Master’s Technique: Vertebral Bar Excision

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Disclosure

• Consulting Fees: DePuy Synthes, Medacta

• Royalty: DePuy Synthes
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8th International Congress on Early Onset Scoliosis and Growing Spine (ICEOS)
November 20-21, 2014
Warsaw, Poland

EXCISION IS A SHORTENING
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Master’s Technique: Open Wedge Osteotomy

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Introduction

• Spinal deformity at an early age (EOS) will have a significant impact on
  • spinal growth
  • thoracic volume
  • cardiopulmonary development
Up to date treatment in growing spine

• Nonoperative EOS
  • Casting
  • Bracing
  • Observation

• Operative EOS
  • Distraction based
    • Growing rod (internal or external)
    • VEPTR
    • Magec & Phenix
  • Guided Growth
    • Luque trolley
    • Shilla
  • Compression Based
    • Staples
    • Tether /Screws/Bands/

Vertebral column lengthening with open wedge osteotomy in congenital bars
Introduction

• Congenital spinal deformity
  • Unsegmented bar – no growth
Introduction

• Congenital spinal deformity
  • Unsegmented bar – no growth
  • Contralateral side – growing
Introduction

• Treat the deformed region
  • Resection and compression – shortening
Introduction

• Treat the deformed region
  • Resection and compression – shortening
  • Osteotomy and distraction – normalising length
Background - Feasible?

- Bar is located laterally and posteriorly
- Anterior column is often hypoplastic
  - Osteotomy anteriorly from a posterior approach
  - Open the wedge between stable bony structures
- No nerves or vessels in the bar region
  - This allows the surgeon to perform an osteotomy in a safe zone
Surgical technique

- posterior approach
- concave side exposure and osteotomy of the bar to the anterior aspect
- careful periosteal preparation of surgical site to avoid unwanted fusion (scalpel and bipolar forceps!)
- opening up of the osteotomized segment to correct the curve by distraction under continuous intraoperative multimodal monitoring (MIOM)
- stabilization without fusion on one side using only pedicle screws, rod
Vertebral column lengthening with open wedge osteotomy in congenital bars.
Immediate correction

Vertebral column lengthening with open wedge osteotomy in congenital bars
Case 1

Vertebral column lengthening with open wedge osteotomy in congenital bars

Surgery earlier!
Reversal of progression

Correction was done in a single session!

Vertebral column lengthening with open wedge osteotomy in congenital bars

5 yrs

6 yrs

6 ½ yrs

+ Bracing
Patient population

– Inclusion criteria
  – Children with congenital deformity with unsegmented bar and contralateral single or multiple hemivertebrae
  – No signs of spinal cord compromise preoperatively
  – Documented (or high likelihood of) progression

– 8 consecutive patients 1997-2014
– Age 2.5 – 5.5 years (avg 4.4)
– F/U: up to 17 years (avg 7.5)
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<th>N° of distract</th>
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<td>M</td>
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Vertebral column lengthening with open wedge osteotomy in congenital bars.
Summary

• Spinal opening-wedge osteotomy is effective in congenital scoliosis

• The surgery should be performed as early as possible, so that all the intact spinal regions can grow normally. **Timing! Prevention!**

• Osteotomy is performed at the most affected region of the spine (@congenitally fused section)

• Goal of surgery is to achieve the greatest correction possible at this site

• Careful periosteal preparation to avoid unwanted fusion (growing rod)

• The use of intraoperative spinal cord monitoring is essential
Thank you