

P19. Preoperative Halo-Gravity Traction for Severe Spinal Deformities at an SRS-GOP Site in West Africa: Protocols, Complications and Results

Venu M. Nemani, MD, PhD¹, Benjamin T. Bjerke-Kroll, MD, MS², Mitsuru Yagi, MD, PhD³, Cristina Sacramento-Dominguez, MD, PhD⁴, Harry Akoto, MD⁵, Munish C. Gupta, MD⁶, W. Fred Hess, MD⁷, Elias C. Papadopoulos, MD⁸, Francisco J. Perez-Grueso, MD⁹, Ferran Pellise, MD, PhD¹⁰, Bettye A. Wright, PA, RN², Irene Wulff¹¹, Han Jo Kim, MD², Jennifer Ayamga¹¹, Rufai Mahmud¹¹, Oheneba Boachie-Adjei, MD²; ¹New York, NY, US; ²Hospital for Special Surgery, New York, NY, US; ³National Hospital Organization Murayama Medical Center, Tokyo, Japan; ⁴Hospital Ruber Internacional, Mirasierra, Spain; ⁵Korle Bu Teaching Hospital, Accra, Ghana; ⁶University of California Davis Orthopaedic Surgery, Sacramento, CA, US; ⁷Danville, PA, US; ⁸University of Athens School of Medicine, Athens, Greece; ⁹H. De La Paz, Madrid, Spain; ¹⁰Barcelona, Spain; ¹¹FOCOS Orthopaedic Hospital, Accra, Ghana

BACKGROUND CONTEXT: Three-column osteotomies are frequently used in the correction of severe spinal deformities. However, these can be associated with high complication rates and significant risk for neurologic injury. Preoperative traction is one modality that has been used by surgeons to obtain a partial correction prior to definitive fusion. Low numbers and variability of traction protocols, however, have limited previous reports of outcomes of sustained preoperative traction.

PURPOSE: We describe a novel halo-gravity traction (HGT) protocol for patients with severe spinal deformities in West Africa, and assess the clinical and radiographic outcomes.

STUDY DESIGN/SETTING: Retrospective case series.

PATIENT SAMPLE: 29 consecutive pediatric patients with severe spinal deformity.

OUTCOME MEASURES: Radiographic measurements and SRS-22 scores obtained pre-traction, post-traction, and 6 weeks postoperatively.

METHODS: All patients who underwent HGT prior to deformity surgery in Ghana from 4/2012 to 8/2013 were reviewed. HGT was started at 20% and increased by 10% per week until 50% of body weight was reached by 4 weeks. Traction was maintained in a wheelchair, walker and in bed except for meals and personal hygiene. Xrays were obtained pre-traction, every 4 weeks in traction, and at 6 weeks post-op. Demographic variables, operative data, radiographic parameters, and HRQL scores were collected. A deformity reduction index (DRI) was calculated at each time point by summing the scoliosis and abnormal kyphosis for each patient and reported as a percentage of the preoperative deformity.

RESULTS: 29 patients underwent HGT for an average 107 days (range 58-179) prior to definitive posterior spinal fusion (24 patients) or placement of growing rods (5 patients). The major curve improved from 131° to 90° (31%) after HGT, and to 57° (56%) postoperatively. HGT was equally effective in correcting both scoliosis and kyphosis in patients with biplanar deformities, even after adjusting for curve flexibility. Pure kyphotic curves were rigid (flexibility 22% after traction), with a correction index (% postop curve correction/% flexibility) of 3.88, which is similar to historical controls (Lenke et al, Spine, 2009). Deformity correction with HGT plateaued at 63 days. SRS-22 scores improved significantly pre-traction (3.5) versus postop (4.5), but there was no change post-traction (3.9) versus pretraction (3.5). There were 11 pin tract infections, with no neurological complications.

CONCLUSIONS: Halo-gravity traction is a safe method to partially correct severe spinal deformities prior to a definitive procedure. It may obviate the need for higher risk 3-column osteotomies to achieve optimum correction. A prospective study is underway to determine which specific curve types are most amenable to preoperative traction.

