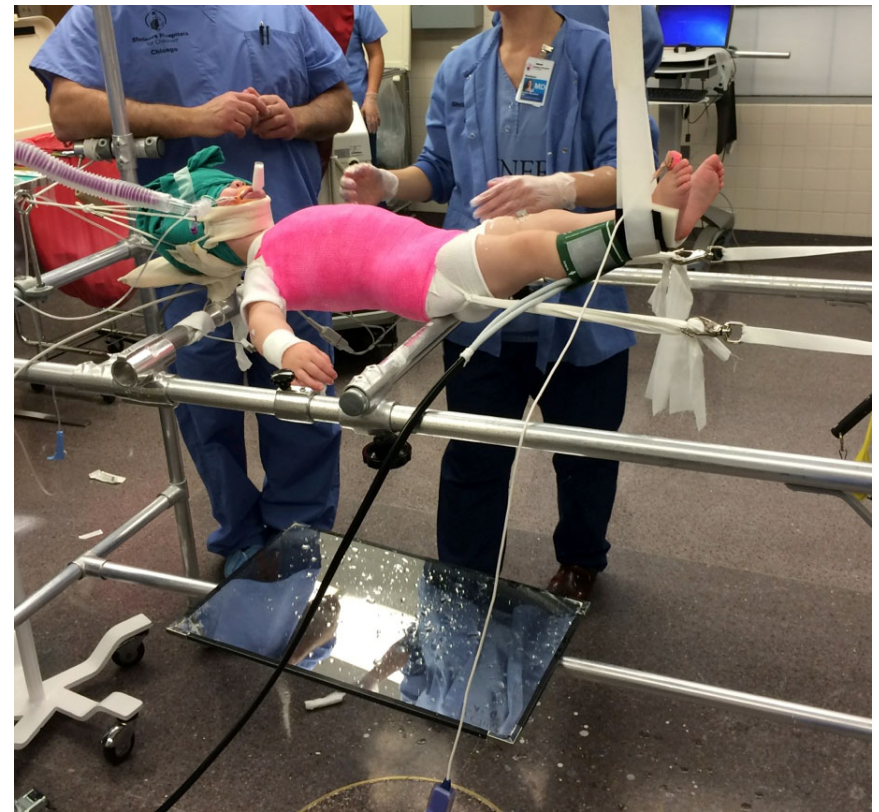
- Cobb angle of the coronal deformity
- Focal deformity
- Rib vertebral angle difference (RVAD)
- Height of the concavity & convexity of the apical 3 vertebrae
- Concave-to-convex height ratios





CASTING TECHNIQUE UNIVERSITY of VIRGINIA

- Derotational & translational forces on the deformity level
- The precise technique varied based on type & location of the curve
- Casts were changed routinely every few months





RESULTS

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Patient Characteristics

Male	18 (40%)
Female	27 (60%)
Mean Age at Start of Casting (mos)	18.8 (9.5)
Mean Age at Last Cast (mos)	35.9 (14.1)
Mean Age at Final Follow up (mos)	52.3 (23.7)
Mean Total Number Casts	7.6 (2.9)
Mean total Follow up (mos)	37.7 (19.7)





RESULTS

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Radiographic Parameters

	Pre-Cast	Last Cast	p-value
Curve Type			
Left	22 (49%)	23 (51%)	-
Right	23 (51%)	22 (49%)	
Mean CPL	1.5 cm	1.6 cm	0.69
Mean Curve Major	52.7°	25.6°	<0.001
Mean RVAD	32.3°	18.0°	<0.001
Mean Focal Deformity	30.5°	17.4°	<0.001

