Treatment for Congenital Scoliosis due to Hemivertebrae: A Multicenter Retrospective Review.

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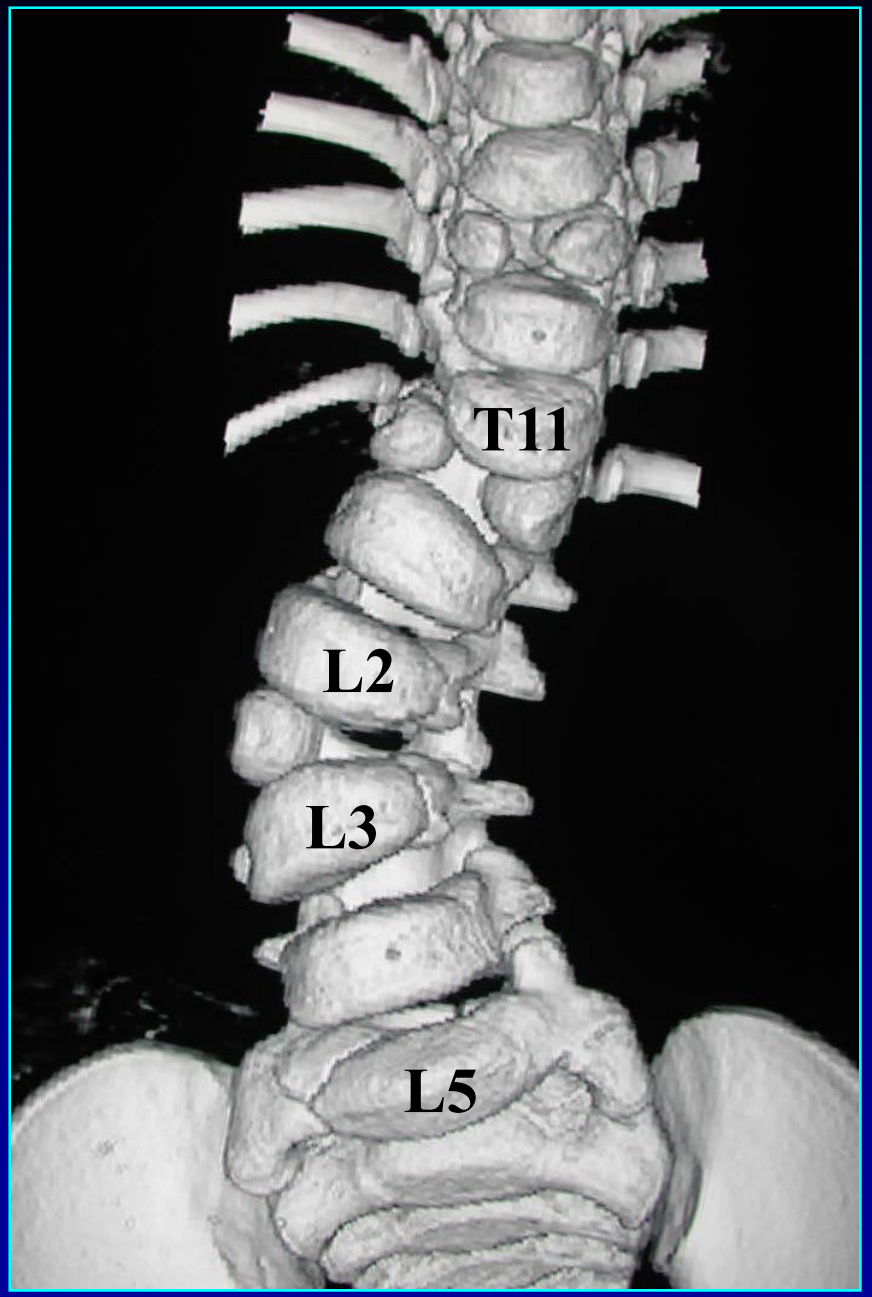
The Harms Study Group



Introduction

- Congenital spinal deformity may be expressed as a simple, focal abnormality or a complex, global deformity.

- It may include a diverse range of spinal anomalies including hemivetebrae (HV), bars, failures of segmentation and formation, scoliosis and kyphosis.

- Extra-spinal patho-anatomy may include fused ribs, cardiac, GI, renal and CNS pathology.

