

MASTER'S TECHNIQUE: VCR & GROWING RODS

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Masters' Tips & Tricks

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DISCLOSURES

Last 36 months

Consultant: DePuy Synthes Spine, K2M, Medtronic (monies donated to charitable foundation)

Royalties: Medtronic (major), Quality Medical Publishing (minor)

Grants (WU): Axial Biotech, DePuy Synthes Spine, AOSpine & SRS

Philanthropic Research Funding (WU): Fox Family Foundation (Prospective Pediatric Spinal Deformity study); AOSpine & SRS (Scoli-RISK-1 study)

Fellowship Funding (WU): AOSpine North America (funds/fellow year)

Travel/Accommodations: AOSpine, BroadWater, DePuy Synthes, K2M, Medtronic, SRS, SSF, Stryker, The Spinal Research Foundation (reimbursement only)

Editorial: Associate Editorial Board of Spine, Editorial Board of the Journal of Spinal Disorders & Techniques and Scoliosis, Professional Advisory Board of Backtalk and the Scoliosis Association, Associate Board of the Journal of Neurosurgery: Spine, The Spine Journal, Associate Editor for iscoliosis.com and spineuniverse.com, Deputy Editor of Spine Deformity

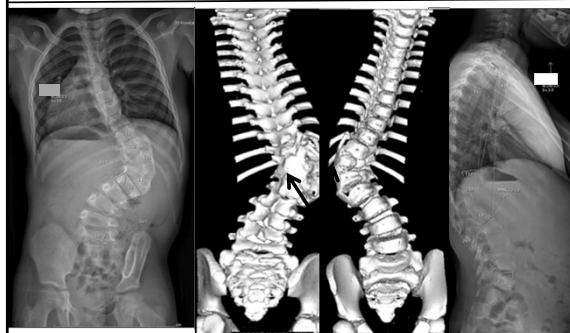
INDICATIONS: VCR & GR

- Limited
- Severe Localized Deformity in an EOS pt. where Apical Resection and Concomitant Cephalo-caudad Deformity Control is Needed
- Goal is to **AVOID** this Combined Treatment if Possible!
- Either VCR alone or GR alone, Delay tactics if possible!
- Prelim. HGTX can be very useful!

Post VCR: 217 CASES/ 42 < AGE 10

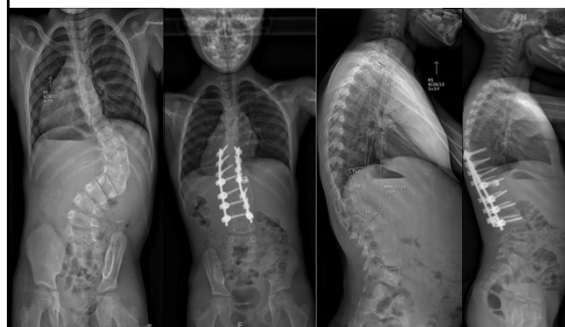
1. Posterior vertebral column resection for severe pediatric deformity. Minimum 2-year follow-up of thirty-five consecutive patients. *Spine* 2009;34:2213-21
2. Vertebral column resection for the treatment of severe spinal deformity. *CORR* 2010;468:687-99
3. Posterior vertebral column resection (VCR). *SRS e-Text Spinal Deformity*. www.srs.org, May 2011
4. Vertebral column resection in children with neuromuscular spine deformity. *Spine* 2012;37:E655-1
5. Antifibrinolytic agents reduce blood loss during pediatric vertebral column resection procedures. *Spine* 2012;37:E1459-63
6. Posterior vertebral column resection for the treatment of dystrophic kyphosis and dislocation associated with type-1 neurofibromatosis: a case report and review of the literature. *Spine* 2012;37:E1659-64
7. Complications following 147 consecutive vertebral column resections for severe pediatric spinal deformity: A multicenter analysis. *Spine* 2013;38:119-32
8. Predicting kyphosis correction during posterior-only vertebral column resection by the amount of spinal column shortening. *Spine Deform J (under rev 2013)*
9. Is there a Difference in Single Stage vs Staged VCR's regarding Clinical and Radiographic Correction and Complications? *Spine (under rev 2013)*