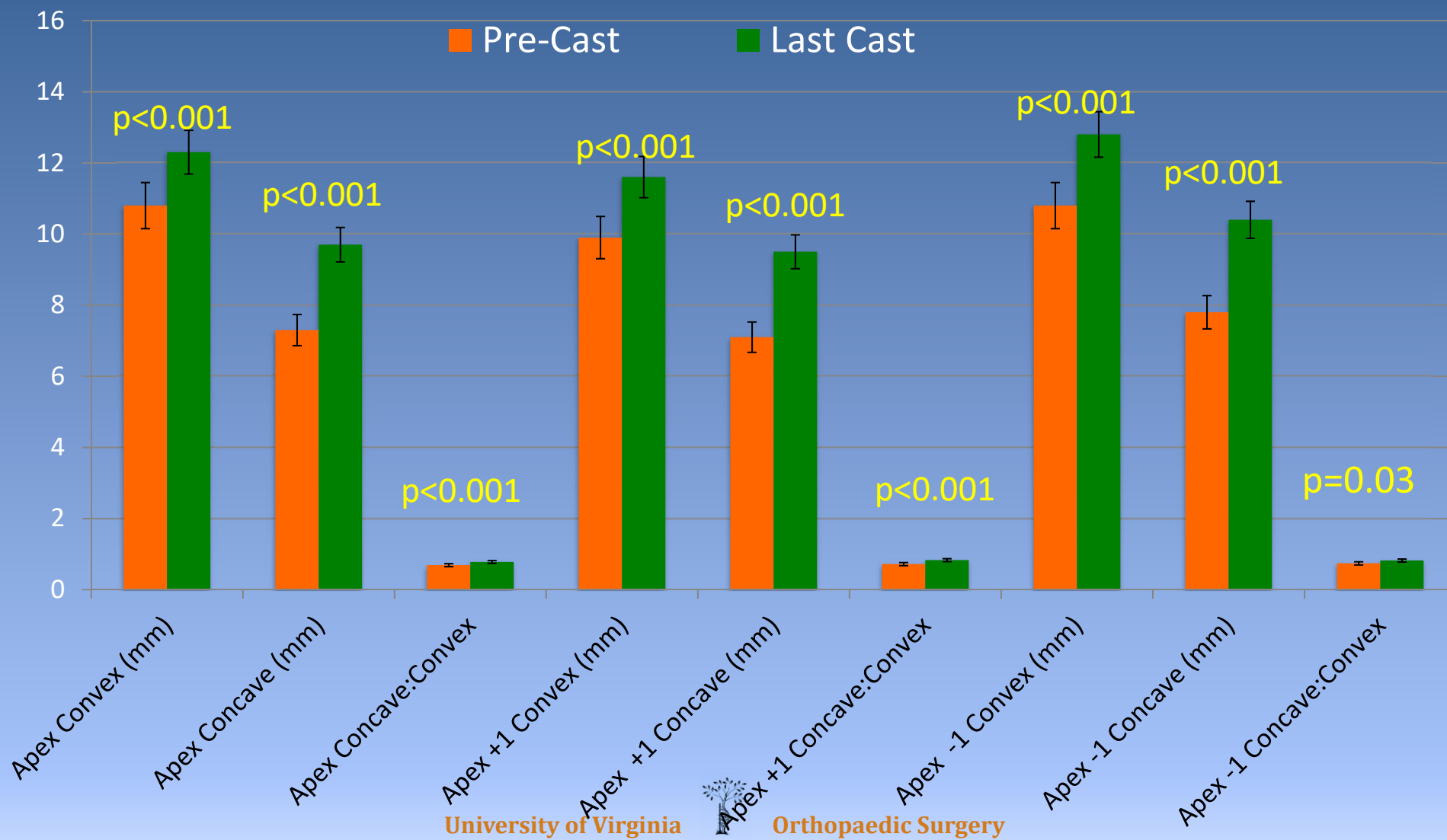




RESULTS

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Mean Vertebral Heights Pre-Cast to Last Cast





RESULTS

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Radiographic Parameters

	Last Cast	Final Follow-Up	p-value
Curve Type			
Left	23 (51%)	16 (35%)	-
Right	22 (49%)	22 (49%)	
Neutral	-	7 (16%)	
Mean CPL (cm)	1.62	1.63	0.98
Mean Curve Major	25.6°	16.2°	0.04
Mean RVAD	18.0°	14.1°	0.26
Mean Focal Deformity	17.4°	11.5°	0.06

