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Pulmonary And Radiographic Outcomes Of VEPTR Treatment In Early Onset Scoliosis

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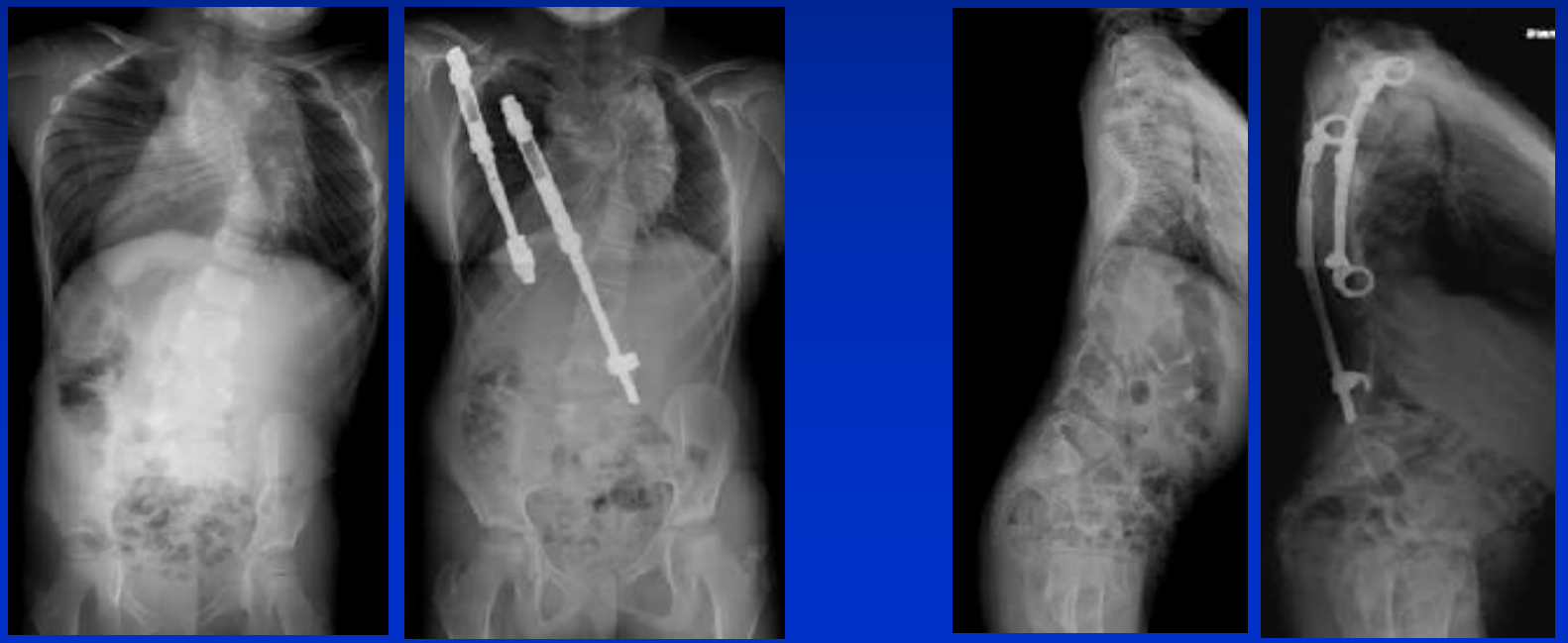
Introduction