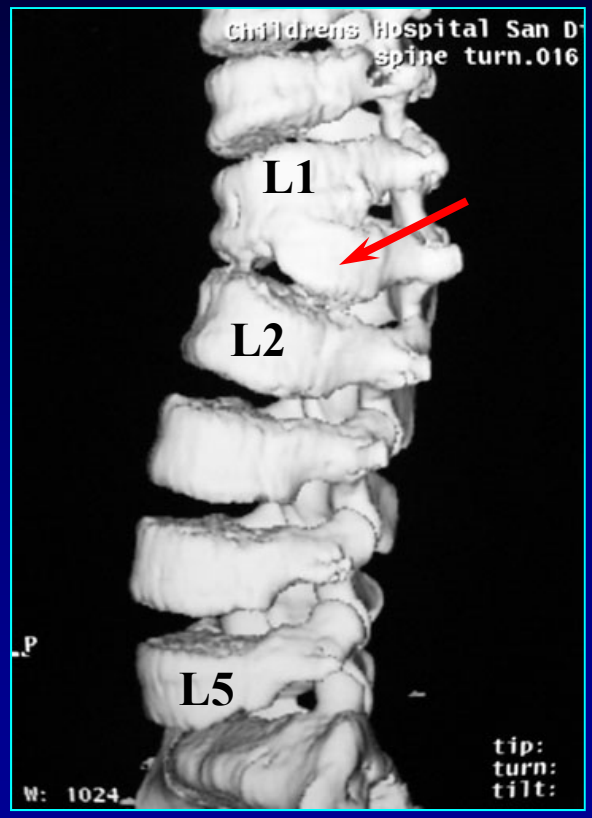
- The surgical techniques used to treat these patients runs the gamut from simple to complex.

- Techniques have evolved from in-situ posterior fusion without instrumentation to posterior vertebral column resections with instrumentation.

Purpose

- …to perform a multicenter review of patients with congenital scoliosis, who were treated surgically for hemivertebra causing spinal deformity and …

- …to evaluate the results of the surgical techniques used to treat the spinal deformity



Methods

- Retrospective review of patients from 8 centers with 1 or 2 level hemivertebrae

- All patients with more than 2 year follow up

Results

Three Surgical Groups were identified and evaluated :

Group I : Hemi-epiphys. or in-situ fusion w/o correction or PSI
(n=10, 24%)

Group II: PSF&I w Correction but w/o HV resection
(n=9, 21%)

Group III: PSF&I w Ant., Post., or combined HV resection
(n=23, 55%)

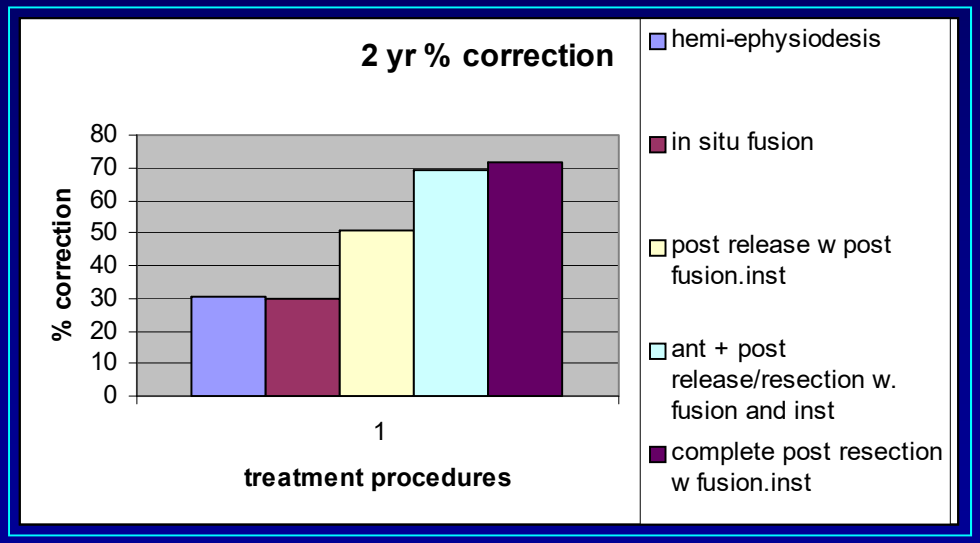
Results

- 42 patients with 2 year follow up
- Treated between 1991 and 2004
- Fully segmented, Non incarcerated HV n=32 (76%)
- Incarcerated HV n=1 (2.4%)
- Semi-segmented HV n=9 (21.4%)
- Mean Patient age was 8 (1-18)

