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

Master's Technique: Vertebral Bar Excision

Dezső J. Jeszenszky MD. PhD

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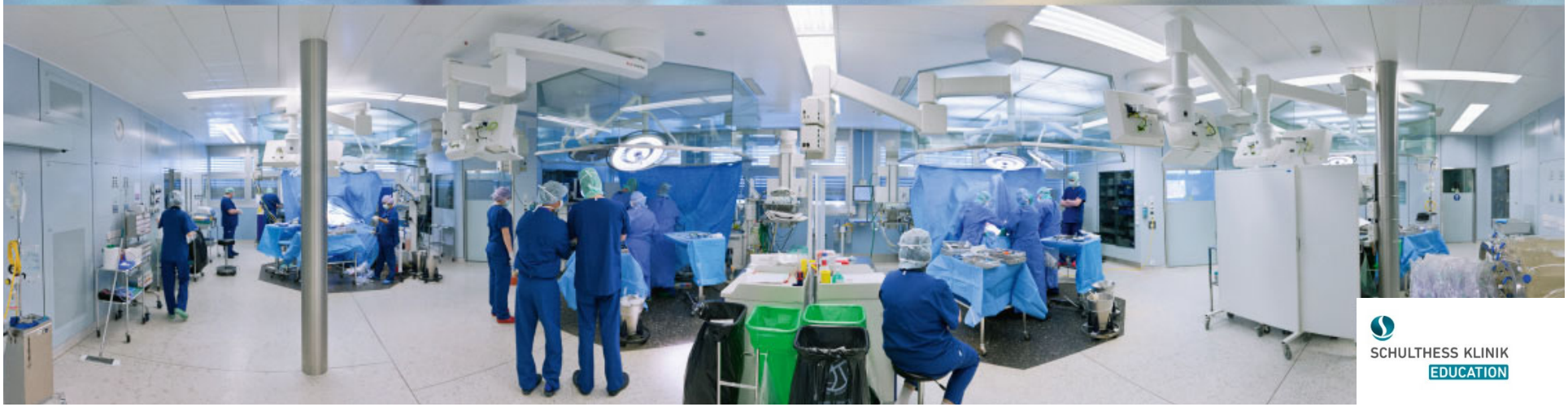

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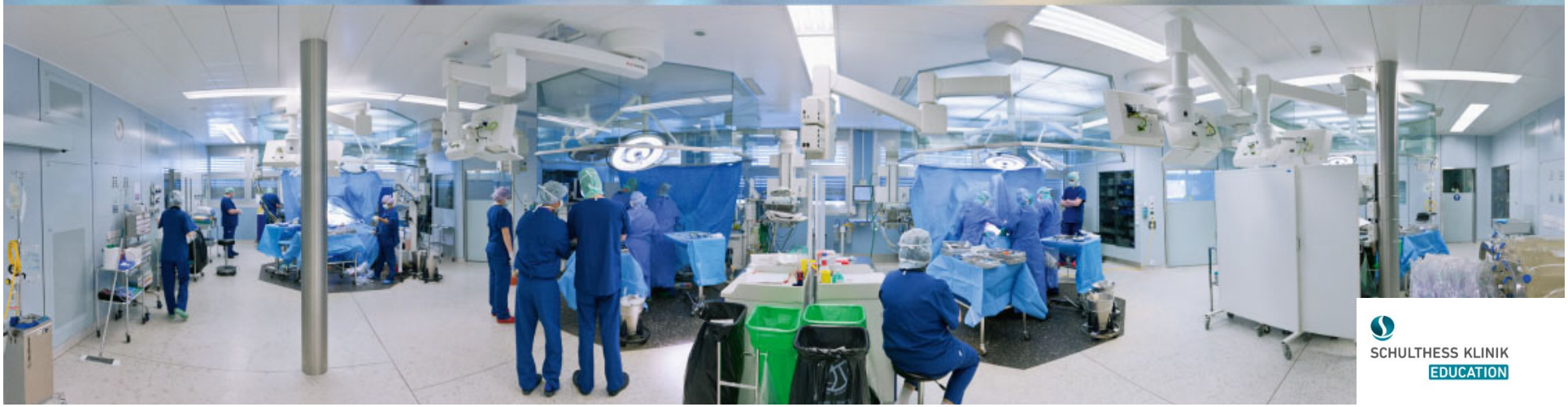
Disclosure

