

The Effectiveness of Pre-Operative Halo-gravity Traction (HGT) in Early Onset Scoliosis (EOS) and Severe Kyphoscoliosis: Clinical and Radiographic Study

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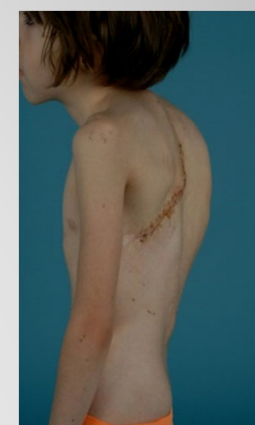
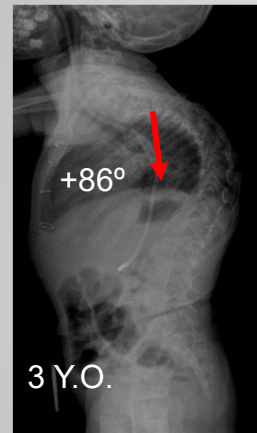
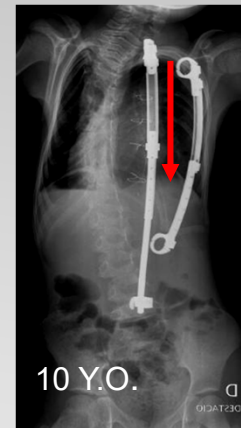
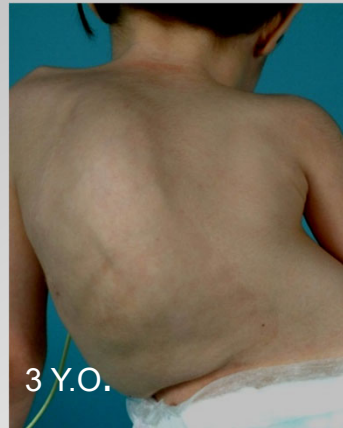
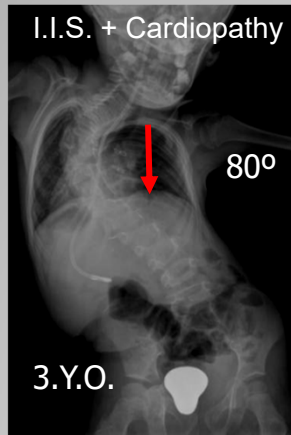


Disclosures

Consultant of K2M
Consultant of Synthes

- Introduction -

- ❖ Treatment of complex spinal deformity in E.O.S. remains a challenge. A rigid spinal deformity, poor pulmonary function, malnourishment and poor bone stock complicate surgical treatment



- ❖ **HGT** improves coronal and sagittal balance and facilitates the implantation of expandable devices where otherwise will not be possible