- The pulmonary effects of VEPTR expansion thoracoplasty is not clear



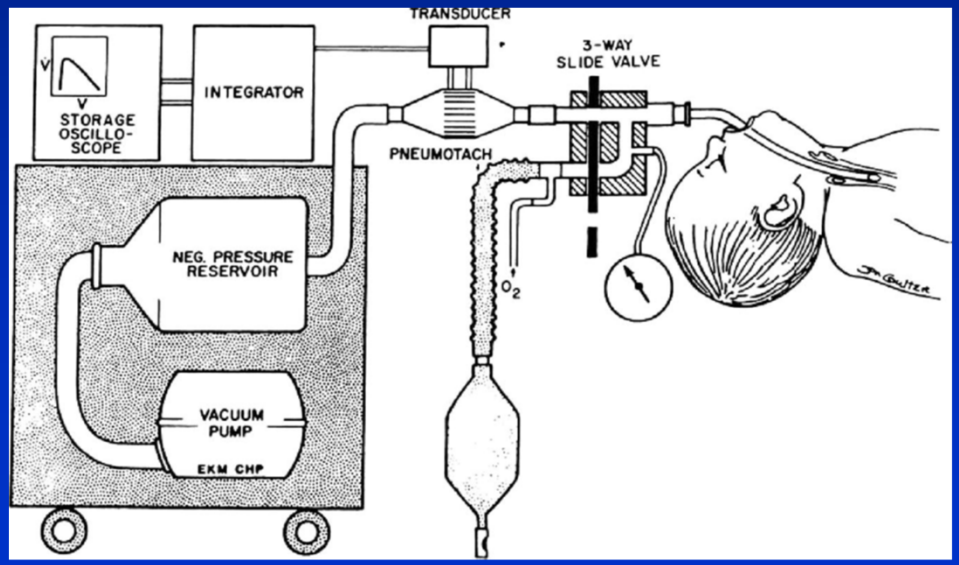
Materials and Methods

- 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**



Motoyama et al. Am Rev Respir Dis. 1987

Results

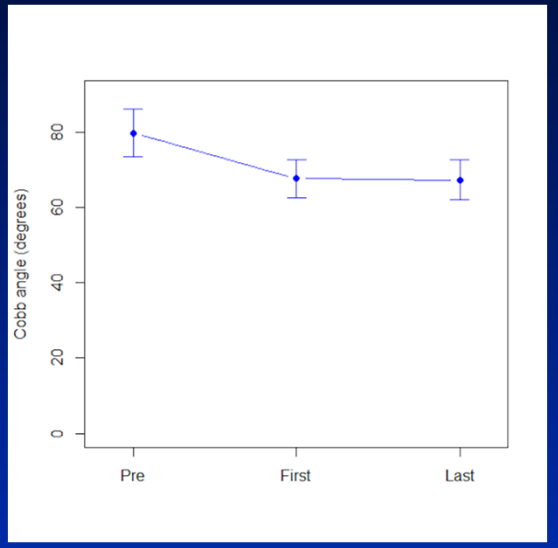
Patients

- 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

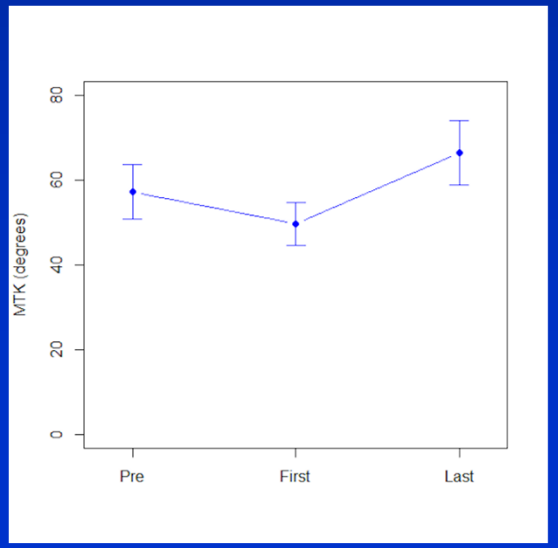
Results

Radiographs - Deformity