- **Consulting Fees: DePuy Synthes, Medacta**
- **Royalty: DePuy Synthes**



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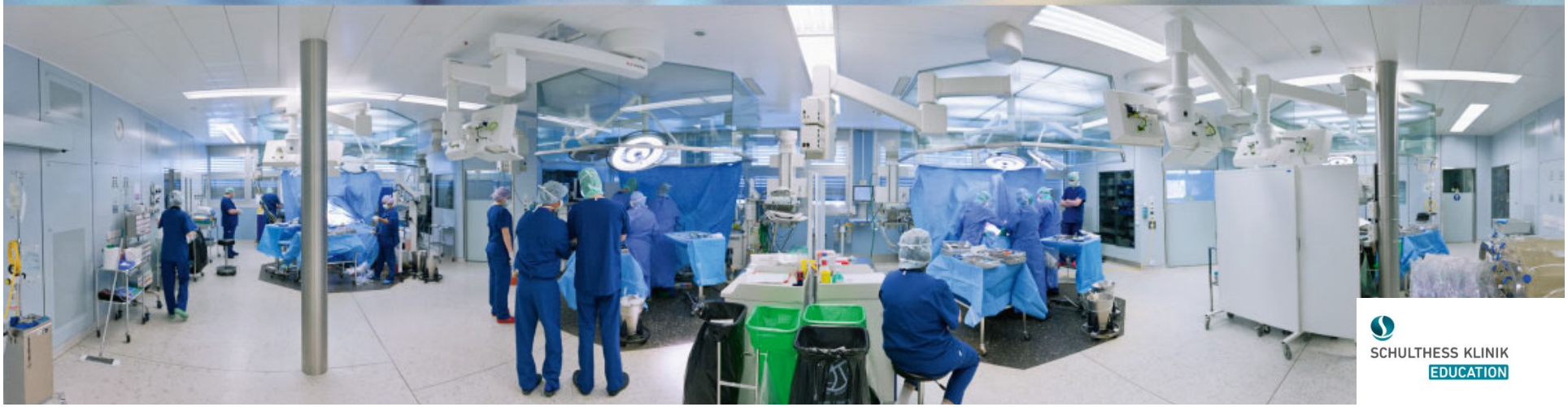

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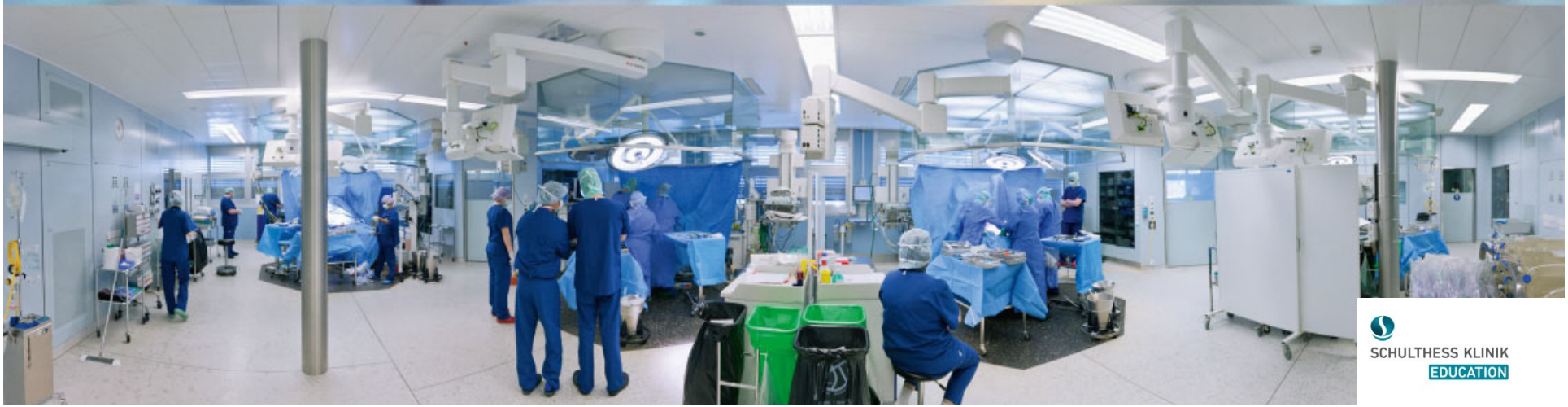

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EXCISION IS A SHORTENING

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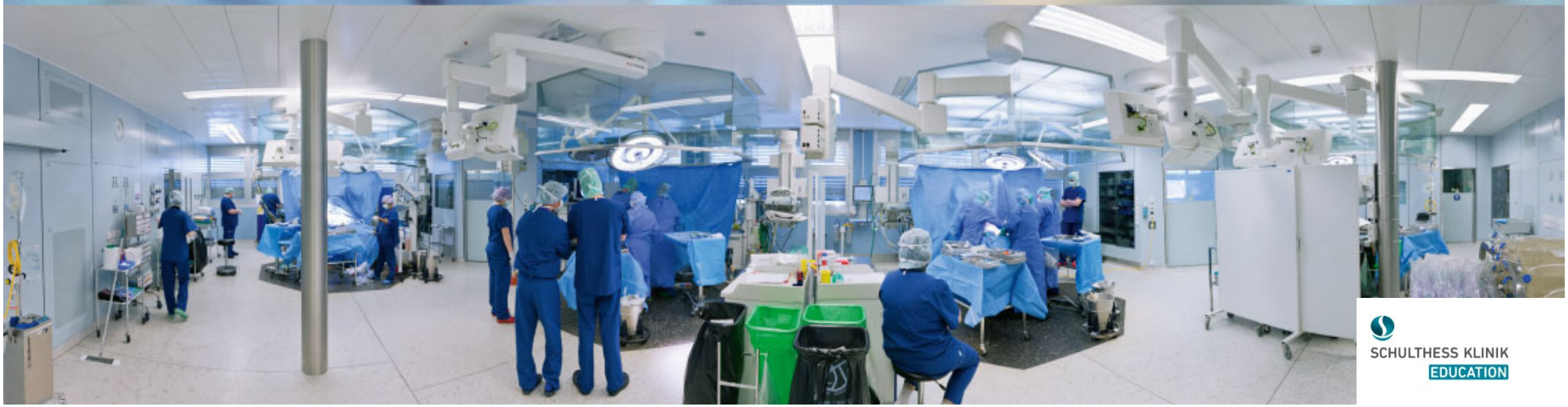

