

Treatment of Flexible Scoliosis in Children with the Ellipse Magec Rod in Combination with VEPTR Fixation

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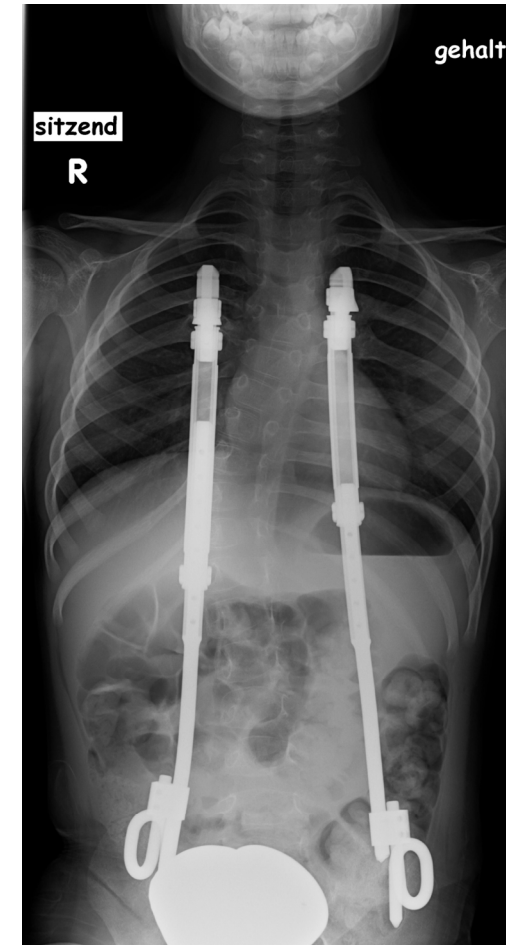
Flexible Pediatric Spinal Neuromuscular Deformity

- No touch techniques
(bilateral VEPTR)

Campbell et al. 2003, 2007

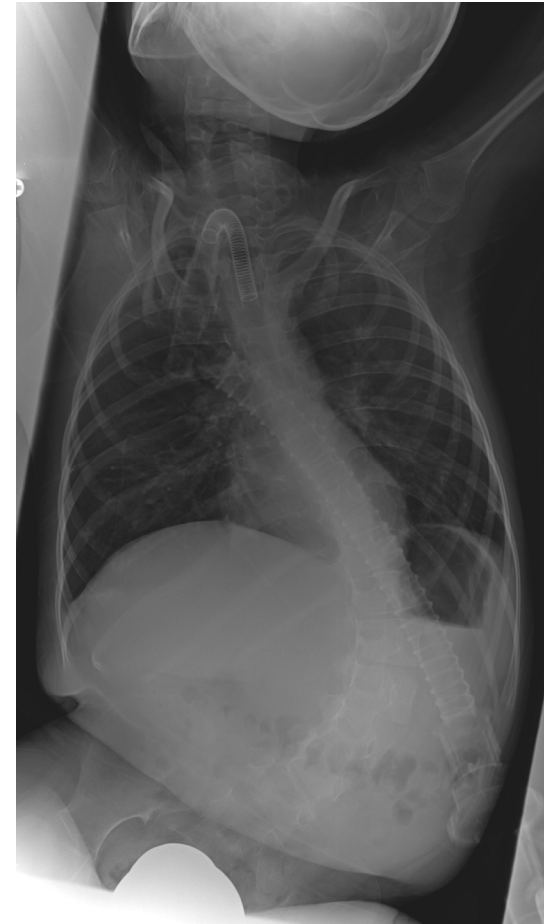
Advantages:

- Straightening the spine
- Expansion of the thorax
(increase rib inclination angle)
- Less risk of autofusion



However ...

- Repeated lengthening surgeries
- Anesthesia problems in children with impaired lung function
- Increased risk of implant infection
- Psychological problems



Problem / Objective

Neuromuscular pediatric population

- Benefit bilateral VEPTR construct
- Quality of life improvement / Sitting balance
- Compromised respiratory system
- High risk of anesthesia