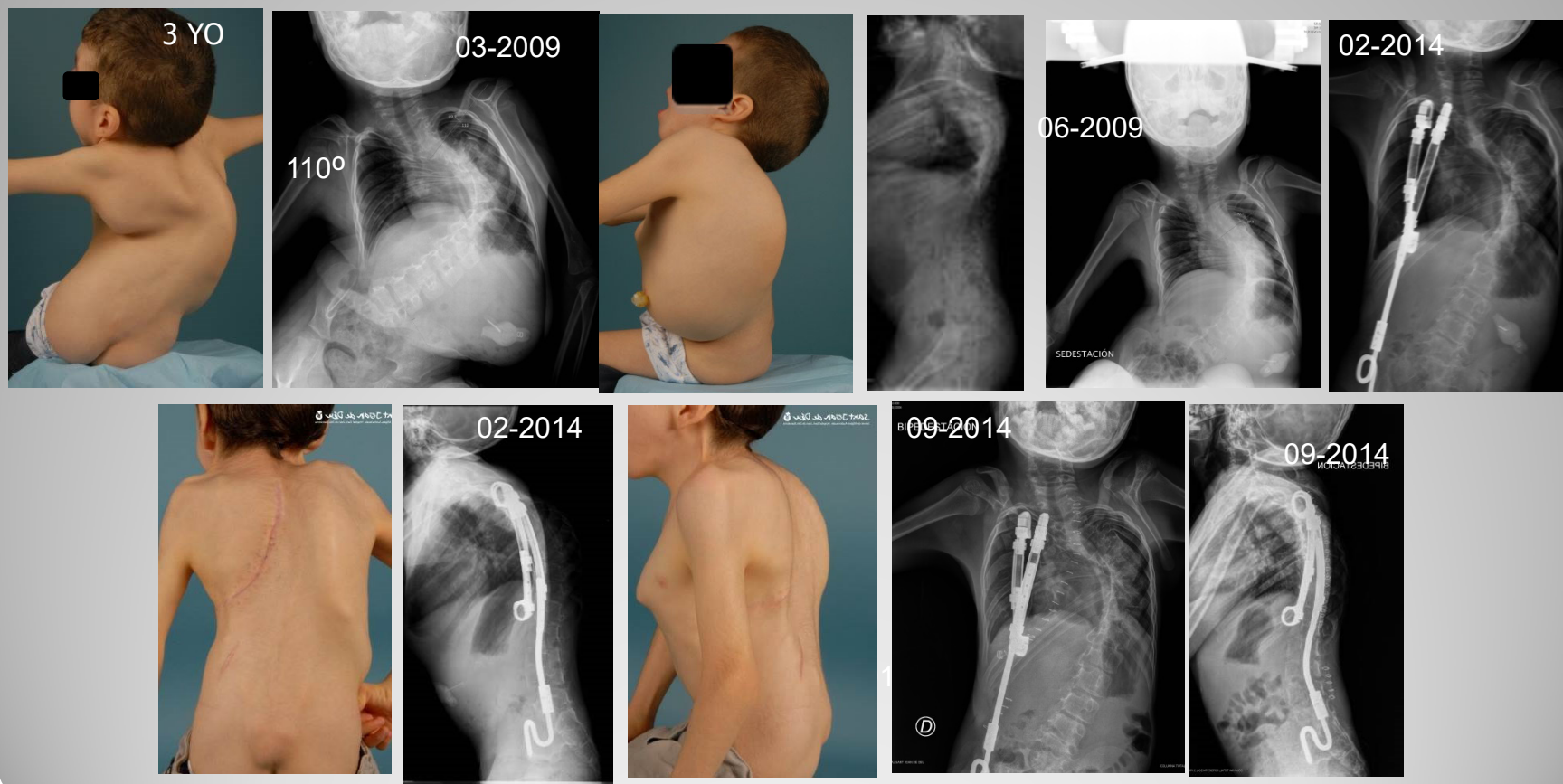
- ❖ The goal of the present study was to assess the efficacy of **HGT** in E.O.S. with severe rigid scoliosis/kyphoscoliosis.

