

kyphoscoliosis group with a %84 correction rate at final f/up. Normal sagittal alignment was restored and maintained (mean SVA:+4.2 mm) in all pts. There were no adding-on, crankshaft deformity, pseudoarthrosis, vascular or neurological complications. Comparison of preop/final CT scans, showed neurological increase for all vertebral body and spinal canal parameters and did not show any iatrogenic spinal canal stenosis or growth retardation.

Conclusions: Early surgical treatment of congenital scoliosis/kyphoscoliosis due to hemivertebra before the structural changes occur, provided and maintained satisfactory correction on both planes without developing adding-on, crankshaft deformity and iatrogenic spinal stenosis.

Table: Vertebral body and spinal canal parameter measurements

Measurements (mm)	UAV			UIV			LIV			LAV		
	Pre-op	F/up	p	Pre-op	F/up	p	Pre-op	F/up	p	Pre-op	F/up	p
APD	13.42	17.75	0.028	12.56	17.23	0.028	13.4	17.27	0.028	14.39	18.46	0.028
LD	22.07	26.43	0.028	22.8	28.08	0.028	23.39	28.63	0.028	23.59	30.59	0.028
RP width	4.32	5.66	0.012	3.22	6.01	0.015	5.81	8.65	0.012	7.1	8.67	0.009
LP width	4.73	6.07	0.011	5.4	6.05	0.058	6.32	5.67	0.012	7.78	9.17	0.012
RP length	30.75	35.25	0.012	29.28	32.9	0.012	30.75	34.4	0.012	32.06	35.2	0.012
LP length	31.12	35.01	0.012	29.81	33.37	0.012	30.78	34.62	0.012	31.92	35.8	0.012
RP height	7.4	9.35	0.012	6.8	8.25	0.012	6.41	8.17	0.012	8.37	10.5	0.012
LP height	7.2	9.27	0.012	6.98	8.45	0.012	6.42	8.35	0.012	8.22	9.85	0.012
SCA (mm ²)	235.1	287.3	0.012	238.4	288.5	0.012	262.7	308.9	0.012	263.2	302.4	0.012

LAV: Lower adjacent vertebra, LIV: Lower instrumented vertebra, LUI: Lower instrumented vertebra, LAV: Lower adjacent vertebra, APD: Antero-posterior diameter of vertebral body, LD: Lateral diameter of vertebral body, SCA: Spinal canal area, RP: Right pedicle, LP: Left pedicle.

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Paper #7

Efficiency and Reliability of Ilio Sacral Screws in Fusionless Surgery for Neuromuscular Scoliosis: Preliminary Results of 100 Patients



Lotfi Miladi, Gaume Mathilde, Nejib Khouri, Christophe Glorion

Summary: We reviewed radiographic data and complications of 100 cases of neuromuscular scoliosis operated with the same fusionless technique extended to the pelvis using ilio sacral screws. The results showed 61% correction of spinal deformities and 83% of pelvic obliquity with only 21% global complication rate. There were no neurologic complications, no rod breakage and no need for fusion conversion. Patient’s quality of life was improved by this technique as post-operative bracing was not used.

Hypothesis: An original technique to reduce complications rate of pelvic fixation in neuromuscular scoliosis.

Design: Retrospective review.

Introduction: The poor general status and the weakness of pelvic bone in neuromuscular patients predispose to mechanical complications. Various pelvic fixations are already described in the literature but the complication rate is high. We report the preliminary results of a strong and stable original method.

Methods: 100 patients with neuromuscular scoliosis underwent the same fusionless surgery extended to the pelvis. Age at surgery was 11+6y. Mean follow-up was 3+1y(1+6y to 5+1y). Diagnoses included 61 cerebral palsy, 22 spinal muscular atrophy, 10 muscular dystrophy and 7 other neurological etiologies. Cobb angle and pelvic obliquity were measured before initial surgery, and at final follow-up. Complications were reviewed. The technique relies on a bipolar bilateral sliding construct from T1 to the pelvis performed thought a minimally invasive approach. The proximal fixation is made on the first 5 thoracic vertebrae by 8 hooks in double claw configuration. The pelvic fixation uses ilio sacral screws on each side connected to the spinal rods by specific connectors. The rods system is composed of 2 pre curved telescopic rods on each side, bounded together by 2 dominos connectors and 3 cross links. Rod lengthening procedures have been performed in a mean interval of 1y+2. No post-operative bracing was needed.

