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Weight Gain After VEPTR Surgery May Be From Nutritional Optimization Rather Than Improvement in Pulmonary Function

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Disclosures

- My co-authors and I have nothing to disclose.

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Background

- Children with thoracic insufficiency syndrome (TIS) often have failure to thrive (weight percentile [WP] ≤5)

- A previous study showed an increase in WP in children with TIS after VEPTR surgery
  - ↑ in WP = improvement in nutritional status
  - Secondary to improved pulmonary function?

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Purpose

1) Evaluate whether WP increases after VEPTR insertion

2) Assess whether WP correlates with nutrition labs and pulmonary function

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Methods

- Prospective comparative study
- Institutional VEPTR database
- Minimum 2 year follow-up
- Exclusion criteria:
  - Missing pre- and postoperative weight data
- Demographic data, nutrition labs, radiographic data, and pulmonary function tests (PFTs) were recorded

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Results

- 35 patients (21M, 14F)
- Diagnoses:
  - Congenital (27), neuromuscular (4), syndromic/structural scoliosis (4)
- Mean age at VEPTR insertion: 5.2±3.3 yrs
- Average follow-up: 6.0±2.1 yrs
- Mean preoperative weight: 17.1±7.8 kg
  - 13 patients (37%) had WP ≤5
  - 22 patients (63%) had WP >5
- Mean weight at last follow-up: 32.0±13.3 kg
  - All children gained weight

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Results

- PREOP≤5 more likely to have an increase in WP (*P*=0.014)
- 94% with a decrease in WP in PREOP>5
- Overall, no change in number of patients with a WP ≤5

	N (%)						
		G-tube		Change in WP at final follow-up			
Preoperative WP	Patients	Placed prior to VEPTR	Placed after VEPTR	None	Increased	Decreased	WP ≤5 at final follow-up
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)**

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Results

- Larger percentage of children who maintained or increased their WP had a G-tube (42% vs 19%) (NS)
- 11 patients (73%) who had failure to thrive at final follow-up did not have a G-tube

	N (%)						
		G-tube		Change in WP at final follow-up			
Preoperative WP	Patients	Placed prior to VEPTR	Placed after VEPTR	None	Increased	Decreased	WP ≤5 at final follow-up
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Results

- Nutrition labs:
  - Albumin, prealbumin, hematocrit, total lymphocyte count

- Trend towards a positive correlation between preoperative WP and preoperative prealbumin (*P*=0.084)

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Results

- Radiographic measures:
  - Cobb angle, T1-T12 length, T1-S1 length, space available for lung ratio

- Trend towards a positive correlation between change in WP and change in Cobb angle at final follow-up (*P*=0.054)

Mean Cobb Angle (degrees)		
Preoperative	Postoperative	Final follow-up
52 ± 24	43 ± 22	47 ± 25

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Results

- 22 patients with pre- and postoperative CT lung volume data
  - No correlations between WP and CT lung volumes
- 11 patients had pre- and postoperative PFT data
  - No correlations between WP and PFT data

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Discussion

- First study to evaluate:
  - Whether change in WP after VEPTR correlates with nutrition labs and pulmonary function
  - If presence of G-tube has effect on WP after VEPTR

- No overall change in WP after VEPTR
  - 92% of children who had failure to thrive preoperatively maintained or increased their WP
    - Presence of G-tube?
  - 68% of normal-weight children had a decrease in WP
    - None had a G-tube inserted postoperatively

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Limitations

- Small sample size
- Not all patients had complete pre- and postoperative nutrition labs, CT lung volumes, and PFT data
- No preoperative protocol for nutritional optimization
- Comorbidities or conditions requiring surgery outside of VEPTR treatment may have a negative impact on nutritional status

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Conclusion

- No change in WP after VEPTR insertion
- No correlation between WP and nutrition labs or pulmonary function
- Weight gain after VEPTR surgery may be secondary to nutritional optimization in high-risk patients and should be further studied
- Children who do not have failure to thrive at presentation also require attention

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