Non-Surgical Treatment of Non-Idiopathic Scoliosis

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SOSORT 2014 Educational Course

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Institut für Physikalische Therapie, Prävention und Rehabilitation

Background

There is a clear trend towards early surgery, but this can be associated with some problems:

- loss of fixation due to bone - anchoring failure
- implant failure
- wound dehiscence and infection
- neurologic injury
- chest wall and spinal rigidity due to scar tissue
- development of junctional deformities at the ends of instrumented segments

The conservative treatment of non-idiopathic scoliosis thus still is a valuable therapeutic procedure, especially as a delaying tactics.

Background

To keep in mind:

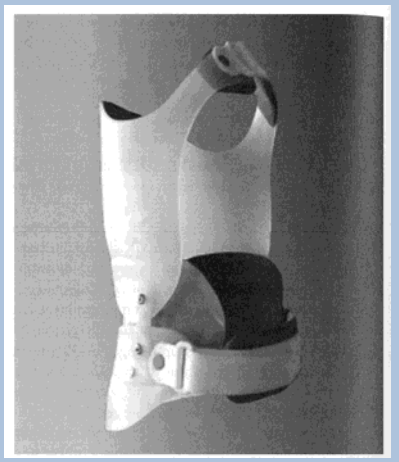
- Patients with a non-idiopathic scoliosis are suffering from a (mostly) severe basic disease.
- Beside the scoliosis, the patients are suffering from symptoms resulting from or associated with the disease (eg. pathologic muscle tonus, paralysis, mental retardation, hip deformity…).
- Defining a standardized treatment is impossible.

Possibilities of conservative therapy

- Bracing
- Casting
- Halo - Gravity Traction
- Physiotherapy

Bracing

- The aim of bracing depends on the basic disease, the extent of the curves, and other clinical symptoms:
  - correction of the curves
  - stabilization of the curves
  - obtaining sitting ability
- There are different types of braces and rules for wearing them.



Hefti, 2006

Bracing

- Our experience with bracing:

Cerebral Palsy	hypertonic - hypotonic +
Duchenne´s Muscular Dystrophy and Spinal Muscular Atrophy	-
Tethered Cord Syndrome (not active / after release)	+
Spina Bifida (without active tethered cord)	+
Marfan Syndrome	+
Osteogenesis Imperfecta	+ (Limitation: bone quality!)
Mucopolysaccharidosis	+
Neurofibromatosis	-
Skeleton Dystrophy	- / +

Bracing

- Possible problems associated with bracing:
  - aggravation of the curvatures despite bracing
  - loss of function (motion, respiration)
  - loss of independent activity and participation
  - brace-induced rib deformity
  - damaged skin
  - lack of acceptance

Seating adjustments and wheelchair modifications

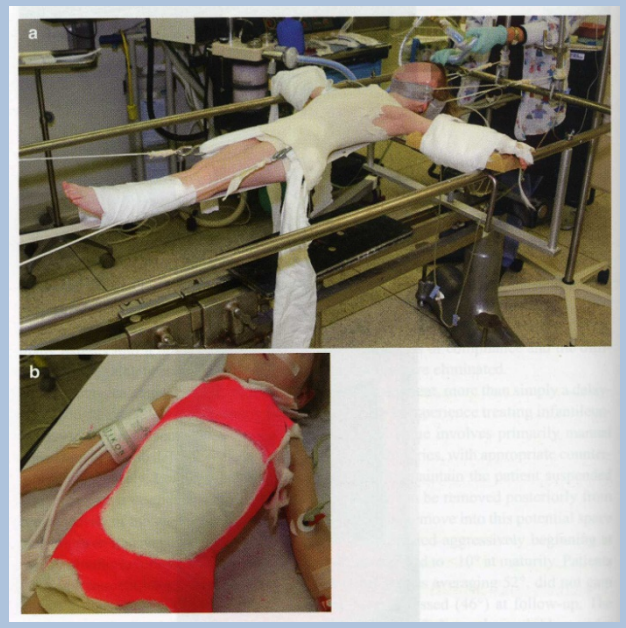
- If bracing fails, seating adjustments and wheelchair modifications may be an alternative

http://www.ottobock.com

http://pro.ortholutions.de

Casting

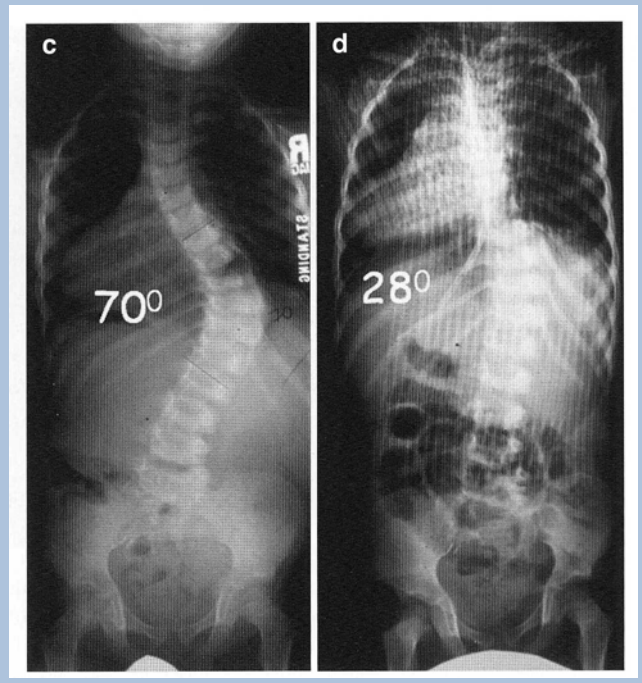
- cast is applied under traction
- patient is under anesthesia
- cast change every 2 – 4 months
- series of 3 – 5
- afterwards switch to brace
- aggravation? return to cast for a period of 4 months