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Master's Technique: Open Wedge Osteotomy

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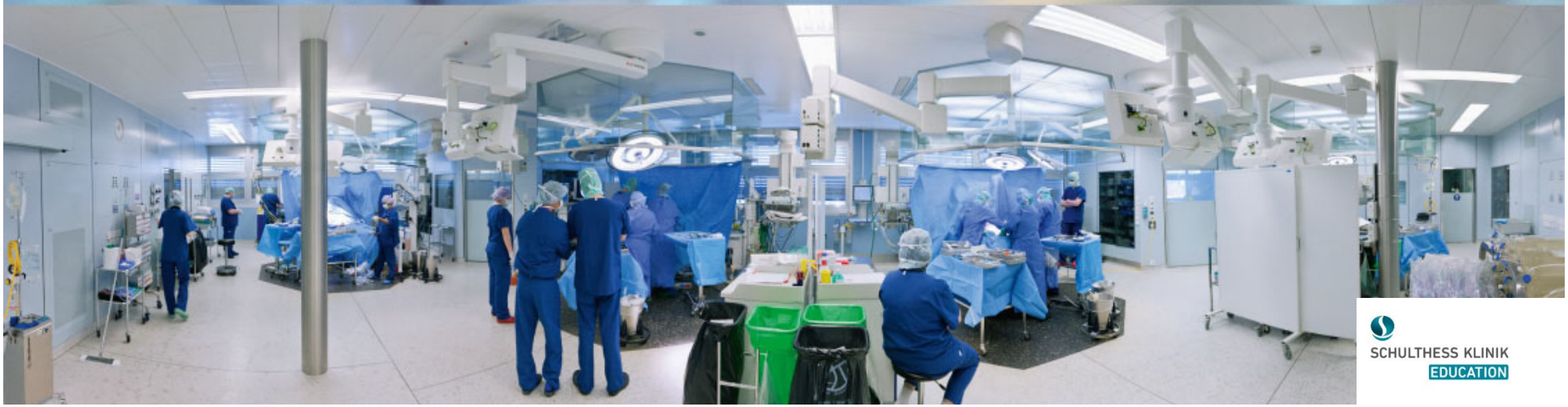

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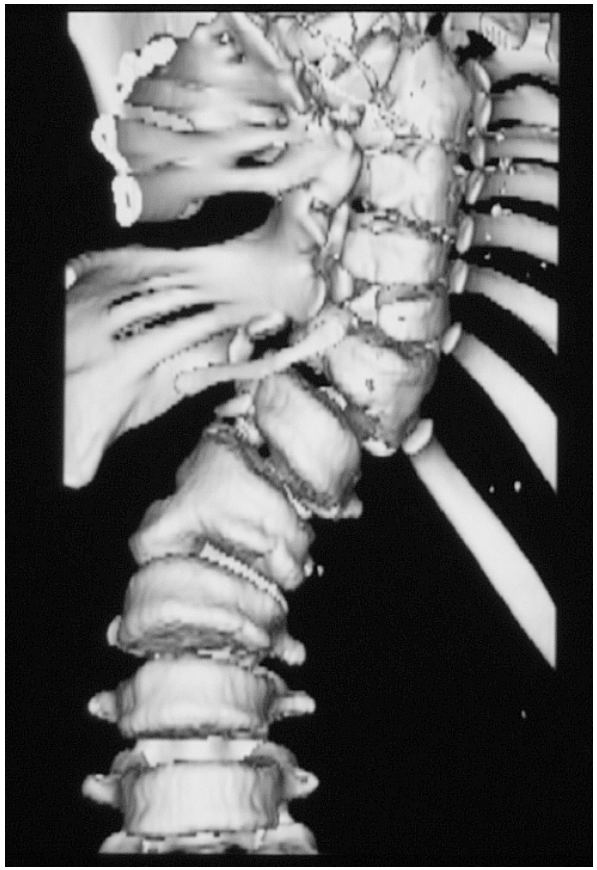
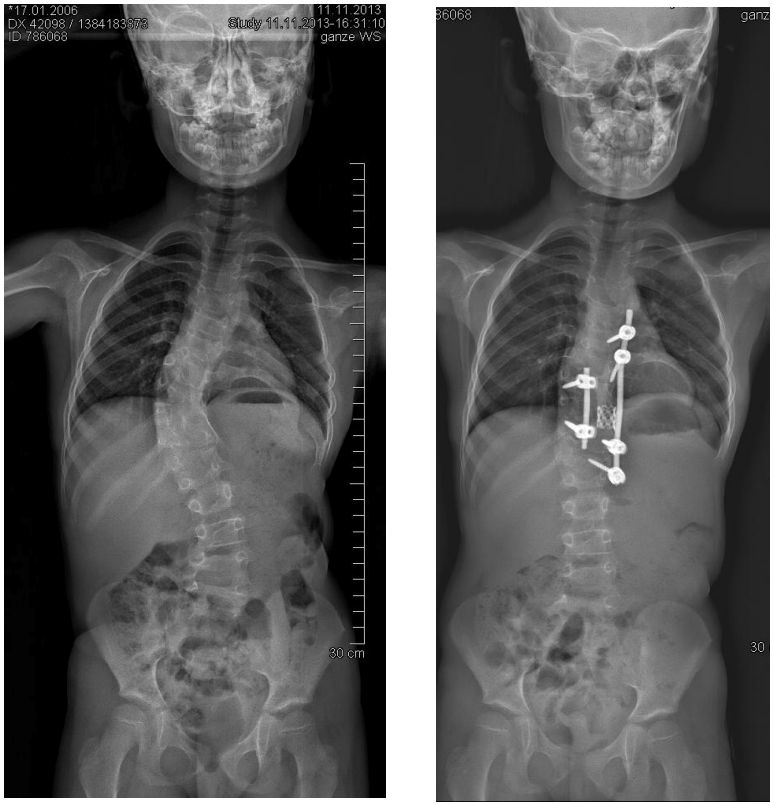
Introduction