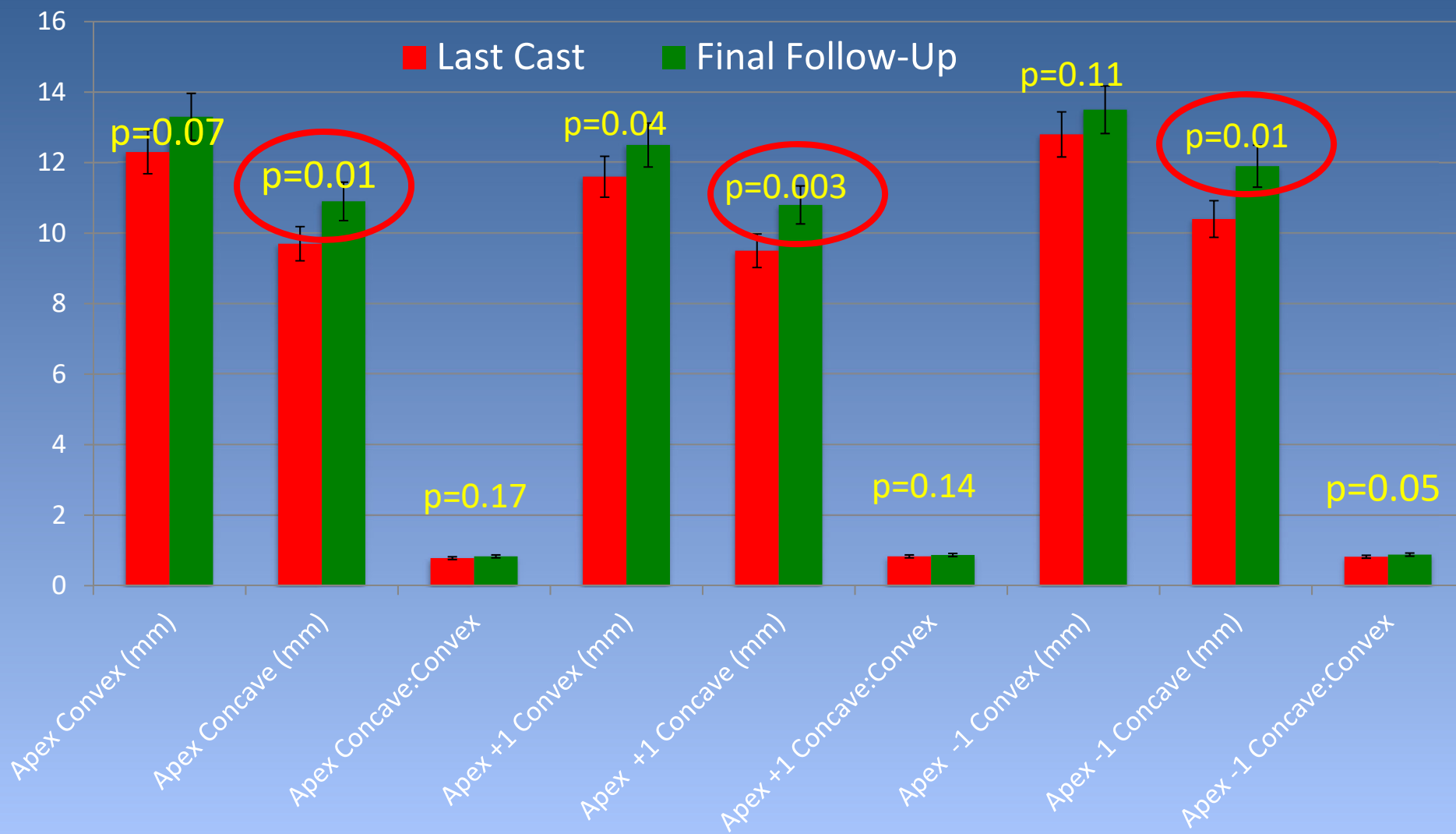




RESULTS

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Mean Vertebral Heights Last Cast to Final f/u





