Results of Hemivertebra Excision for the Treatment of Congenital Scoliosis: A Multicenter Retrospective Review

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# Financial Disclosures

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Michelle Marks   none

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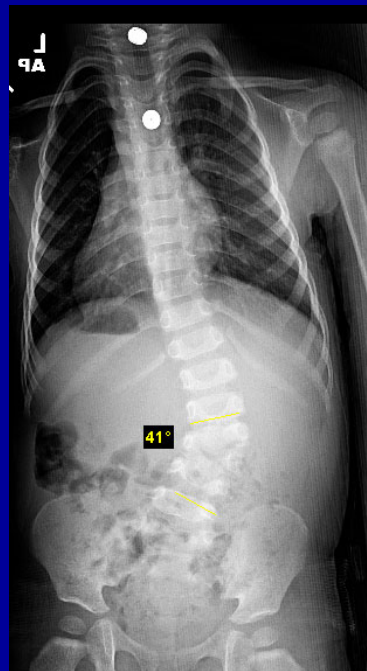UCSD

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Introduction

- **Congenital Scoliosis**
  - Progressive deformity
  - Hemivertebra – common

- **Surgical Options**
  - In-situ fusion
  - Hemi-epiphysiodesis
  - Instrumented correction
 - Hemivertebra excision
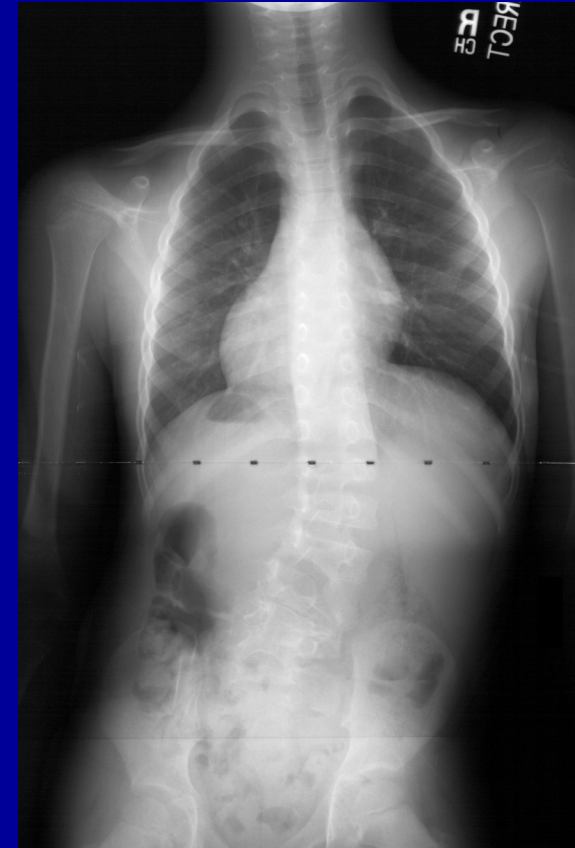
Purpose

- To evaluate the clinical and radiographic outcomes as well as complications following a hemivertebra (HV) excision.

Methods

- **Study design**
  - Retrospective
  - Multi-center

- **Inclusion Criteria**
  - 1 or 2 HV
  - Surgical excision
  - 2 year f/u
  - Less than or equal of 21 years of age