CONG. TL SCOLIOSIS: S/P ASF/PSF

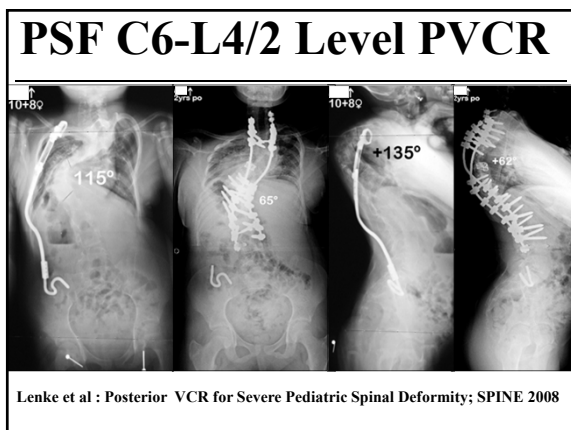
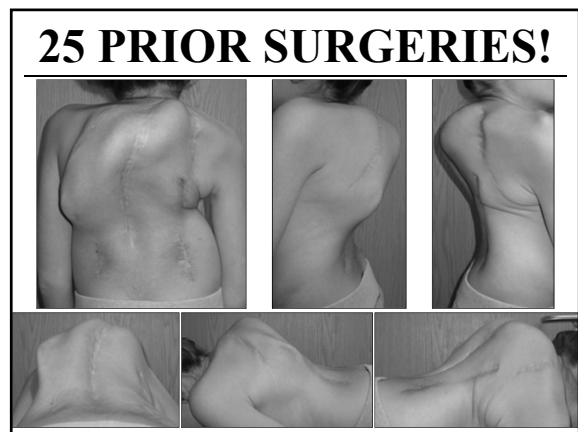
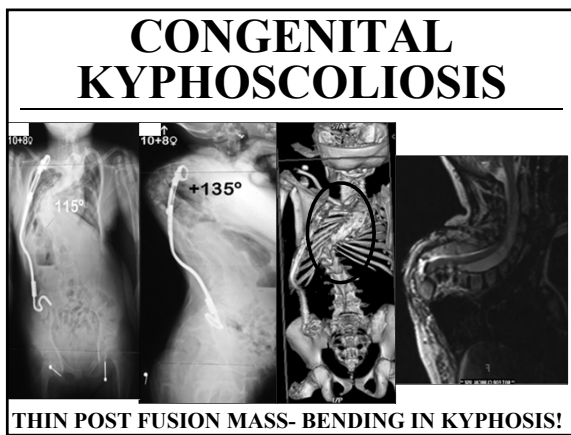
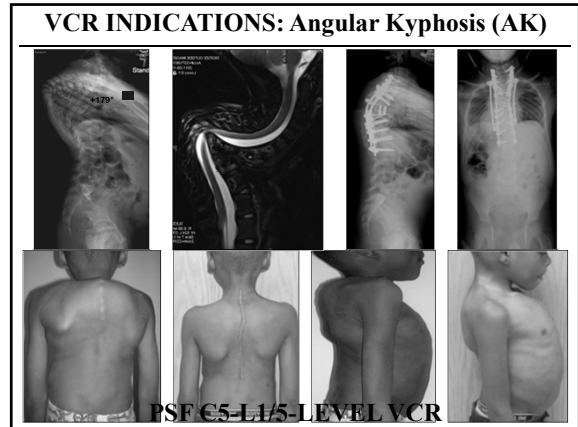


SHORT APICAL FUSION WITH PROGRESSION

REVISION PSF/T12 VCR



1 YEAR POSTOP AGE 7



IIS- AGE 2 + 9



Halo-gravity Traction vs Surgical Release before Implantation of Expandable Spinal Devices: A Comparison of Results and Complications in Early-onset Spinal Deformity

- Between 1997 & 2009, 124 children w/severe early-onset spinal deformity were treated with VEPTR or growing rods
- Before implantation of device, **12 underwent halo-gravity traction (HGT)** & **13 had a spinal release (SR)**
- Postop, SR resulted in better correction of scoliosis (46°) than HGT or no release (37 & 27° respectively) but **HGT provided better correction of kyphosis (48°) than SR or no-spinal release (27 & 9° respectively)**
- Device complications occurred in **54% of participants in the HGT group, 75% in the SR group and 28% in the control group**, and had a negative impact on final thoracic spine height

