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GREATER TROCHANTERIC OSTEOPLASTY IN REVISION HIP ARTHROPLASTY, David E. Attarian, MD and Michael P. Bolognesi, MD, Duke Medical Center, Durham, North Carolina

Revision hip arthroplasty when the greater trochanter has migrated proximally can be challenging, particularly in regard to surgical exposure of the joint, re-establishing leg length, avoiding postoperative impingement/ instability, and achieving a functional hip with less pain and greater motion. Often, the surgical solution to these problems has included greater trochanteric and/or subtrochanteric osteotomy. This report describes two cases that were treated with greater trochanteric osteoplasty (reshaping and partial resection of the greater trochanteric tip) through a modified direct lateral approach; this novel alternative surgical technique accomplishes the procedural goals without major osteotomy and the potential associated complications. Both patients were very satisfied with their outcome.

COMPARISON BETWEEN GEARSHIFT AND DRILL TECHNIQUES FOR PEDICLE SCREW PLACEMENT BY RESIDENT SURGEONS, Vikram Jadhav[1] MD, PhD; Jon Allen[1] MD; Ali Murad[2] MD, Jan Eckermann[2] MD, Justin Spooler[2] MD, Adeel Husain[1] MD, Ray Grijalva[1] MD, Farbod Asgarzadie[2] MD, Shyam Kishan[1] MD, Tim Peppers[1] MD, Wayne Cheng[1] MD, Loma Linda University School of Medicine, Loma Linda, California

Introduction: This was a cadaveric study to evaluate the accuracy of pedicle screw placement in the thoracolumbosacral spine by resident surgeons. Two popular techniques, namely, gearshift versus drill were compared.

Methods: Six resident surgeons with no prior experience using drill and limited skills with gearshift technique for pedicle screw placement instrumented the thoracolumbosacral spine pedicles (T1-T12, L1-L5, and S1) using the aforementioned methods. Residents were each assigned one cadaver and each vertebra was instrumented by gearshift and drill techniques by random assignment of the right and left pedicles. There was no imaging guidance during the procedure, however, residents were provided with anteroposterior and lateral full length radiographs of their respective cadavers to familiarize with existing spinal deformities. Violations

(medial, lateral, anterior, superior and inferior) were recorded by studying the computerized tomographic scans of instrumented cadavers by a blinded observer. Critical perforations were defined as greater than 2mm breach of the pedicle wall.

Results: A total of 100 vertebrae (200 pedicles) were available for instrumentation in the six cadavers after excluding previous procedures and instrumentation. 111 pedicles were breached (55.5% of total pedicles) with a total of 131 violations. Lateral violations were the most encountered (48% of violations, 63 total, 49 critical, 14 noncritical) followed by medial (19%, 25 total, 13 critical, 12 noncritical) and the rest were anterior (5%), superior (12%) and inferior (15%). There was no overall difference in violations comparing the gearshift technique (53%, 70 total, 48 critical, 22 noncritical) with drill technique (47%, 61 total, 40 critical, 21 critical). There was no difference in the violations with regards to level of experience and skill of the residents. Analyzing the breaches at individual vertebrae indicated most violations at T6 (14) followed by T5 (13), T4 (12) and T3 (12) decreasing towards the lumbosacral vertebrae.

Conclusions: The results of this study suggest that the gearshift and drill techniques fare similarly when applied by resident surgeons for placement of pedicle screws in thoracolumbosacral spine. Most violations were encountered at thoracic vertebrae with narrow pedicles (T6 and vicinity).

CLINICAL CORRELATION OF MAGNETIC RESONANCE IMAGING FINDINGS IN BRAIN AND CERVICAL SINE AND THE HOFFMANN'S SIGN, Vikram Jadhav[1], MD, PhD; Frank P.K. Hsu[2], MD, PhD; Bryan E. Tsao[3], MD; Wayne K. Cheng[1], MD, Loma Linda University School of Medicine, Loma Linda, California

Introduction: The positive Hoffmann's sign is routinely used in clinical practice as an indicator of cervical spine disease. There is however, no literature to compare the Hoffmann's sign with magnetic resonance imaging (MRI) findings in the brain. Therefore, this retrospective study was designed to assess relationship between the positive Hoffmann's sign and MRI findings in the brain and cervical spine.

Methods: This was a retrospective analysis of all patients in the practice of a university based spinal orthopedic surgeon over two years from Apr, 2007 – June, 2009. The Hoffmann's test was performed on all patients by one surgeon as a part of standard physical examination. Brain and spine MRI were interpreted for brain pathology and cord compression respectively by investigators blinded to the patient history and clinical findings. Cord compression was defined as anterior and posterior CSF effacement with less than 8mm canal AP diameter, abnormal contouring of the spine and cord density changes.