Results

- Pre operative curves were significantly smaller in Group I (37°) and Group III (34°) compared to Group II (55°) $p=0.04$ and $p<0.01$

- % Post operative curve correction was better for Group III (74%) compared to Group I (30%) or Group II (45%) $p\leq0.01$



- Sub-analysis of Group III reveals shorter fusion in those patients treated with posterior resections $p=0.05$

Results

Complication Rates

- Group I : 20%, Group II : 11%, Group III : 35%

	N	Pre-op Curve Size	Age @ Surgery	# Level fused	Complications	EBL	Operative Time	2 yr % correct
Group 1: Fusion without Correction	10	37° ± 15°	11 ± 6	3 ± 5	1 infection 1 other	363 ± 329	223 ± 110	30 ± 12
Group 2: Correction without HV Resection	9	55° ± 19°	9 ± 5	7 ± 3	1 neurological	643 ± 449	286 ± 117	45 ± 18
Group 3: Correction with HV Resection.	23	34° ± 10°	6 ± 4	3 ± 3	1 infection 4 neurological 3 instr.	613 ± 767	281 ± 141	74 ± 21

Results

- EBL

		Mean	Std. Deviation	N
Group 1	in situ fusion	373	358	8
Group 2	post release w post fusion.inst	750	384	5
Group 3	ant + post release/resection w. fusion and inst	815	913	10
	complete post resection w fusion.inst	504	608	17

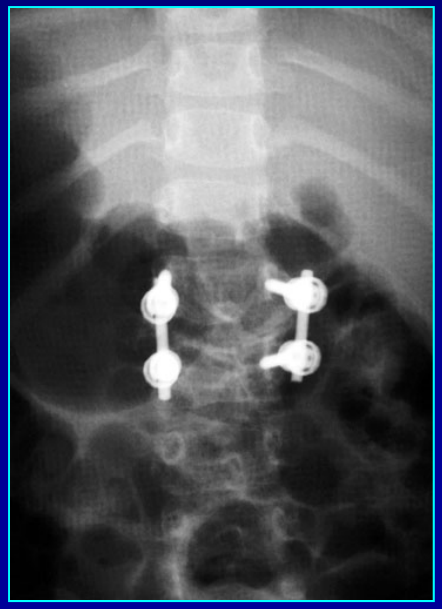
- Cell Saver

		Mean	Std. Deviation	N
Group 1	in situ fusion	881	1268	4
Group 2	post release w post fusion.inst	142	101	3
Group 3	ant + post release/resection w. fusion and inst	392	463	6
	complete post resection w fusion.inst	218	155	9

Conclusion

- HV resection results in best % correction
- HV resection has a slightly higher complication rate but in this study the HV resection group (Group 3) included pts. treated with Ant and Post procedures
- HV resection in younger patients results in better correction with fewer levels fused than the other two techniques






Conclusion

- Trends in treatment of isolated Hemivertebrae: Increasing number of patients with posterior HV resection, Operate at a younger age, Short fusion …1-2 interspaces, Decreasing EBL, Better correction, Better maintenance of correction at 2 years.