Caubet JF, Emans JB

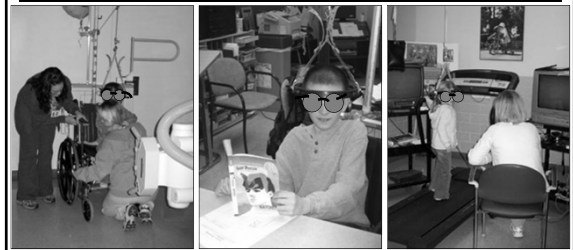
J Spinal Disord Tech. 2011;24(2):99-104

HALO TRACTION

- Perioperative halo-gravity traction in the Tx. of severe scoliosis & kyphosis. (Rinella, Lenke, et al. *Spine* 2004)
- 45 Pediatric pts. (>200 pts)
- Scoliosis±kyphosis >90°
- Sugrue, Lenke et al: Halo-Gravity Traction in Early Onset Spine Deformity: Results in **43 Consecutive Pts. SRS 2014**
- Ventura et al ICEOS 2014

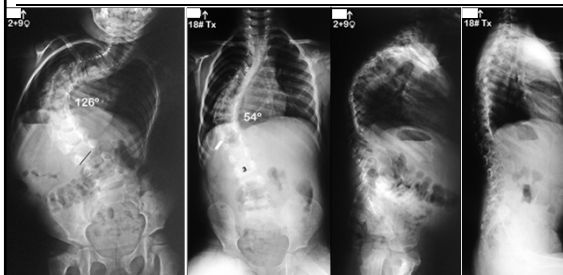


STANDARD PROTOCOL



Includes wheelchair, daily activities and treadmill as well as at night/Typically lasting for 4-6 weeks/or Longer (11 months longest!)

