Pulmonary And Radiographic Outcomes Of VEPTR Treatment In Early Onset Scoliosis

Ozgur Dede, Etsuro K Motoyama, Charles Yang, Rebecca Mutich, Austin Bowles, Vincent F Deeney
Introduction

• The pulmonary effects of VEPTR expansion thoracoplasty is not clear
Materials and Methods

• Twenty-one patients
  – VEPTR expansion thoracoplasty treatment between 2002 – 2012
  – complete pre-operative and follow up PFTs and radiographs
Materials and Methods

Pulmonary Function Tests

- Immediately before index surgery and all subsequent expansions
  - Under general anesthesia

**Results**

**Patients**

- 10 male; 11 female
  - Congenital: 8
  - Syndromic: 9
  - Neuromuscular: 3
  - Idiopathic: 1

- Age at index: 58 months (24 – 131)
- Follow-up: 72 months (38 – 103)
- Expansions/patient: 11
- Pulmonary tests/patient: 10
- Interval: 6.4 months
Results

**Radiographs - Deformity**

- **Coronal Cobb Angle**
  - Initial: $80^\circ$
  - Final $67^\circ$ ($p=0.002$)

- **Maximum Thoracic Kyphosis**
  - Initial: $57^\circ$
  - Final $66^\circ$ ($p=0.08$)
  - Severe proximal thoracic kyphosis in 4
  - Coronal and/or sagittal off-balance in 7
Results

Radiographs - Spine Growth

- T1-T12: 18 mm height gain – 2.9 mm/year
  1st expansion to the last - excluding the initial length gain
- SAL (Space Available for the Lung) increased 77% to 87% (p = 0.006)
Results

Pulmonary – Forced Vital Capacity

• Pre-op: 0.65L
• Last FU: 0.96 L (P<0.001)

FVC increased throughout the treatment
Results

Pulmonary – % predicted FVC

• Pre-op : 77%
• Last FU: 58% (p<0.0001)

Based on arm span - did not keep pace with growth
Results

Pulmonary – Respiratory System Compliance

- Pre-op: 1.4 L/kg
- Last FU: 0.86 L/kg (p=0.0006)

38% decrease
Results

Pulmonary Function Indices

• No difference
  – congenital vs syndromic
  – thoracotomy vs no thoracotomy

• No correlation with
  – Cobb angle
  – SAL
  – age at index surgery
Summary

• **Pros**
  – Coronal correction maintained
  – FVC increased gradually

• **Cons**
  – Proximal thoracic kyphosis increased mildly
  – % pred FVC decreased
  – Respiratory system compliance decreased– chest wall became stiffer
Conclusions

• Our data does not provide convincing evidence on the beneficial effects of VEPTR on pulmonary function
• More careful/limited patient selection may improve outcomes
Thank You