- 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



Vertebral column lengthening with open wedge osteotomy in congenital bars

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

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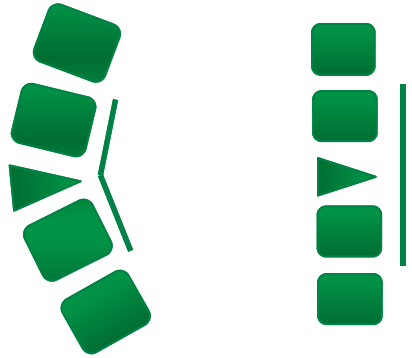
Introduction

- Congenital spinal deformity
    - Unsegmented bar – no growth

Introduction

- Congenital spinal deformity
  - Unsegmented bar – no growth
  - Contralateral side – growing

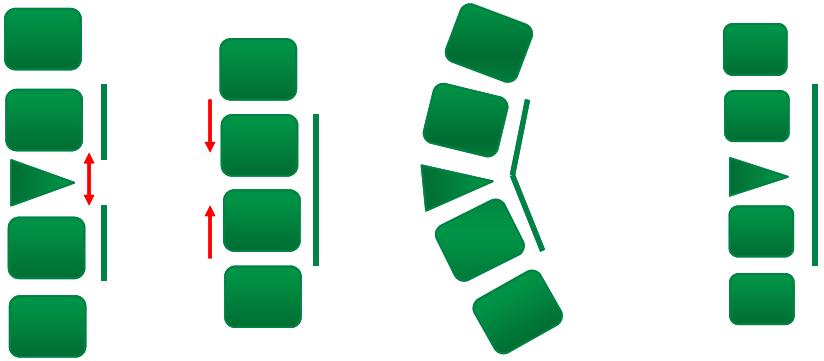


Introduction

- 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

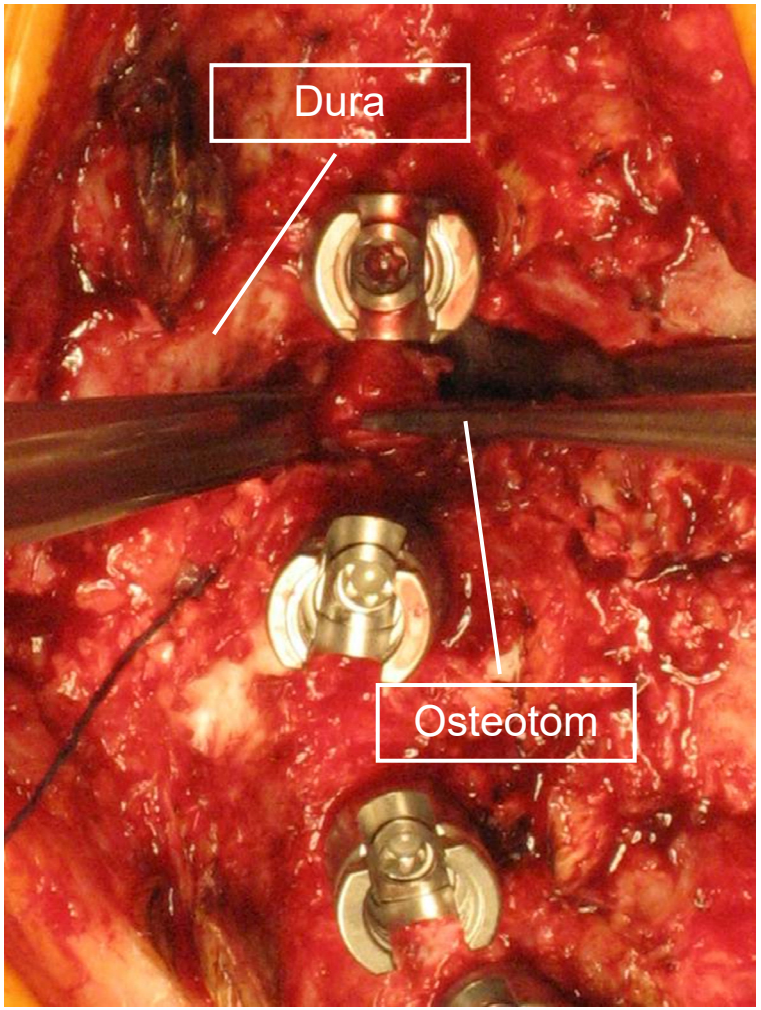
Surgical technique

- 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

cutting the bar

cranial

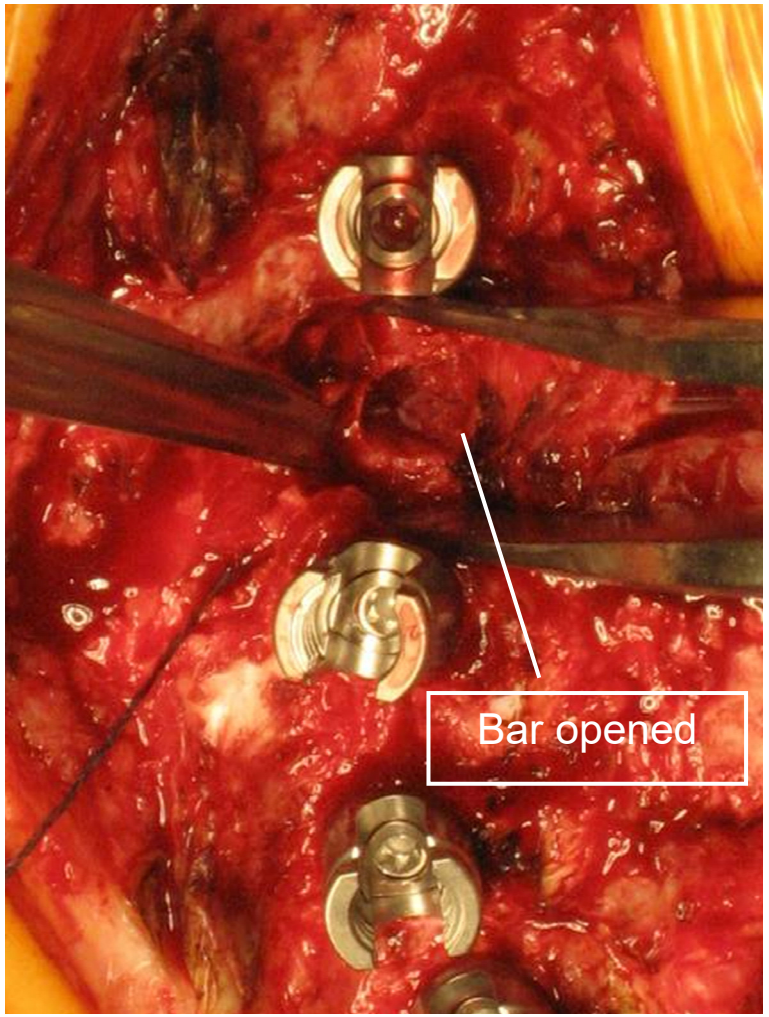
left



caudal