Material and Methods

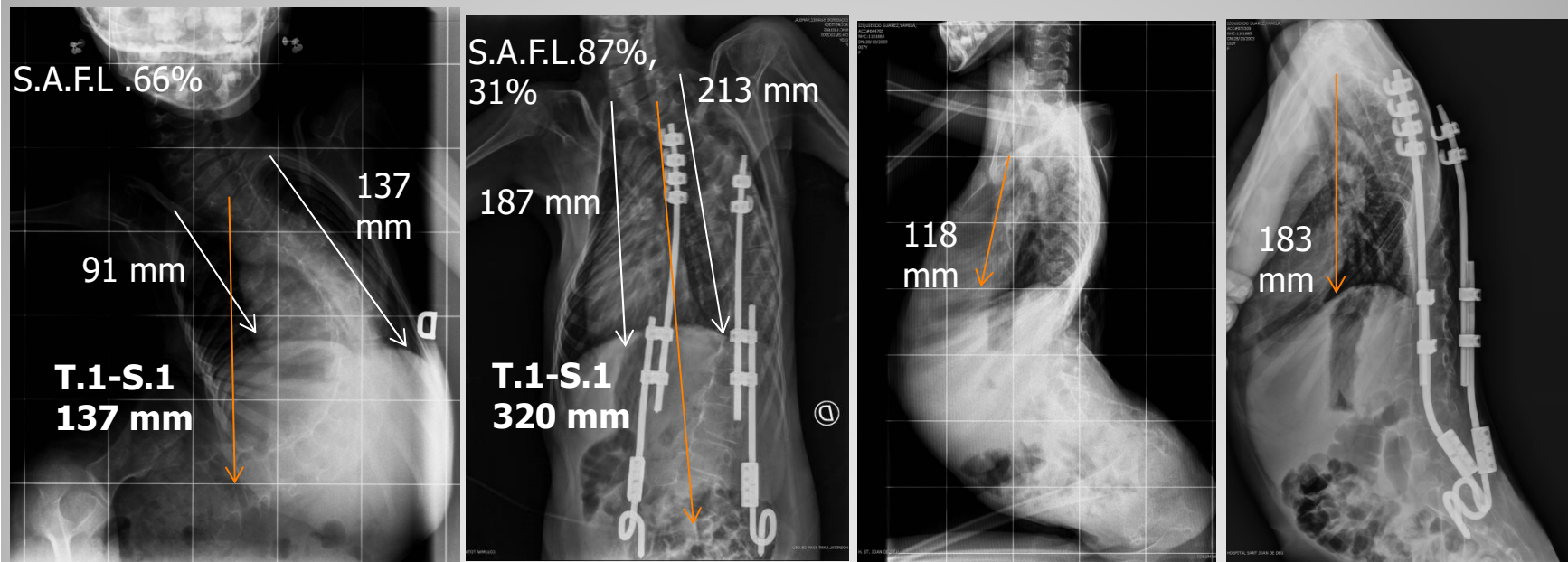
- ❖ A retrospective review of **21 patients** (11 ambulatory) treated in a single institution between 2005-2011, mean **follow up 35 months**.

- Material and Methods -

HGT protocol, included, gradual increase traction to about 40% of patients' body weight during 8 weeks



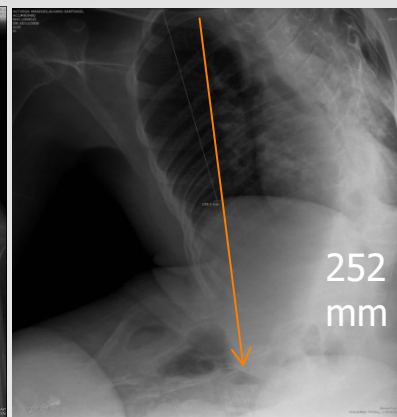
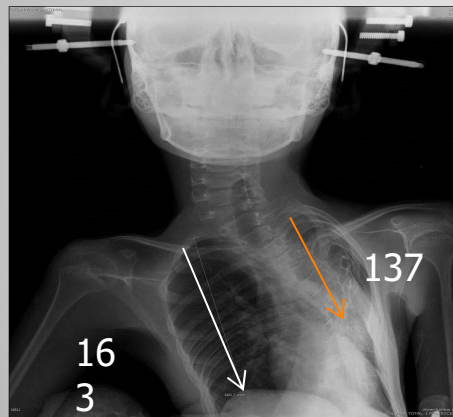
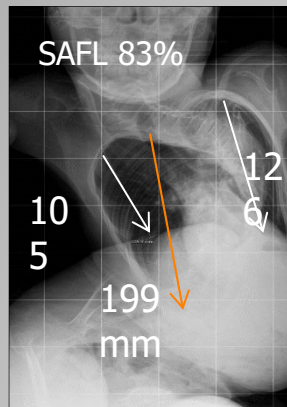
To analyze the impact of HGT on **curve flexibility** and **chest wall** improvement, the **space available for the lung (SAFL)** and the distance between **T.1-S.1** were used to measure the thoracic improvement



Campbell RM, et al. The characteristics of thoracic insufficiency syndrome associated with fused ribs and C.S. J Bone Joint Surg Am 2003;85:399–408.