	N	Pre-op Curve	Age @ surgery	# Level fused	Complications	EBL	Operative Time	2 yr % correct
Group 1: Fusion w/o Correction	10	37° ± 15°	11 ± 6	3 ± 5	1 infection 1 other	363 ± 329	223 ± 110	30 ± 12
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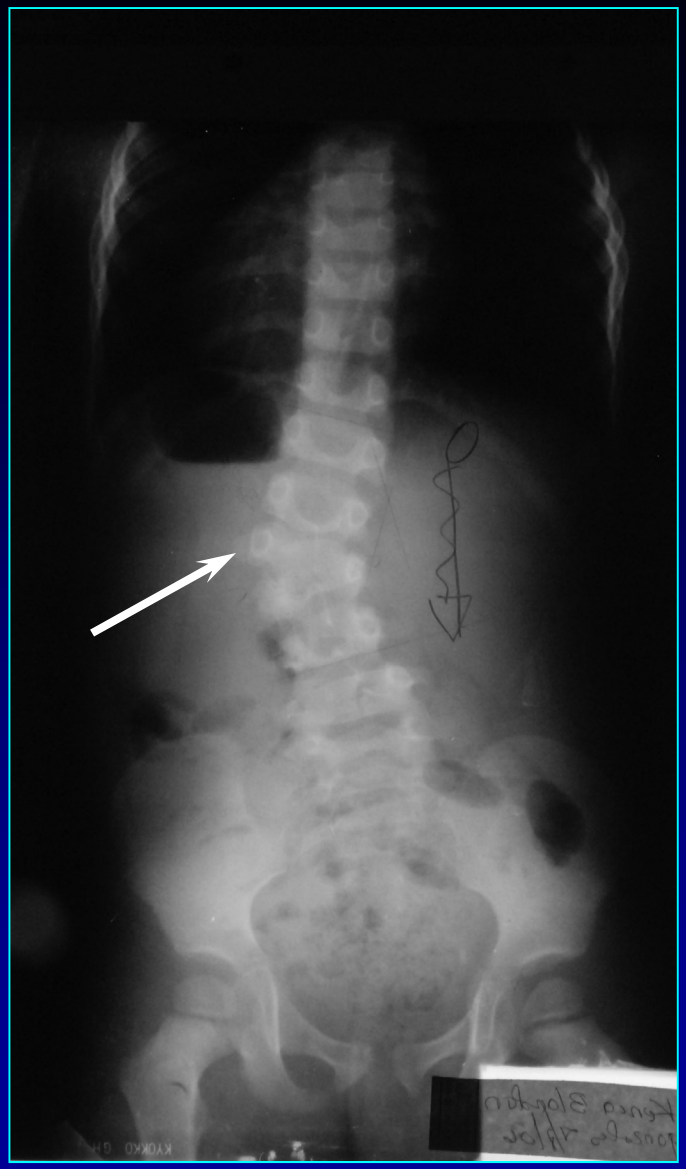
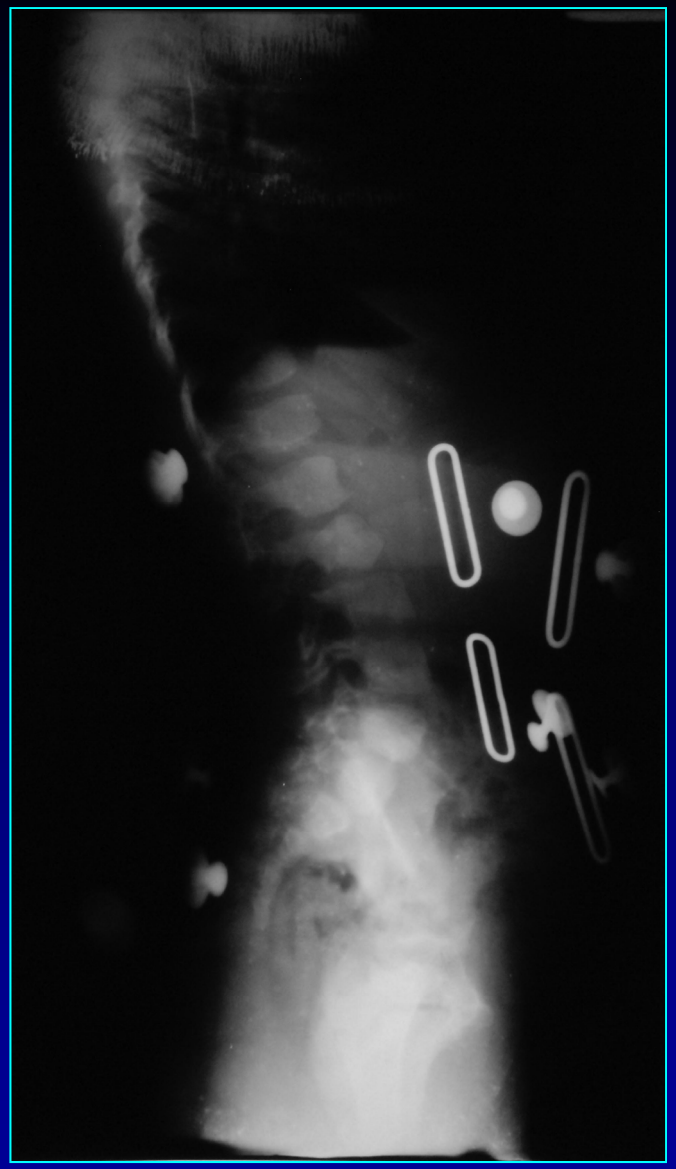