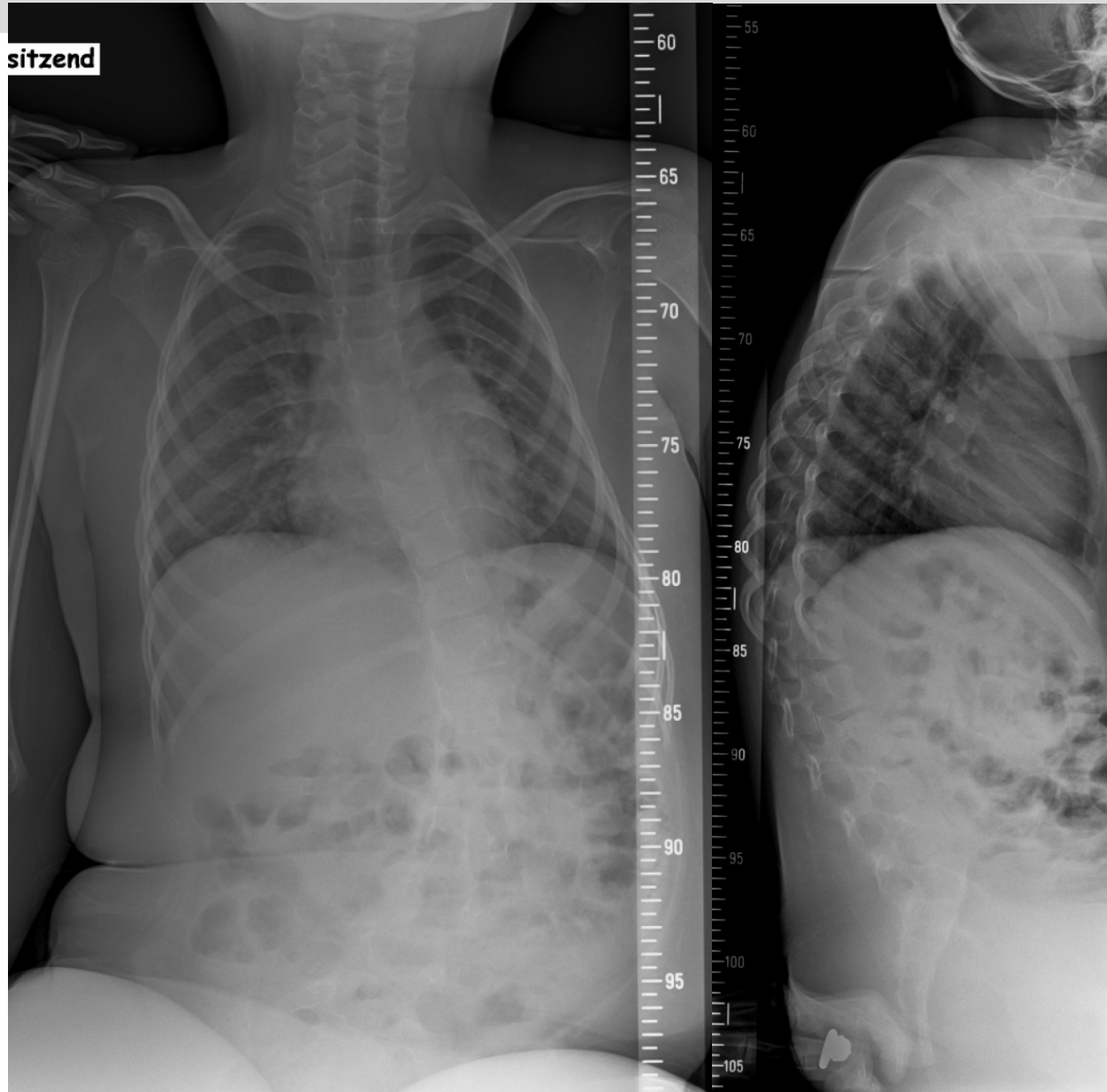
→ Externally controlled distraction system, Magec