- **Coronal Cobb Angle**
  - **Initial: 80°**
  - **Final 67° (p= 0.002)**



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



Results

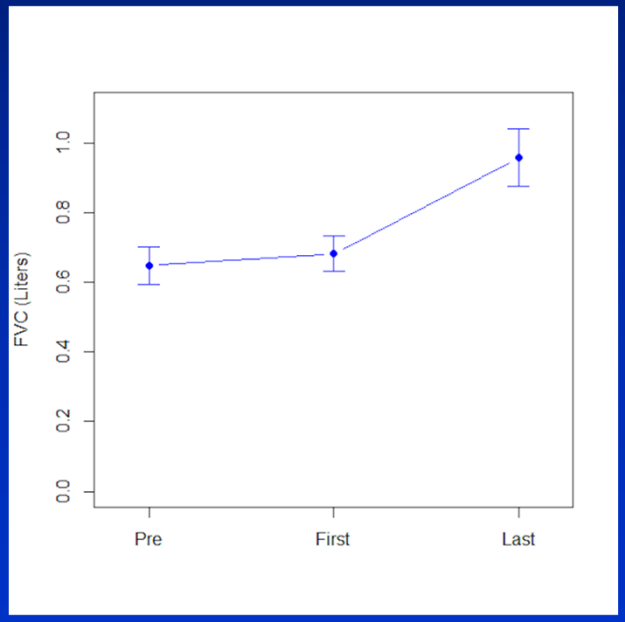
Radiographs - Spine Growth

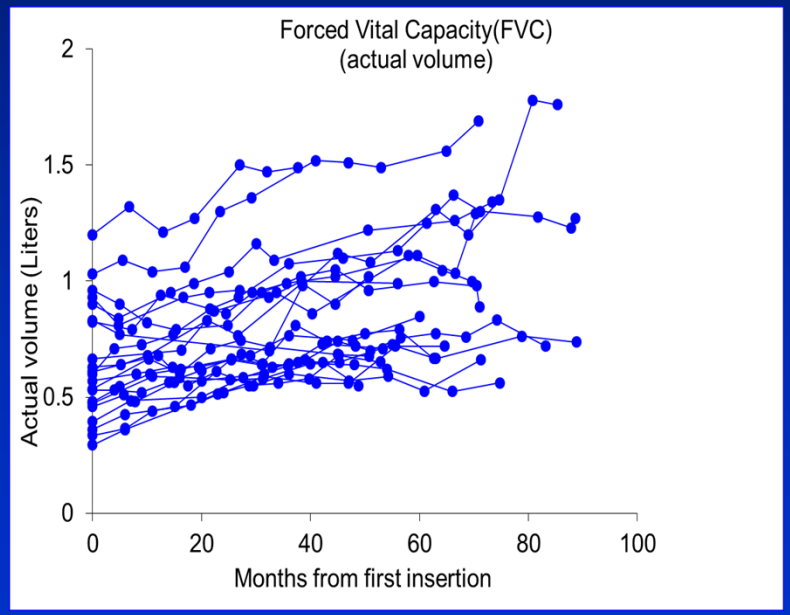
- **T1-T12 : 18 mm height gain – 2.9 mm/year**
  1st expansion to the last - excluding the initial length gain
- **SAL (Space Available for the Lung) increased 77% to 87 % (p = 0.006)**