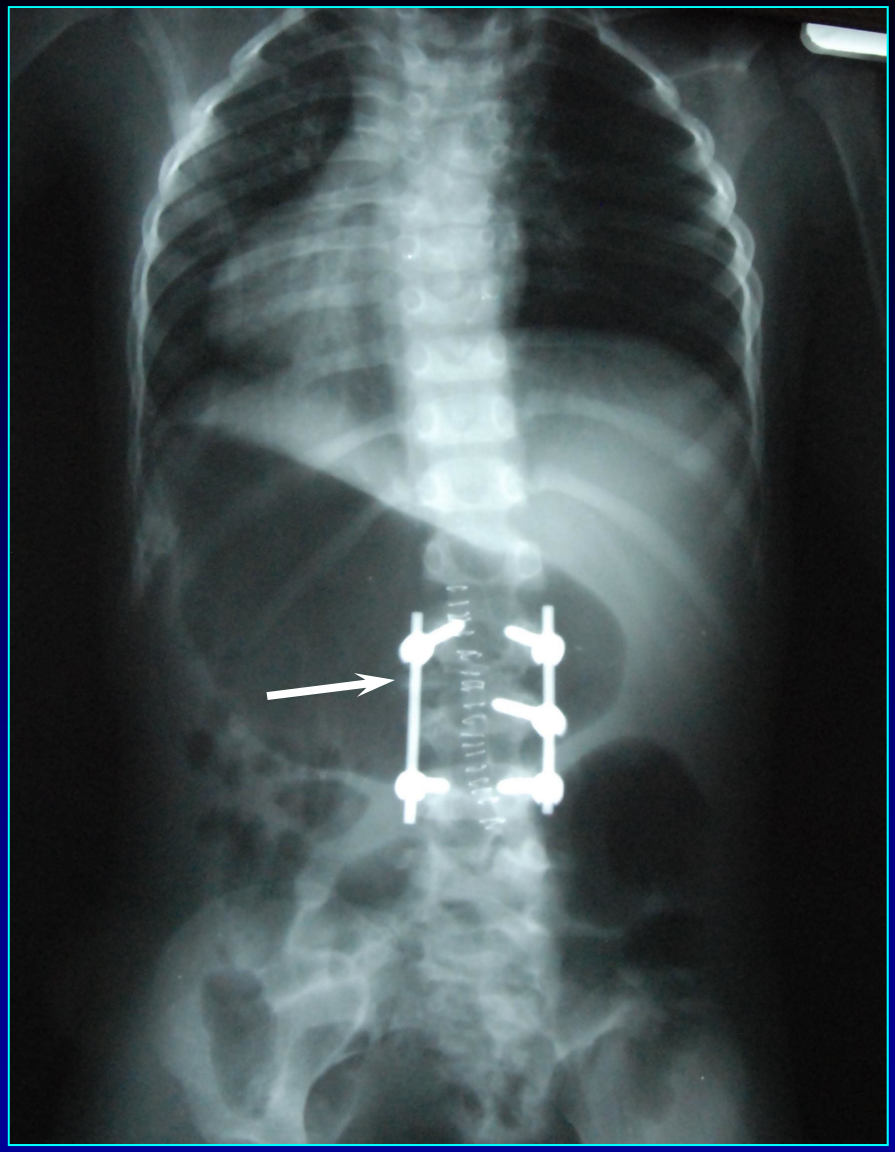




This is a 6 year male with an L2 hemi vertebrae who has “failed” brace treatment and hemi-epiphys. The curve has progressed.



The patient was treated with a posterior hemivertebra resection and a short instrumented fusion

…casting works when post-operative bracing is not available …..

Thank You