8Kg. HGTx For 6 Weeks



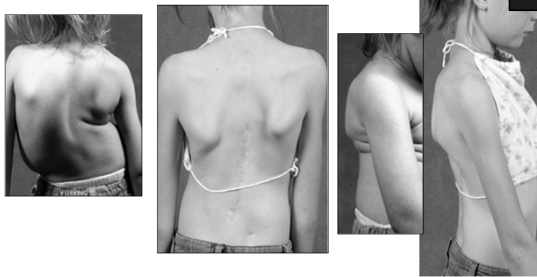
55% CORRECTION

END FUSIONS & GR

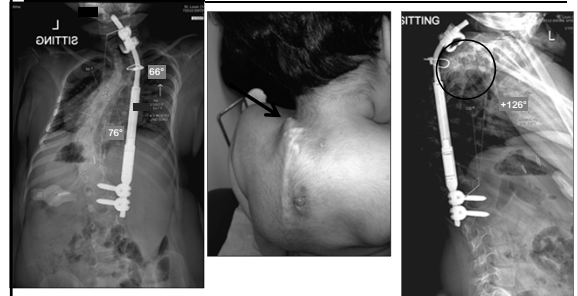


5 YEARS POST GR INSERTION/7 LENGTHENINGS

PRE & 5 Yrs POSTOP



INFANTILE ONSET IDIOPATHIC KYPHOSCOLIOSIS



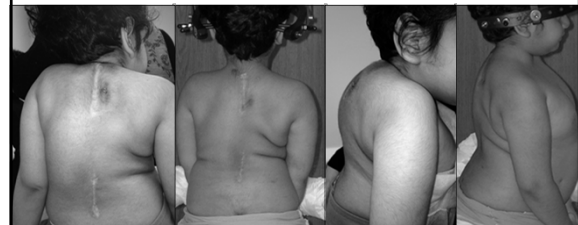
PROXIMAL IMPLANT TENTING

15# PREOP HALO-GRAVITY Tx

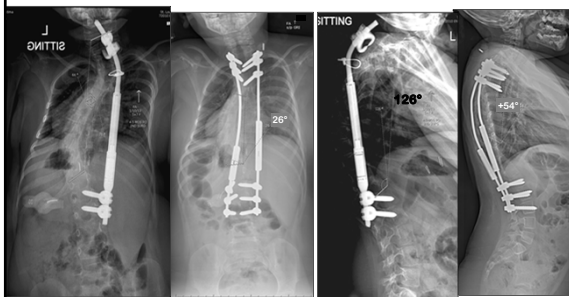


4 WEEKS OF HGTx AFTER IMPLANT REMOVAL

PRE & HGT CLINICAL PHOTOS



GR PLACEMENT AND GRL



1 YEAR POSTOP

PRE & POST CLINICAL PHOTOS



HALO-GRAVITY TRACTION IMPROVES KYPHOSIS CORRECTION FOR THOSE EARLY ONSET SCLIOSIS PATIENTS UNDERGOING GROWING SPINE TECHNIQUES

Cohort Comparison of 15 EOS pts. Treated with Preliminary HGTx vs. 15 EOS pts without HGTx

The 2 groups did not differ in any Preop Xray parameter

Pts. Who underwent Prelim HGTx. Had Statistically improved Total Thoracic Kyphosis (42 deg vs. 55 deg) and T5-T12 Kyphosis (27 deg vs 33 deg) vs. those without Prelim. HGTx. Following application of their Growing device

No Complications attributed to HGTx noted

Sugrue, Lenke et al
IMAST 2014

SEVERE CONGENITAL THORACIC LORDOSCOLIOSIS



"ILIAC-AXILLARY" DEFORMITY

PREOP CLINICAL PHOTOS

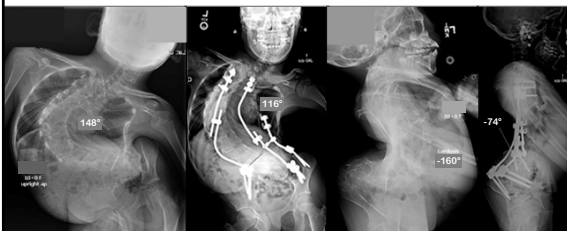


7 MOS HALO-GRAVITY Tx



TETHERED CORD RELEASE WITH HALO APPLICATION

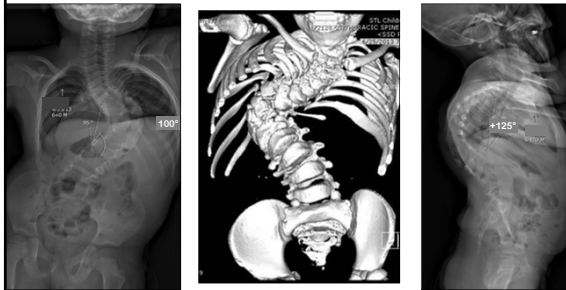
S/P GRL x3



PRE & POST CLINICAL PHOTOS



CONGENITAL KS AGE 6

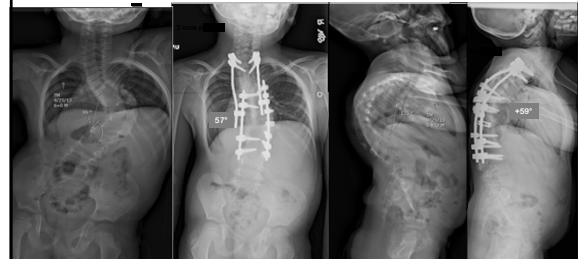


S/P TETHERED CORD RELEASE

6 WKS HALO-GRAVITY Tx



T12 VCR/GR T1-L3



PRE & POSTOP CLINICAL PHOTOS



TAKE HOME MESSAGES

- Use of VCR in EOS is a Viable Option for Severe Angular Deformities +/- Myelopathy, Those Circumferentially Fused, and for Salvage Procedures
- Consider HGTx for Preop Correction of Severe EOS Deformities as a potential means to Avoid a VCR, and in Preparation for a Growth Modulation Technique
- Use of VCR along with Growth Modulation is viable but unusual Technique at our center

THANK YOU!

Washington University Medical Center



St. Louis Children's Hospital



Center for Advanced Medicine



Barnes-Jewish Hospital



www.spinal-deformity-surgeon.com