❖ Results:

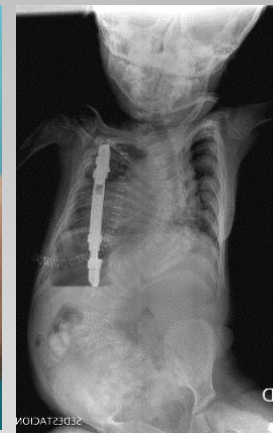
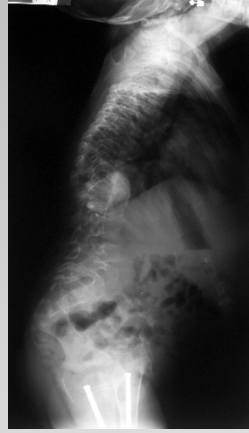
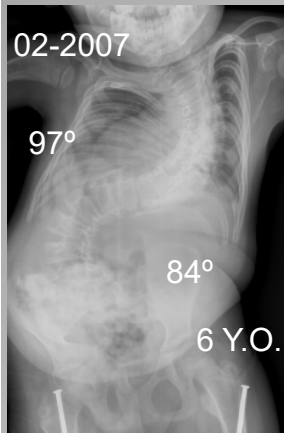
- 8 males, 13 females, mean age 9.3 Y. (range 3 – 17)
- Ethiology: 1 idiopathic, 1 congenital, 10 neuromuscular, 9 others (osteogenesis imperfecta, syndromic ...)



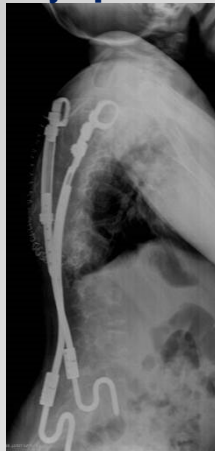
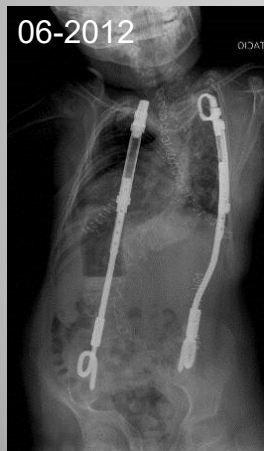
S.M.A.Type II

PREOPERATIVE
H.G.T.

❖ The use of HGT was **preoperative** in 15 patients and **perioperative** in 6 patients (previous spine surgeries)



O.I. , VEPTTR rib/rib, rib/pelvis, bilateral rib / pelvis, **removal of VEPTTR + PERIOPERATIVE H.G.T.**, definitely **posterior fusion**, 13 Y.O.

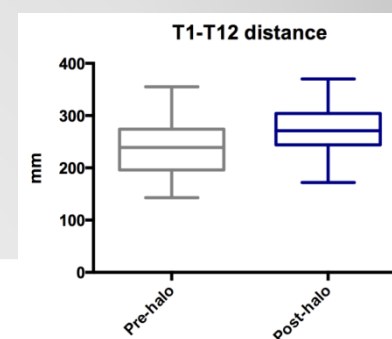
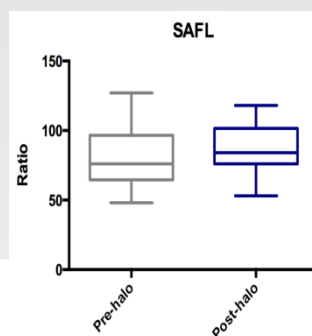
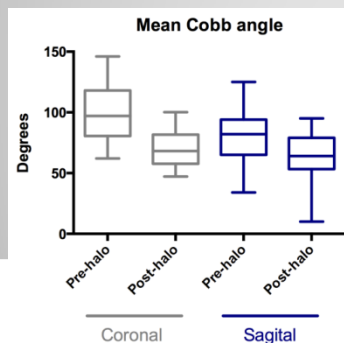


