P79. Establishment of a Thoracic Torg Ratio to Predict Congenital Thoracic Stenosis: A Study of 620 Postmortem Subjects

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BACKGROUND CONTEXT: The cervical Torg ratio has been used as a screening tool in determining the presence of congenital cervical stenosis. However, no studies have defined Torg ratio in thoracic spine for predicting congenital thoracic stenosis (CTS).

PURPOSE: The aim of this study is to provide an analysis of thoracic Torg ratio in predicting congenital thoracic stenosis based on objective measurements of a large sample of skeletal specimens.

STUDY DESIGN/SETTING: A retrospective cadaveric analysis of thoracic spine.

PATIENT SAMPLE: 620.

METHODS: 620 adult skeletal specimens from the Hamann Todd Collection in the Cleveland Museum of Natural History were selected. Calipers were used to measure sagittal canal diameter (scd), interpedicular distance, pedicle length and vertebral body diameter (vbd). Canal area was also calculated using a geometric formula. A standard distribution curve for canal area and Torg ratio was created and values that were 2 standard deviations (2SD) below mean were considered as being congenitally stenotic. Regression analyses were performed to determine if the Torg ratio was associated with canal area, and if low Torg ratio was predictive of thoracic stenosis.

RESULTS: Torg ratio <2SD was defined at T1 = 0.68, T2 = 0.63, T3 = 0.57, T4 = 0.53, T5 = 0.49, T6 = 0.44, T7 = 0.44, T8 = 0.41, T9 = 0.41, T10 = 0.40, T11 = 0.41, T12 = 0.42. Torg ratio below 2SD predicted canal stenosis at all thoracic levels (p<0.01) except T8 and T11 (p=0.08) with a sensitivity of 37% and specificity of 90%. Alternatively using Torg ratio <0.8 for T1 to T3 and <0.6 for T4 to T12 levels predicted stenosis with a sensitivity of 82% to 99% and specificity of 6 to 30%.

CONCLUSIONS: Torg ratios <2SD predict CTS with high specificity but low sensitivity. Alternately, the Torg ratio of <0.8 and <0.6 for upper and lower thoracic levels respectively yielded higher sensitivity and thus can be a useful radiological tool for screening of CTS.

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

http://dx.doi.org/10.1016/j.spinee.2013.07.352

P80. A Therapeutic Efficacy of the Transpedicular Intracorporeal Bone Graft with Short-Segmental Posterior Instrumentation in Osteonecrosis of Vertebral Body: A Minimum Five-Year Follow-Up Study

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BACKGROUND CONTEXT: Although a broad spectrum of surgical options have been described for the treatment of ONV without neurologic deficits, no effective treatment has been definitely established. Limited previous work has reported favorable outcomes with intracorporeal bone graft (IBG), however, these studies were limited by short-term follow-up and small sample sizes. This study is the first to report the clinical and radiological results of IBG with short-segmental posterior instrumentation in ONV with a 5-year follow-up period.

PURPOSE: The purpose of this study was to investigate the therapeutic efficacy of transpedicular intracorporeal bone graft in osteonecrosis of vertebral body (ONV) for 5-years follow-up period.

STUDY DESIGN/SETTING: A retrospective case series.

PATIENT SAMPLE: This study was approved by our institutional review board. This was a retrospective study regarding clinical and radiological outcomes following transpedicular intracorporeal bone graft with short-segmental posterior instrumentation (TIBG). Between January 2001 to June 2006, 36 patients with persistent pain diagnosed as ONV underwent this procedure. Diagnostic criteria for ONV was (1) definite findings of intervertebral cleft or vacuum phenomenon or gas, air sign in the sagittal and coronal reconstructive CT scans and/or lateral radiographs, which was confirmed by three radiologists, and (2) the patients who have a symptom and/or sign compatible with the ONV lesion such as tenderness around the lesion and aggravating pain at the back motion of flexion and extension, which was confirmed by two spine fellows who was not participated in this study. All operations were performed by one surgeon (the corresponding author).

OUTCOME MEASURES: Clinical data and radiological data were retrospectively collected from medical records. Following surgery, an assessment was performed at regular intervals: immediately after surgery, then at three months, six months, one year and annually thereafter. A visual analog scale (VAS) and the Oswestry Disability Index (ODI) were used to assess pain severity. AP and lateral radiographs were taken at each follow-up appointment. Special attention was paid to the presence of grafted bone resorption and vertebral body bone healing. Morphological changes of the vertebral bodies such as collapse were analyzed in the serial follow-up plain radiographs. The anterior and posterior heights of the involved vertebrae were assessed to calculate the compression ratio (anterior/posterior height; anterior/posterior ratio) before and after surgery. The kyphotic angle was measured as the angle between the lower endplate of the upper vertebral body and the lower endplate of the affected vertebral body. The vertebral height was measured using the method described by McKiernan et al. Bone union was defined as (1) having obvious bridging trabeculae and bone formation without cleft or vacuum sign in the sagittal and coronal reconstruction CT scan images and/or lateral radiographs, as well as (2) no intra-segmental and inter-segmental motion or detectable motion of less than 3mm of on flexion-extension lateral radiographs. The degree of compression progression of the treated level, which is the compression ratio difference between the immediate postoperative measurement and the follow-up period measurements, was calculated for all patients. The difference between compression ratios measured at 12 months and 5 years after the surgery was calculated as well. We compared each the compression ratio differences. All heights and angles were measured using the Picture Archiving and Communication System and its computer software (PiViewSTAR 5.0, INFINITT, Seoul, Korea).