RESULTS

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*Factors Correlated with Sustained Curve Correction from Last Cast
to Final Follow-up*

	r	B-Statistic	p-value of B-Statistic
Rotation Correction from precast to last cast	0.71	0.02	0.79
Concave-to-Convex Ratio Improvement From precast to last cast			
Apex	0.72	0.04	0.69
+1 Apex	0.86	0.53	<0.001
-1 Apex	0.63	0.19	0.03
80% Cobb angle improvement from precast to last cast	0.28	0.04	0.38
Left Sided Curve	0.10	0.13	0.07
Focal Deformity Correction from precast to last cast	0.86	0.49	<0.001



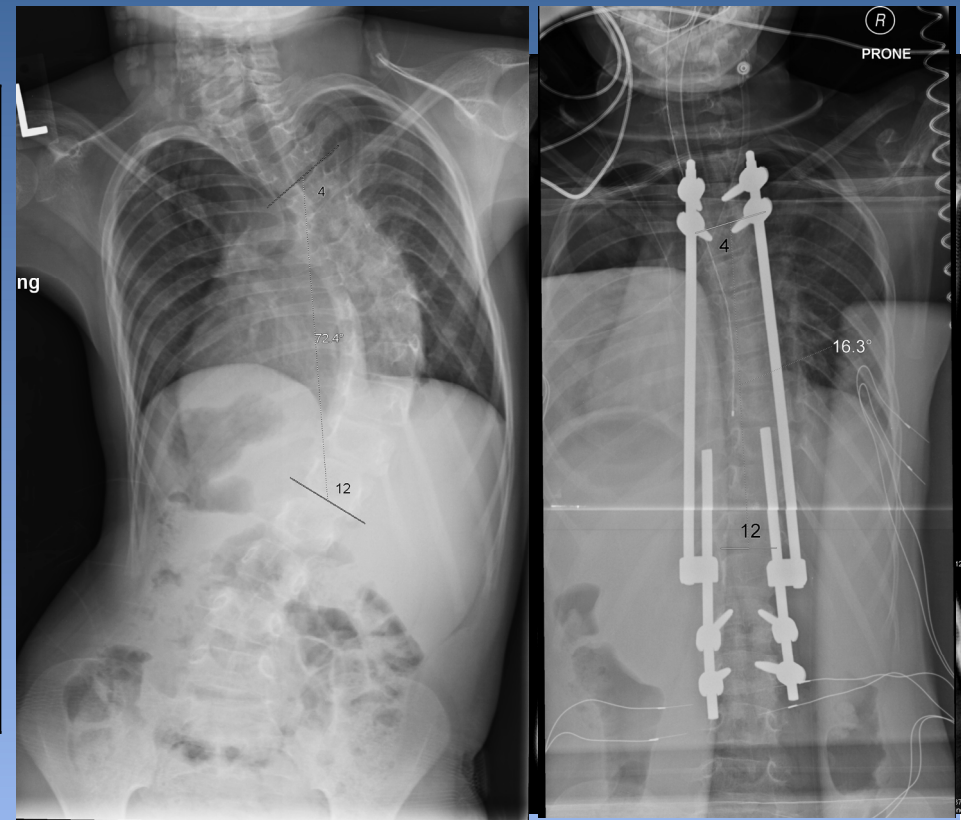


RESULTS

Complications

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None	28 (62%)
Skin Reaction	10 (22%)
Respiratory	3 (6%)
Nausea	2 (4%)
Progression of curvature	3 (6%)
Noncompliance	1 (2%)



4 patients were transitioned to surgery





DISCUSSION

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- IIS has potential for recovery & can be reversed when treated in its early stages
- Hüter-Volkman principle plays an integral role with Mehta casting
- With proper casting, growth can be channeled into a corrective mechanism





CONCLUSION

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- This study underscores the association of Mehta casting with significant curve correction
- Radiographic parameters associated with successful Mehta cast application:
 - improvements in focal deformity
 - concave-to-convex height ratios for +1 and -1 apical vertebrae after final casting.
- By delaying or sparing IIS patients from surgery & normalizing the spinal curvature, Mehta casting remains a viable treatment option for symptomatic IIS





THANK YOU

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Orthopaedic Surgery