Results: At last follow-up, mean Cobb angle improved from 88.66° to 34.88° which correspond to 60.66% correction. Mean pelvic obliquity

improved from 26.72° to 4.50° which correspond to 83.16% correction. Complications have occurred in 21 patients included 7 implants related events, 7 wounds dehiscence, 3 deep wound infections, 2 digestive and 2 pulmonary complications. 10 patients required unplanned surgery. There were no neurologic complications and no rod breakage.

Conclusions: This technique is safe and effective, providing a significant correction of spinal deformities and pelvic obliquity with a lower complications rate. It preserves spinal and thoracic growth and improves patient’s quality of life.

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Paper #8

Weight Gain After VEPTR Surgery may be From Nutritional Optimization Rather Than Improvement in Pulmonary Function



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Summary: Previous authors have concluded that an increase in weight percentile (WP) in children with thoracic insufficiency syndrome (TIS) after Vertical Expandable Prosthetic Titanium Rib (VEPTR) surgery represents improvement in nutritional status, possibly secondary to improved pulmonary function. In our study, we did not find a change in WP after VEPTR insertion. We did not find any correlation between WP and nutrition labs or pulmonary function. Weight gain after VEPTR surgery may instead be secondary to nutritional optimization in high-risk patients.

Hypothesis: VEPTR surgery does not result in a change in weight percentile (WP). WP does not correlate with pulmonary function.

Design: Prospective comparative study.

Introduction: Children with TIS often have failure to thrive (WP <[le]5). A previous study showed an increase in WP after VEPTR surgery. Weight gain was hypothesized to be secondary to improved pulmonary function. The purpose of our study was to evaluate whether (1) WP increases after VEPTR insertion, and (2) WP correlates with nutrition labs and pulmonary function.

Methods: We queried a prospective institutional VEPTR database to identify patients with a minimum follow-up of 2 years. Demographic data, nutrition labs, radiographic data, and pulmonary function tests (PFTs) were recorded.

Results: We analyzed 35 patients (21 males, 14 females) with congenital (27), neuromuscular (4), and syndromic/structural (4) scoliosis. Mean age at VEPTR insertion was 5.2 years. Average follow-up was 6.0 years. Mean preoperative weight was 17.1 kg and mean weight at final follow-up was 32.0 kg. Gastrostomy tube (G-tube) and WP data are shown in the Table. Although all children gained weight, the PREOP<[le]5 group was more likely to have an increase in WP (P = 0.014). Ninety-four percent of the children with a decrease in WP were in the PREOP> 5 group. Overall, there was no change in the number of patients with a WP <[le]5. A larger percentage of children who maintained or increased their WP had a G-tube (42% vs 19%) but this was not significant. Eleven patients (73%) who had failure to thrive at final follow-up did not have a G-tube. We noted a positive correlation between change in WP and change in the space-available-for-lung ratio at 6 months postoperatively (P = 0.02). No other correlations were found between WP and nutrition labs, radiographic measures, or PFTs.

Conclusions: We did not find a change in WP after VEPTR insertion. We did not find a persistent correlation between WP and nutrition labs or pulmonary function. Weight gain after VEPTR surgery may be secondary to nutritional

Preoperative WP	Patients	N (%)					
		G-tube		Change in WP at final follow-up			WP <5 at final follow-up
		Placed prior to VEPTR	Placed after VEPTR	None	Increased	Decreased	
PREOP<5	13 (37)	3 (23)	4 (31)	5 (38)	7 (54)	1 (8)	8 (62)
PREOP>5	22 (63)	4 (18)	0	3 (14)	4 (18)	15 (68)	7 (32)
Total	35	7 (20)	4 (11)	8 (23)	11 (31)	16 (46)	15 (43)