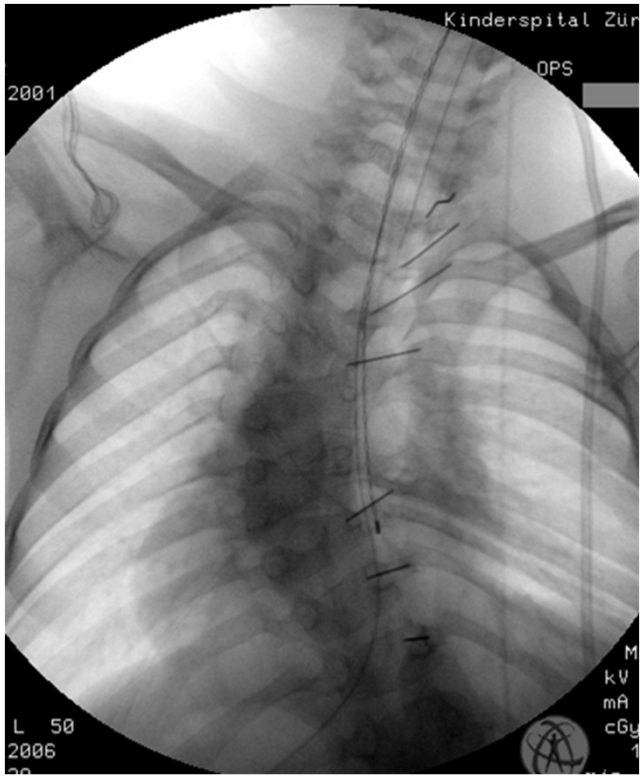
opening the wedge

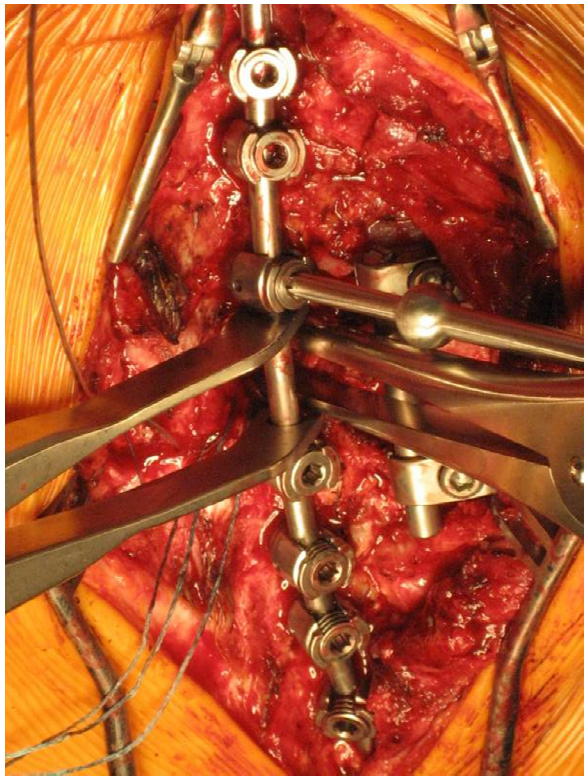
cranial

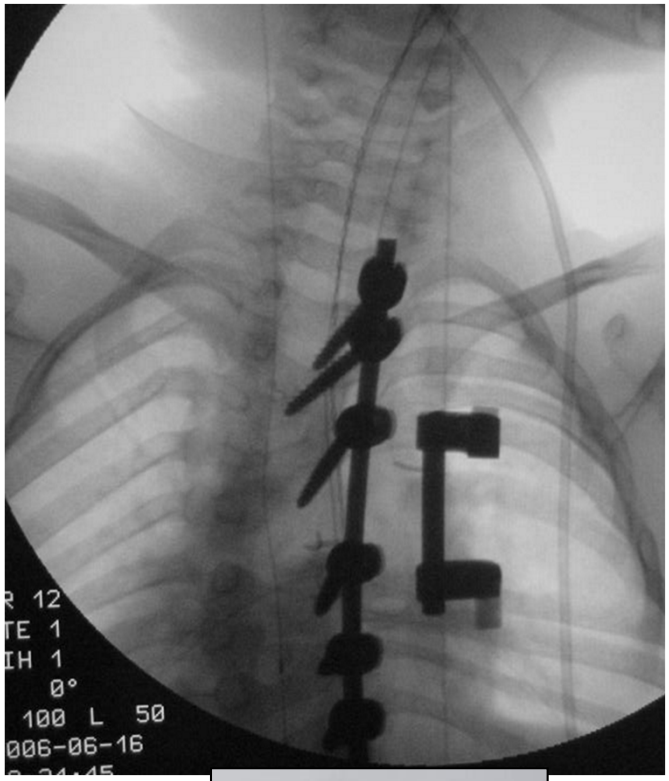


caudal

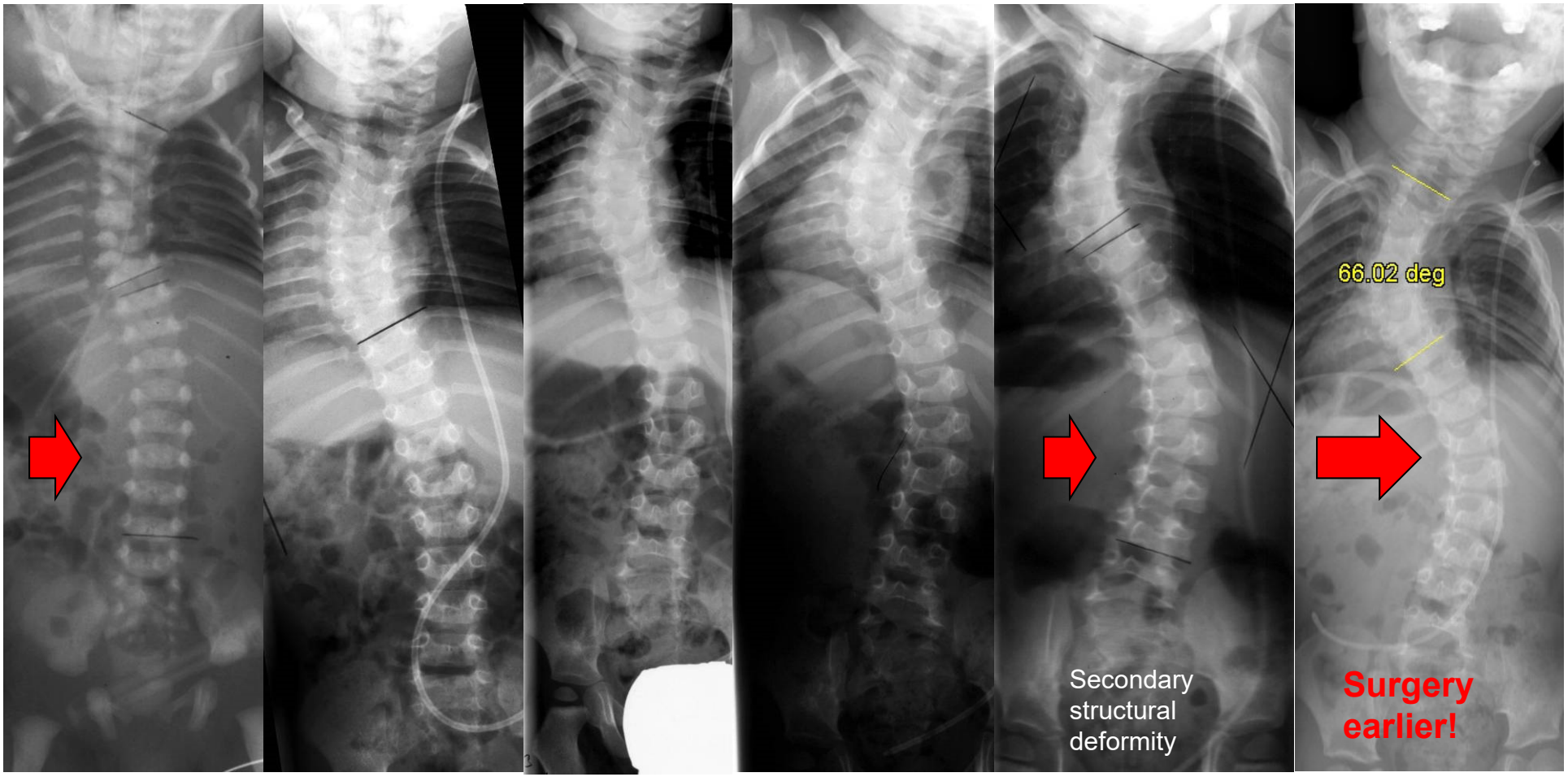
Immediate correction





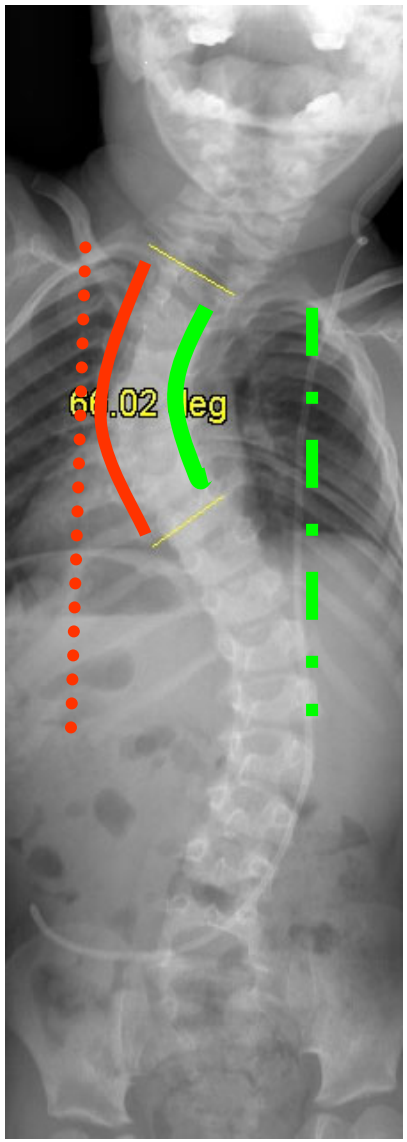


Case 1

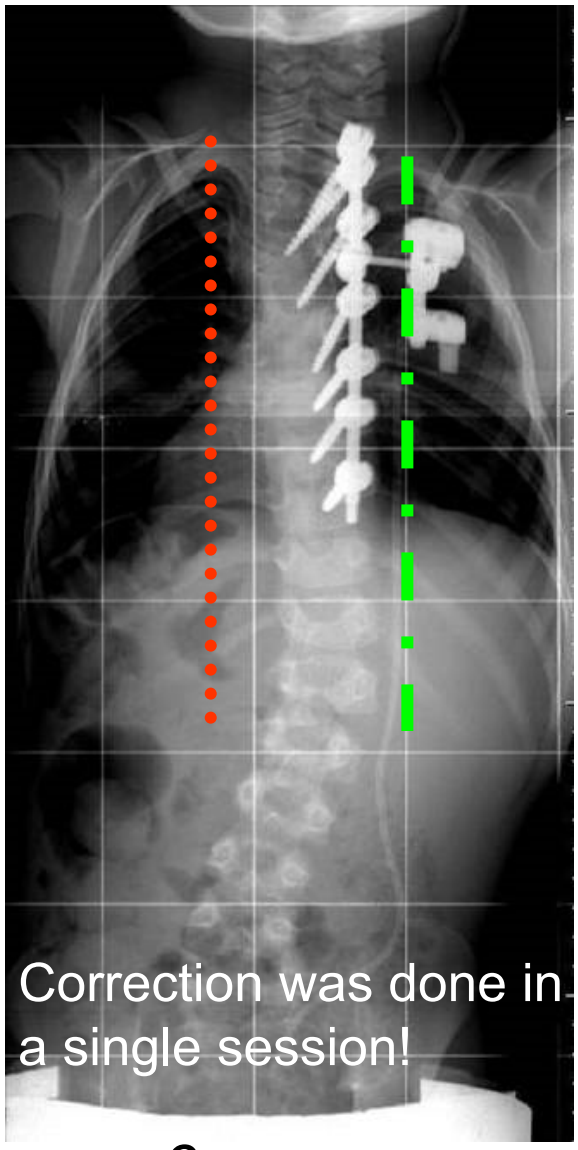


1 day | 1 year | 2 years | 3 years | 4 years | 5 years

Reversal of progression