Results

Pulmonary – Forced Vital Capacity

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



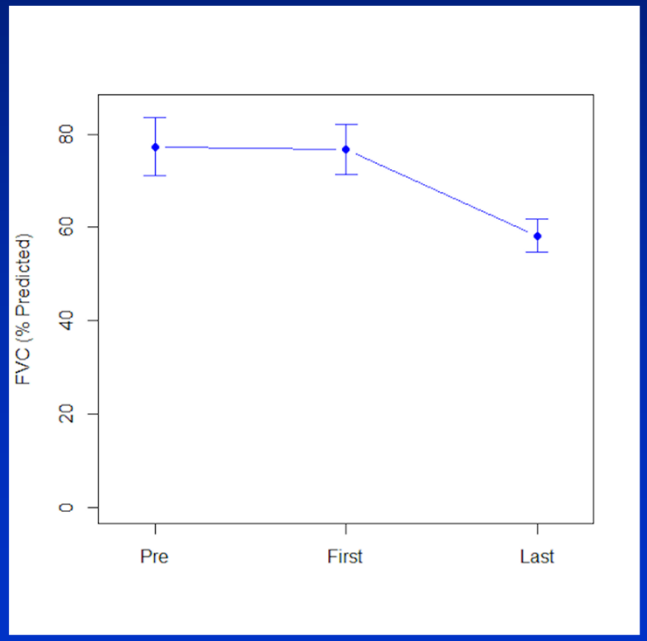


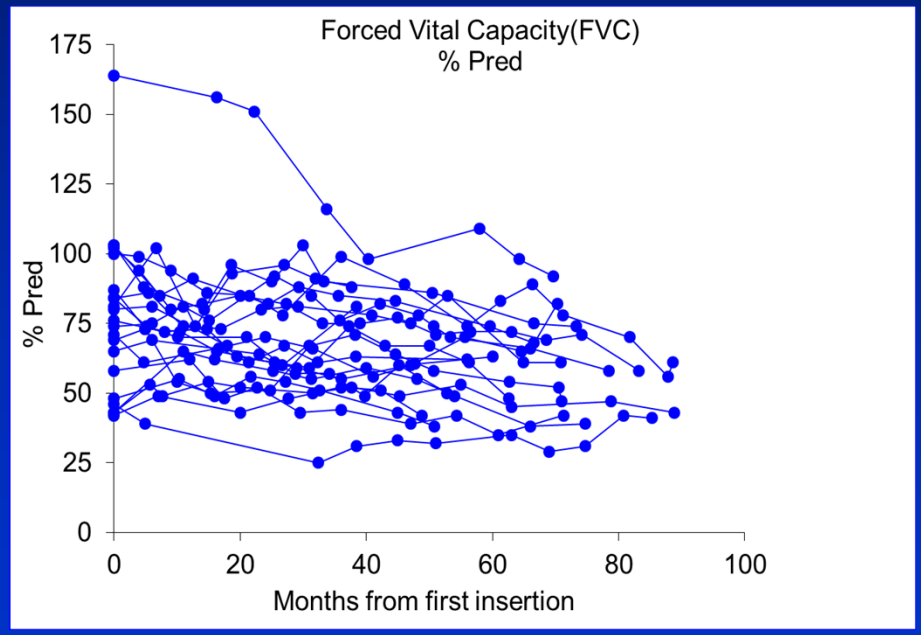
FVC increased throughout the treatment

Results

Pulmonary – % predicted FVC

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



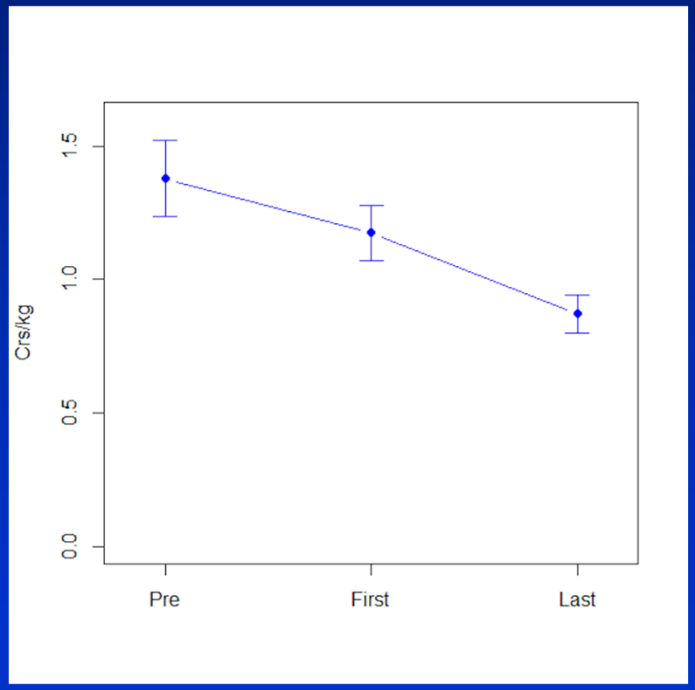


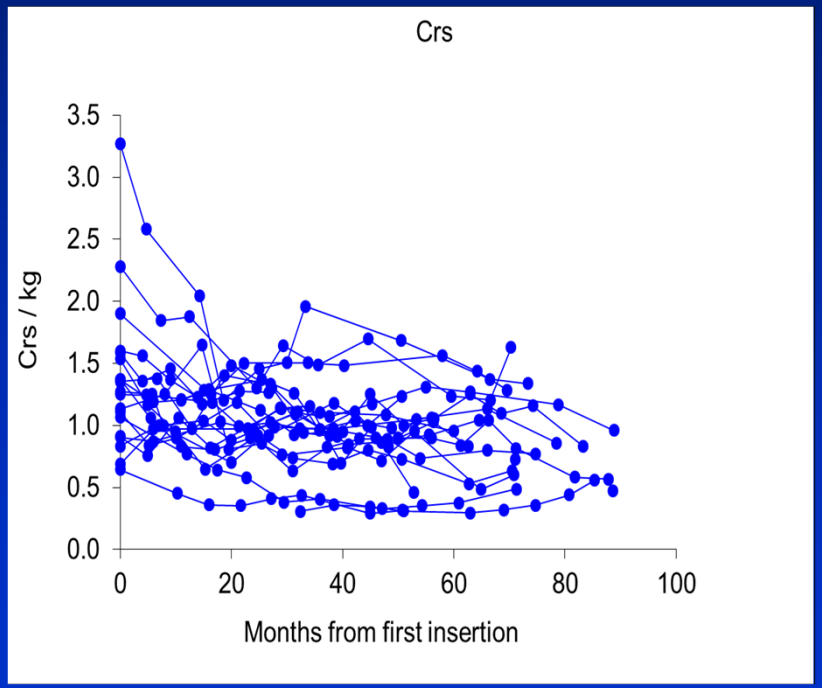
Based on arm span -
did not keep pace with growth

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

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