The halo traction and anterior arthrodesis are today still indispensable in the treatment of severe scoliosis? There may be any innovative proposal with Magnetic rod?

TIZIANA GREGGI
Elena Maredi, Francesco Lolli, Francesco Vommaro, Kostantinos Martikos, Andrea Baioni, Antonio Scarale, Stefano Giacomini, Mario Di Silvestre

Spinal Deformity Surgery Department, Rizzoli Orthopaedic Institute, Bologna, Italy
Treatment options for severe scoliosis (>100°)

- Posterior release and Halo-gravity traction (HGT) for several weeks and posterior fusion (contraindicated because of cervical spine recent previous surgery)
- 3-column osteotomies and posterior fusion (very aggressive for bleeding and mechanical stress on a spinal cord with syringomyelia)
- Anterior and posterior approach
- ???
**Introduction**

Surgical treatment for severe scoliosis has been characterized by a combined approach (anterior release and posterior fusion), the pedicle screws have reaffirmed the role of only posterior approach.

**Materials and methods**

3 patients are treated for severe scoliosis using Transient magnet rod for internal distraction followed by rod removal and definitive PSF.

**HALO patient**: 17 year old Female with syrinx and R-thoracic scoliosis of 140°, progressive halo-traction for 3 weeks and releases by Ponte’s osteotomies followed by instrumentation from T2 to L3 with 4 rods.

The correction of thoracic scoliosis and kyphosis of 46.4% and of the 53%(73° and 67°) respectively. No neurological complications, Estimated perioperative Blood loss 1000cc, hospitalization of 41 days.
MCGR SYSTEM

Case A:
12 year old female with severe thoracic scoliosis of $120^\circ$, syrinx and Chiari I treated by occipitocervical decompression. First Stage: Ponte’s osteotomies and pedicle screws T3-L4 with MCGR in the concave side; daily Ultrasound guided lengthening with external controller for 3 weeks followed by Second stage posterior arthrodesis and thoracoplasty.

Case B:
15 year old female with severe thoracic kyphoscoliosis of $115^\circ$. We performed the same 2 stage technique of case A, pedicle screws instrumentation from T3 to L4.

Case C:
21 year old female with Noonan syndrome, reduced bone mineral density and severe respiratory insufficiency and congenital heart disease treated in Infancy. Thoracic kyphoscoliosis of $130^\circ$, we performed the same 2 stage technique of case A, pedicle screws instrumentation T4-L3.
Pre-Op Clinical Picture and X-rays: case A

120°

90°
MRI and CT

Syrinx from C5 to C7 and thoracic, Chiari I malformation, NO INSTABILITY

NeuroSurgery

Occipitocervical decompression
Intra-Op Clinical Picture and Xrays

- Posterior release
- Temporary internal distraction by magnetic rod

Scoliosis decreased to 75°.
Post-Op Xrays II: after 3 lengthenings

Definitive intervention scheduled after 20 days of daily elongations
Results

After the second operation it was 42° with a total correction of 65%. No neurological complication, a mild Right sided pleural reaction.
Results

Case B: First stage, scoliosis decreased to 72°. After the Second stage it was of 45° of with a total correction of 60%. No neurological complication, a mild right sided pleural reaction right.

Case C: First stage, scoliosis decreased to 80° (correction 38%), The lengthening procedure is currently under process slowly every day. The girl developed respiratory distress which recovered in the Intensive Care unit.
Conclusion

The MGCR is a valid alternative in cases where the halo may be contraindicated in the presence of myeloradicular malformations. Halo traction may not be well tolerated by the patient or the family. The results in terms of correction are comparable and the psychological impact of the patient and the family of elongation with MGCR is favorable. Up to date little information is available in the literature.