Johnston II, 2011

Casting

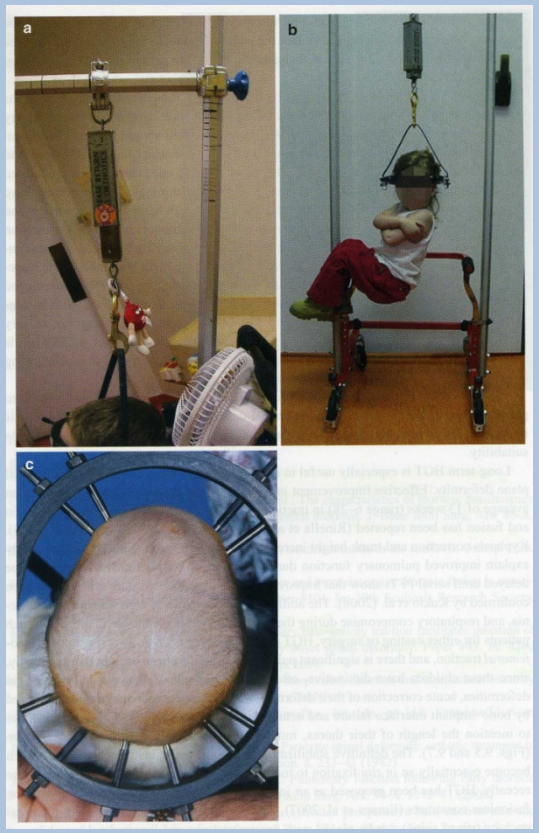
- Mehta, 2005:
- early beginning of treatment
  (mean age 19 months,
  average curve 32°)
  reduction to < 10° at maturity
- later beginning of treatment
  (mean age 30 months,
  average curve 52°)
  no progression (46°)



Johnston II, 2011

Halo-Gravity Traction

- minimum of 6 pins
- initial traction with 5 – 10 lb
- step by step increasing of traction to 50 % of body weight
- 2 – 6 weeks
- careful neurologic monitoring (cranial nerve testing, upper and lower extremity strength and reflex testing)
- patients may carry out dynamic body action
- patient auto-relieve is possible

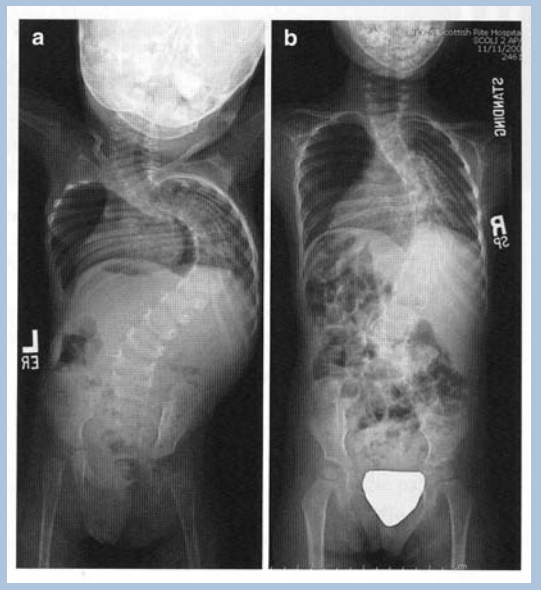


Johnston II, 2011

Halo-Gravity Traction

- effective improvement in trunk shift and coronal deformity, preparing for casting or surgery (mobilization, neurological status)
  (Rinella et al. 2005, Sink et al. 2001, Walick et al. 2008)
- benefit for respiratory mechanics
- Kuklo et al, 2008:

  9/62 complications (nystagmus, sensory changes, one cranial nerve lesion)



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Physiotherapy

Aims	Methods
▪ mobility of the spine ↑	→ open the concavity (movements, positioning)
▪ „know the midposition“	→ training of the proprioception
▪ daily life activities ↑	→ functional training
▪ ventilation of compressed lung segments	→ chest physiotherapy
▪ physical capacity↑	→ physical activity ↑

Summary

- no standards
- specialized center with conservative and operative options
- experienced team (MD, surgeon, physiotherapist, occupational therapist, technician)
- longtime accompaniment
- step by step individual decision making, depending on the basic disease, current clinical symptoms (due to the scoliosis and the basic disease), age, personality and acceptance by the patient

Thank you for your attention!