Akbarnia et al., Spine 2012

Cheung et al., Lancet 2012

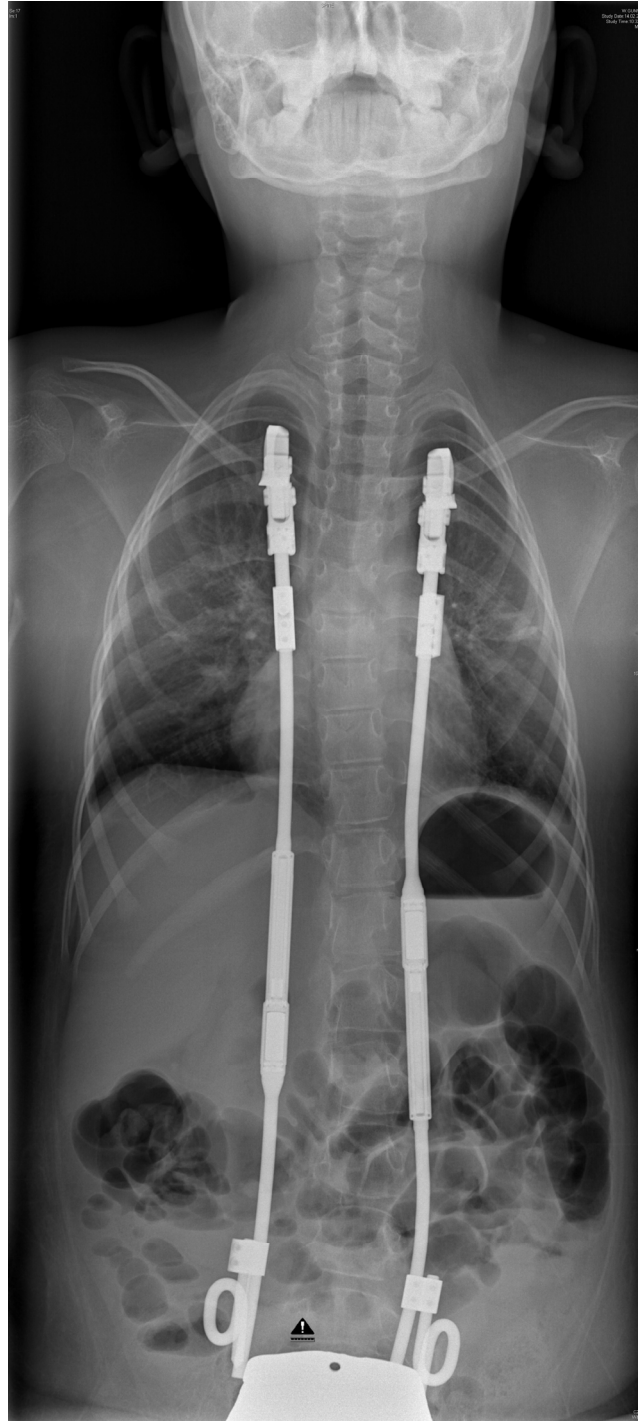


SMA Type Ib, 7 yrs old, flexible deformity, wheelchair ,
lung function problems, night ventilation



SMA – Anesthesia problems with ventilation, ICU repeatedly





Magec outside the spine

- N= 11
- Age av. 9 yrs
- Sex 5 female, 6 male
- Diagnosis:
 - 7 SMA (6x SMA II, 1x SMA Ib)
 - 1 Rett syndrome
 - 1 Congenital myopathy
 - 1 Marfan
 - 1 paraplegic due to intrauterine Neuroblastoma

Magec outside the spine

4 pts. prior VEPTR implantation

- Av. 5.25 lengthenings (2-9)

Why change to Magec

- Infected implant , BMI low (8), new concept
- Repeated surgeries, respiratory problems, repeated ICU