Removal of VEPTTR +
perioperative H.G.T:

Posterior fusion

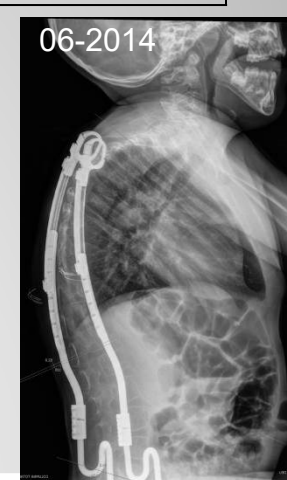
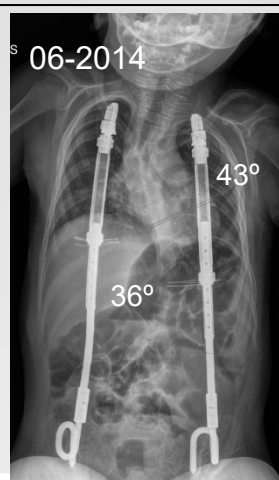
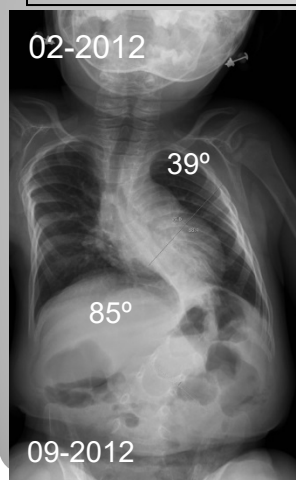
Results. With HGT mean values were : T-Student test $p < 0,05$

Mean values	Pre-Halo	With Halo	improvement (%)
Mean Preop. Coronal Cobb angle	99.3°	70°	27.7 %
Mean Preop. Sagittal Cobb angle	82°	62.8°	21.5 %
Mean SAFL index	79%	83.2%	5.3 %
Mean T1-S1 distance	235mm	269.5mm	14.2 %



Results: At the end of follow up the values were:

Mean values	Pre - Halo	End of follow up (mean : 35 month)	improvement (%)
Mean Preop. Coronal Cobb angle	99.3°	57.5°	41 %
Mean Preop. Sagittal Cobb angle	82°	53.7°	24.6 %
Mean SAFL index	79%	86.6%	9.6 %
Mean T1-S1 distance	235mm	298.1mm	26 %



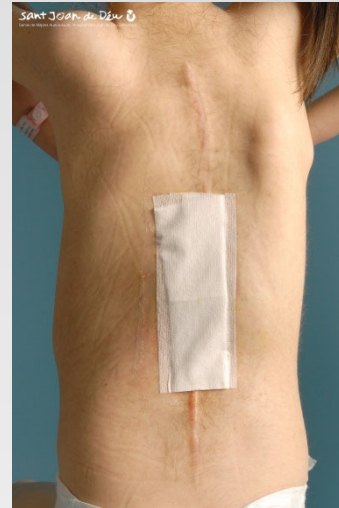
Results

- ❖ Complications : 1 pin infection that required removal and antibiotic treatment
- ❖ These results are **consistent with others published** in the literature.

Conclusions

- ❖ Unfortunately, there are **too many variables** to establish a rigid algorithm for the **indications and duration of halo-gravity traction**
- ❖ No clear guidelines exist as to the duration of HGT, but to achieve maximal benefit, it seems ranging 2 to 3 weeks will be enough (Park DK et al)

- ❖ A 9% improvement in pulmonary function and improvement of overall health status was seen in 19 of 22 patients reviewed by Ljiljana Bogunovicel (Spine Deformity, 2013)
- ❖ **HGT** is a **safe, well-tolerated method** of applying gradual, traction to maximize postoperative correction (24,6%), pulmonary function and nutritional optimization



*Thanks !
Gracias !*