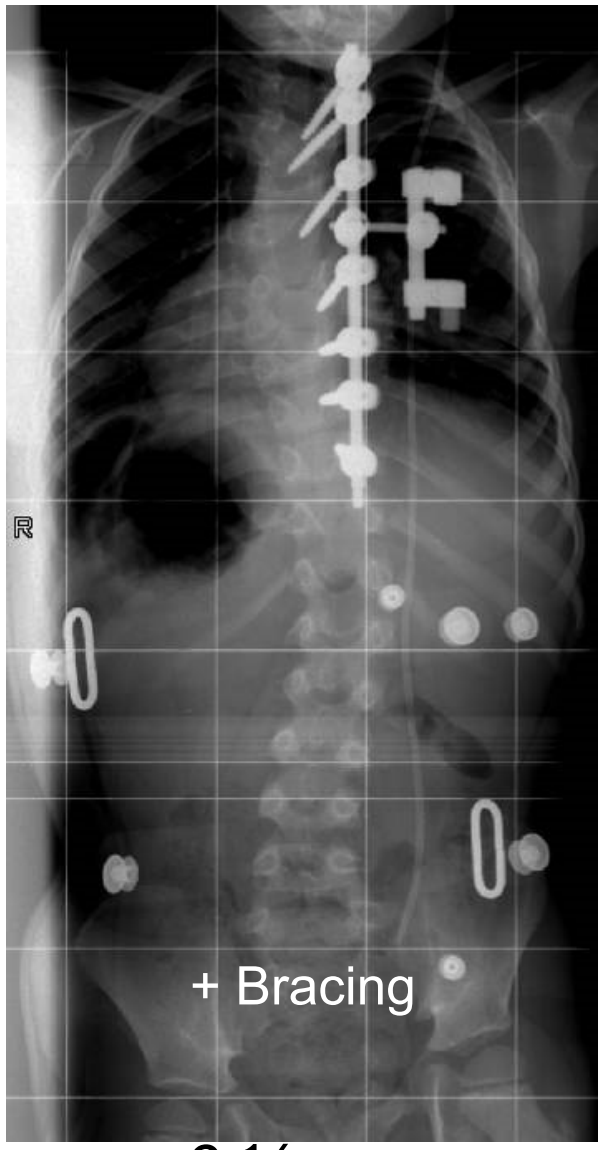


5 yrs



6 yrs

Thoracic high



6 ½ yrs

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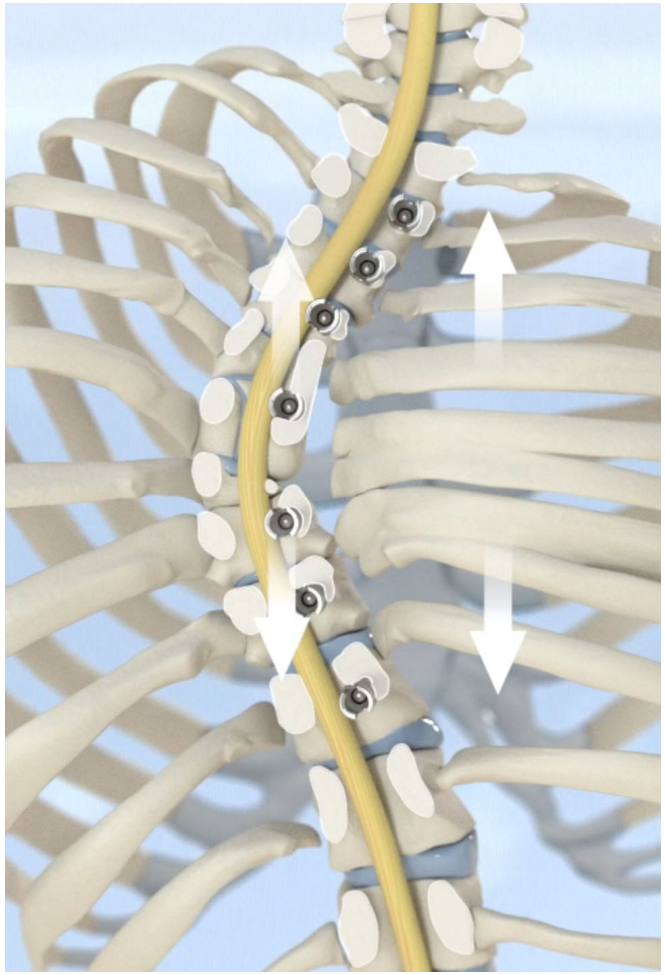
Patient population

- 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)

Initials	Age yrs	sex	N° of instr levels	N° of distract	Halo-traction	Complications	F-up yrs
ML	4.5	F	T2 – L3	8	no	no	17
PE	3.5	F	T1 – L2	8	no	Screw loosening	11
ZsM	2.5	M	T5 – L1	4	no	Intraop neurol – postponed surg Screw loosening	9
KN	5	M	T2 – T11	5	no	Intraop neurol – postponed surg	8
PM	3.5	M	T1 – L1	4	yes	Screw breakage – no consequences	6.5
SJ	3.5	F	T1 – T9	2	no	no	4.5
DG	5.5	M	T1 – T5	2	no	Postop dysbalance, hence 2nd suregery	3.5
MT	5	F	T7 – L1	0	no	no	1

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