FDA DEVICE/DRUG STATUS: This abstract does not discuss or include any applicable devices or drugs.

<http://dx.doi.org/10.1016/j.spinee.2014.08.273>

P20. Is KIVA Implant Advantageous to Balloon Kyphoplasty in Treating Osteolytic Metastasis to the Spine? Comparison of Two Percutaneous MIS Techniques: A Prospective Randomized Controlled Short-Term Study

Panagiotis Korovessis, MD, PhD, Konstantinos Vardakastanis, MSc, Vasilios Vitsas, MD, Vasilios Syrimepis, MD; Patras, Greece

BACKGROUND CONTEXT: Minimally invasively vertebral augmentation techniques with PMMA, are mostly performed for treating osteoporotic compression fractures. The KIVA implant with PMMA offers better vertebral body restoration and less PMMA leakage than BK in osteoporotic fractures. No previous study compared leakage rate and efficacy for vertebral body restoration in traditional BK and KIVA with PMMA in osteolytic vertebral body metastases.

PURPOSE: To compare cement leakage rate and efficacy for vertebral body restoration of balloon kyphoplasty (BK) versus KIVA novel implant with PMMA for treating osteolytic vertebral body metastasis.

STUDY DESIGN/SETTING: Prospective, parallel-group, controlled comparative randomized study.

PATIENT SAMPLE: This study examined 23 patients (71±13 years) with 41 osteolytic vertebral bodies.

OUTCOME MEASURES: AVBhr, PVBhr, MVBhr, Gardner angle, PMMA leakage

METHODS: This study examined 23 patients (71±13 years) with 41 osteolytic vertebral bodies, who received KIVA with low viscosity PMMA and 24 patients (70±11 years) with 43 vertebral body osteolyses, who were reinforced with BK and high viscosity PMMA. All osteolyses were grades as Tomita 1 to 3. Anterior (AVBhr), posterior (PVBhr), and middle vertebral body height ratio (MVBhr), Gardner kyphotic deformity, PMMA leakage and were measured and compared between the groups. VAS and ODI were used for functional outcome evaluation.

RESULTS: No patient survived after 3 months. Asymptomatic PMMA leakage occurred in 4 (9.3%) vertebrae in the BK group solely (2 to the spinal canal, in Tomita grade 3 osteolysis). AVBhr, PVBhr and MVBhr and Gardner angle improved insignificantly similarly, in both groups. VAS and ODI improved postoperatively in both groups (P<0.001).

CONCLUSIONS: BK and KIVA provided equally significant spinal pain relief in cancer patients with osteolytic metastasis. The absence of cement leakage in the KIVA group and absence of neurological complication in BK leakages reflects the safety of both augmentation techniques even in significant osteolysis. The lack of cement leakage in the KIVA cases, although low viscosity PMMA was used, increases this implant safety in augmenting severely destructed thoracolumbar vertebrae and sacrum from osteolytic metastasis.

FDA DEVICE/DRUG STATUS: KIVA VCF (Investigational/Not approved)

<http://dx.doi.org/10.1016/j.spinee.2014.08.274>

P21. Minimally Invasive Surgical Treatment of Spinal Metastases

Arthur L. Jenkins, III, MD; Mt. Sinai School of Medicine, New York, NY, US

BACKGROUND CONTEXT: Some say, “There’s no place in spinal tumor surgery for minimally invasive approaches.” Minimally invasive approaches can reduce morbidity, mitigate instability by avoiding removal of structures providing stability but result in removal of tumor causing compression, allow for correction of deformity, and provide lasting benefit for the patient without large incisions, use of extensive spinal instrumentation (which also degrades postoperative imaging), and high-blood-loss procedures that can result in significant morbidity and even mortality.

PURPOSE: Our series of patients with symptomatic metastatic spinal compression (MESCC) treated with minimally invasive spinal (MIS)