METHODS: Thirty-six patients were followed for at least 5 years following transpedicular IBG with short-segmental posterior instrumentation. We
P81. Preoperative Narcotic Use Predicts Worse Postoperative Self-Reported Outcomes in Patients undergoing Spine Surgery

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**BACKGROUND CONTEXT:** Narcotics remain a common agent class used for the management of pain in patients being evaluated for spine surgery. Recent national attention has highlighted the negative effects of narcotics in this and other non-malignant pain settings. Previous work suggests that increased preoperative narcotic use has a negative impact on spine surgery outcomes.

**PURPOSE:** We aim to assess whether preoperative narcotic use predicts worse self-reported outcomes in patients undergoing spine surgery.

**STUDY DESIGN/SETTING:** Prospective cohort study.

**PATIENT SAMPLE:** 583 patients evaluated and treated for lumbar, thoracolumbar, or cervical lesions from October 2010 to June 2012 at a single institution.

**OUTCOME MEASURES:** Patient reported outcome measures were assessed via 12 Item Short-Form Health Survey (SF-12) scores for general overall physical health, EuroQol-5D (EQ5D) scores for health-related quality of life, as well as Oswestry/Neck Disability Index (ODI/NDI) scores for disability.

**METHODS:** 583 patients undergoing lumbar (60%), thoracolumbar (11%), or cervical spine (29%) surgery for a structural lesion were included. Self-reported preoperative narcotic consumption was obtained at the initial preoperative visit and converted to the corresponding daily morphine equivalent amount (MEA). Preoperative baseline, 3-month postoperative, and 12-month postoperative SF-12, ODI/NDI, and EQ5D scores were assessed for all patients. ODI and NDI scores were combined into a single outcome variable to include both cervical and lumbar patients in simultaneous analyses. Separate multivariable linear regression analyses were then used to determine whether preoperative narcotic use predicted postoperative SF-12, EQ5D, and ODI/NDI scores.

**RESULTS:** Univariate analyses revealed that SF-12 physical health scores were significantly improved at both 3 and 12-month follow-up (39.6±11.4 at 3 months, 39.0±13.2 at 12 months, compared to 29.2±9.6 preoperatively, p<0.001), as were EQ5D scores (0.75±0.22 at 3 months, 0.73±0.22 at 12 months, compared to 0.54±0.21 preoperatively, p<0.001). ODI/NDI scores were also significantly improved at both follow-up visits (28.7±19.6 at 3 months, 28.4±20.9 at 12 months, compared to 49.2±18.0 preoperatively, p<0.001). Separate longitudinal multivariable analyses controlling for age, gender, diabetes, smoking, anatomic location, preoperative Modified Somatic Perception Questionnaire (MSQ) score, preoperative depression, primary vs revision surgery, and baseline score of the outcome variable found that preoperative narcotic use was a significant predictor of decreased postoperative SF-12 and EQ5D scores and increased ODI/NDI scores. Specifically, every 1mg MEA taken preoperatively was associated with a 0.02 decrease in the SF-12 physical health score, a 0.001 decrease in the EQ5D score, and a 0.05 increase in the ODI/NDI score (p<0.001) postoperatively. All models were examined for the random effect of performing surgeon and found not to be significant, even when directly controlling for this variable.

**CONCLUSIONS:** Our work suggests that increased preoperative narcotic consumption prior to undertaking spine surgery for a structural lesion predicts worse patient reported outcomes. Future work should focus on the association of preoperative narcotic use and other outcome measures. Such information may help facilitate discussion between surgeon and patient regarding expectations prior to proceeding with surgery.

**FDA DEVICE/DRUG STATUS:** Narcotics/opioids (Approved for this indication).

http://dx.doi.org/10.1016/j.spinee.2013.07.354

P82. Preoperative Narcotic Use and its Relation to Anxiety, Depression and Payer Status in Patients Undergoing Spine Surgery

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**BACKGROUND CONTEXT:** Narcotics remain a common agent class used for the management of pain in patients being evaluated for spine surgery. Recent national attention has highlighted the negative effects of narcotics in this and other non-malignant pain settings. Previous work suggests narcotic use and psychiatric comorbidities are intimately related. Among other psychosocial considerations, anxiety level, depression, and payer status may be associated with the amount of preoperative narcotic use in patients undergoing spine surgery.

**PURPOSE:** We aim to assess whether the amount of preoperative narcotic use is associated with preoperative anxiety level, depression, and payer status in patients undergoing spine surgery for a structural lesion.

**STUDY DESIGN/SETTING:** Prospective cohort study.

**PATIENT SAMPLE:** 583 patients evaluated and treated for lumbar, thoracolumbar, or cervical structural lesions from October 2010 to June 2012 at a single institution.

**OUTCOME MEASURES:** Daily morphine equivalent amount (MEA) consumption as assessed at the initial preoperative visit for patients undergoing spine surgery.

**METHODS:** 583 patients undergoing lumbar (60%), thoracolumbar (11%), or cervical spine (29%) surgery for a structural lesion were included. Self-reported preoperative narcotic consumption was obtained at the initial preoperative visit and converted to the corresponding daily morphine equivalent amount (MEA). Preoperative Zung Depression Scale (ZDS) and Modified Somatic Perception Questionnaire (MSQ) scores were also obtained at the initial preoperative visit and recorded as measures of depression and anxiety, respectively. Payer status was recorded as either federal Medicare/Medicaid, private, state Medicaid, uninsured/indigent, or Veterans Affairs/government. Linear regression analysis was performed including other clinically and psychosocially important covariates. These included age, gender, type of surgery, smoking status, and preoperative employment status.

Refer to onsite Annual Meeting presentations and postmeeting proceedings for possible referenced figures and tables. Authors are responsible for accurately reporting disclosures and FDA device/drug status at time of abstract submission.