- **Clinical, radiographic, and Complication data recorded**

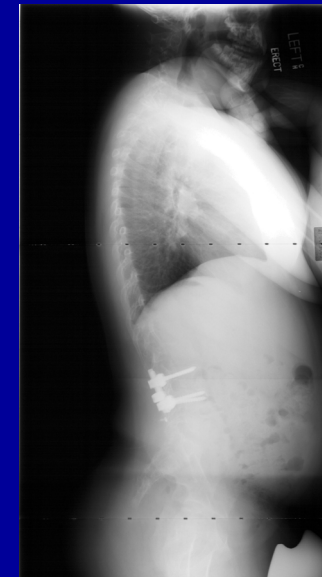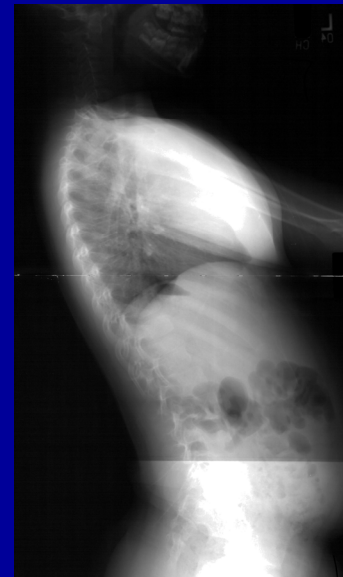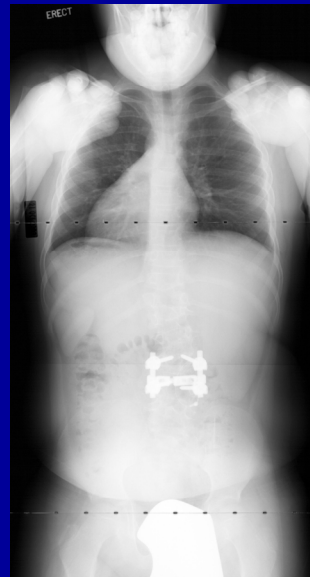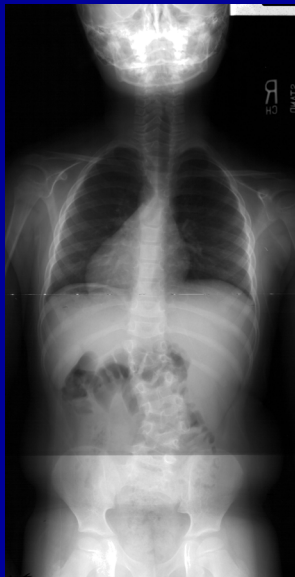- **Statistics**
  - ANOVA
  - Alpha p≤0.05
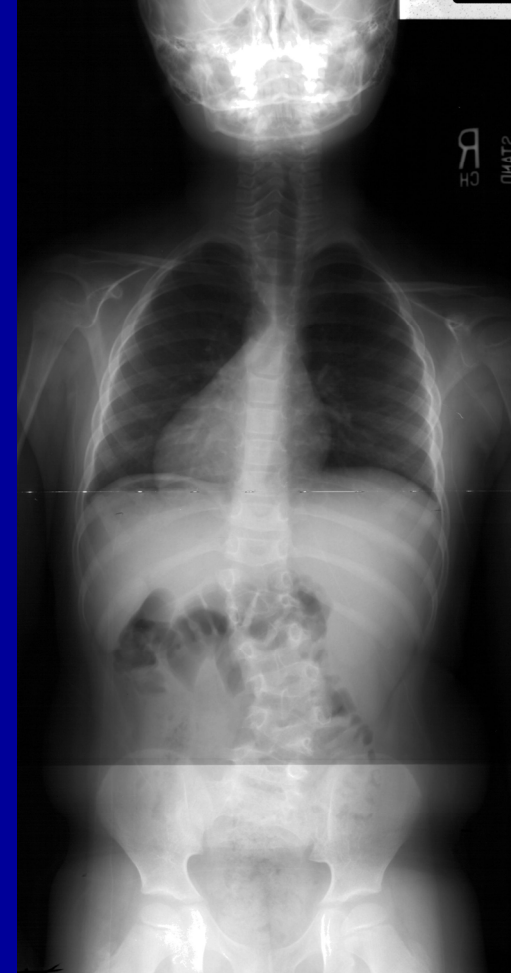
Clinical Results

- 42 patients (36 single HV, 6 double HV)

- Surgical Procedure
  - 33 posterior only vs. 9 anterior/posterior

Age (yrs)	5 ± 4
Fusion length (vertebra)	3 ± 2
EBL (cc)	455 ± 461
Operative time (min)	255 ± 89

Radiographic Results

	Pre-op (degrees)	Post-op (degrees)	% correction	
Coronal Cobb	35 ± 9	10 ± 10	73 ± 21	$p < 0.001$
Sagittal Cobb	18 ± 21	14 ± 22		$p = 0.274$

Clinical Results

- Complication rate: 38%

	Patients
Infection	3
Neurologic	5 (1 post-op seizure)
Instrumentation	5
Other	2 deformity progression, 1 pseudoarthrosis, 1 C. difficile colitis

Neurologic Complications

- 4/42 patients → 10% incidence

- 2 patients
  - bilateral dysesthesias
  - Resolved at 2 days and 2 weeks post-op

- 2 patients (L3 and L5 HV)
  - Ipsilateral nerve root motor deficit
  - Resolved at 2 weeks and 10 months post-op

Results

- Improved results with greater experience

	G3	Other sites	p value
N	17	25	
Coronal Correction	84±19%	50±25%	p<0.001
Fusion length	2 ± 1	5 ± 4	0.003
EBL (cc)	310 ± 232	602 ± 582	0.06
Operative time (min)	226 ± 48	282 ± 117	0.07
Complications	4 instrumentation, 1 other	2 infection, 4 neurologic, 1 instrumentation, 2 other	

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Discussion

- Average age – 5 yrs
  - Klemme et al. *J Pediatr Orthop* 2001 – 19 mo
  - Callahan et al. *J Pediatr Orthop* 1997 – 3 yrs 11 mo.

- High correction rate – 73%
  - Ruf and Harms *Spine* 2003 – 69%
  - Shono et al. *Spine* 2001 – 64%
  - Bollini et al. *JBJS Am* 2006 – 64%

Discussion

- Overall complication rate – 38%
  - Ruf and Harms *Spine* 2003 – 21%

- Neurologic complication rate – 10%
  - All motor deficits were ipsilateral nerve root → resolved
  - Holte et al. *JBJS Am* 1995 – 7/37 pts with temporary nerve root lesions

- Greater experience → improved radiographic results with decreased complication rates

Conclusion

- HV excision in young patients can provide significant scoliosis correction, thereby preventing a progressive deformity as well as the development of compensatory curve

- HV is not without risks

- There appears to be a learning curve associated with HV excisions

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