7 pts. Magec first spinal surgery

12 Magec lengthenings in 5 pts (3x n=3, 2x n=1, 1x n=1)

Scoliosis

Cobb before surgery (n=11)	Cobb after Magec	% of correction
67°	31°	54%

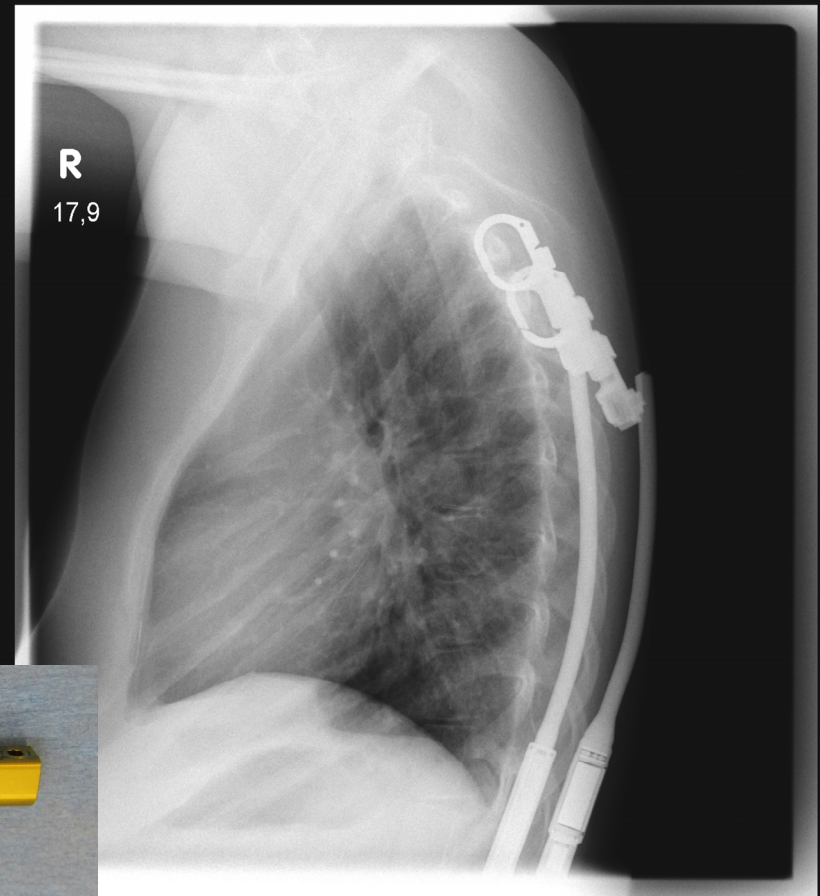
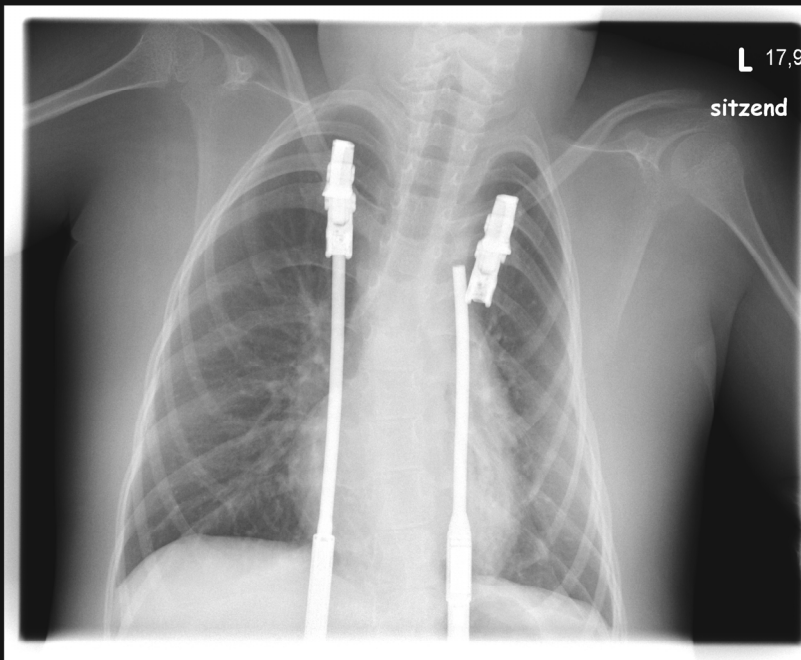
Cobb before Magec lengthening (n=12)	Cobb after Magec lengthening	% of correction
27°	22°	20%

Kyphosis / Lordosis

Kyphosis before surgery	Kyphosis after Magec	Kyphosis before lengthening	Kyphosis after lengthening
45°	35°	46°	45°

Lumbar Lordosis before surgery	Lordosis after Magec	Lordosis before lengthening	Lordosis after lengthening
29°	26°	24°	27°

Complications n=2

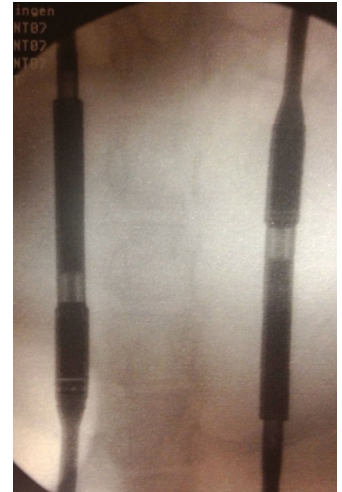


Conclusions

Magec outside the spine in flexible scoliosis

- works
- lengthenings every 3 months are possible
- spinal correction occurs similar to VEPTR results
- Thorax is enlarged (parasol effect)
- Pelvic obliquity

- Some technical considerations
(5.5 mm rod to 6 mm fixation)



Open Questions

- Multiple “physiological” lengthenings decrease risk of autofusion, stiffness or ossifications