Results: 95 out of 1717 new patients (5.5%) over a two year period had a positive Hoffmann's sign. Further clinical workup in the patients with positive Hoffmann's sign necessitated cervical spine MRI in 58 patients and head MRI in 27 patients. 15 patients had cord compression, 1 had syrinx and 5 patients had pathological findings in the brain on the MRI.

The positive predictive value (PPV) was 28% and 19% for cord pathologies and brain lesions respectively.
Conclusions: The Hoffmann's sign is not a reliable parameter to predict the presence of cervical spinal cord compression and brain lesions. There was a 5.5% incidence of positive Hoffmann's sign in new patients presenting with neck and back pain complaints.

A COMPARISON OF C1-C2 TRANSARTICULAR SCREW PLACEMENT AFTER SELF-EDUCATION AND MENTORED EDUCATION OF ORTHOPAEDIC RESIDENTS, John S. Kirkpatrick, MD, University of Florida College of Medicine, Jacksonville, Florida
INTRODUCTION: Self directed learning is an essential competency in ACGME accredited residencies. This may include independent study or identification of courses desired. Residency training does not often provide opportunity to specifically train in new and technically difficult techniques. This study will provide preliminary data on whether residents can be "self taught" and to what extent a lecture, demonstration, and coaching can improve skills and knowledge.
METHODS: A written test was given to orthopaedic residents on C1-C2 transarticular screw placement. They were then provided reading on C1-C2 transarticular screw placement. Residents were then divided in half into a "self directed learning" group and a "mentored learning" group. Those in the mentored learning group received the benefit of a lecture. All residents then performed the technique on models, with the "mentored" group receiving coaching from the mentor. The models were analyzed for technique errors and the previous test was administered again as a post-test. 6 months after the initial screw placement in models, a second attempt was made at placing screws and the models again analyzed.
RESULTS: 14 residents participated, 6 randomized to the non-mentored group and 8 to the mentored group. Residents without mentoring had an average improvement of 4.5 points, those with mentoring improved by an average of 8.5 points ($p=0.0068$). Each screw placement was evaluated in 2 anatomic structures for errors in technique (4 potential errors per spine): penetration of the C2 isthmus and over penetration or missing of C1. The screw placement technique error rate for the non-mentored group was 2.63, and for the mentored group was 1.1 ($p=0.004$). Nine residents were able to repeat the screw placement technique 4 months after the initial test and screw placement, 3 non-mentored and 6 mentored. The non-mentored group had an average mean error rate of 2.33 and the mentored group average error rate was 2.0.
CONCLUSION: This preliminary trial seems to indicate that residents provided a lecture and guided technical instruction will obtain knowledge and perform procedures better than those that do not. If this finding is applicable to surgeons as well as residents, then independent study may not yield meaningful results as part of practice based learning and improvement. Conclusions based upon PGY year, motivation, and interest in spine surgery could not be made.

OSTEOLYSIS IN LUMBAR INTERBODY FUSIONS, Richard J. Nasca MD, Wilmington, North Carolina

Background: Patients present with intense back and radicular pain 1-3 months following a lumbar interbody fusion in which recombinant human bone morphogenetic protein-2 (rhBMP-2) was used. RhBMP-2 was approved for use in anterior interbody fusions with metal cages by the FDA in 2002.

Methods: 4.2 mg of rhBMP-2, (Medtronic, Memphis, TN) was placed on 2 to 4 collagen sponges for use in most applications. Axial, posterior and transforaminal interbody fusion approaches and techniques of disc removal and end plate preparation were used.

Results: In patients affected with osteolysis, CT scans showed areas of bone destruction and resorption. MRI scans showed areas of edema, inflammatory response and fluid filled cysts. Lytic areas may extend across the vertebral end plate if perforated. Fluid filled cysts may tract into the spinal and neural canals. Large areas of edema may surround the interbody implants. Workup for infection was negative. The cases that have been re-operated show mixed inflammatory and osteoclastic response followed by new bone formation.

Discussion: Osteolysis was seen with all types of interbody implants. The exact cause of vertebral osteolysis is not proven but thought to be an allergic or idiosyncratic reaction to rhBMR-2 and or the collagen carrier.

Conclusion: No further surgery is recommended since in most cases the osteolysis is self limited and the patients symptoms resolve. Osteolysis is a potential adverse effect in patients in whom rhBMP-2 is used to promote lumbar interbody fusion.

IN THE MIDST OF EVIL, Wend Schaefer, Incline Village, Nevada.

A trip was made to Bukoba, Tanzania in October-November of 2009 to provide volunteer orthopaedic consultations and orthopaedic surgery to the people of that area. A visit to the Mugeza school for handicapped children was accomplished. Twenty-five albino children had been gathered there for protection from murderers who where killing the albinos for their body parts which were being used in witchcraft. Two of the children had experienced amputations, one of both hands. The staff of the school lacked knowledge of how to protect the children from the sun. The children suffered from severe sunburn and progressive blindness. The children were provided with safari hats, long sleeve clothing and long pants and dresses, protective glasses and protective lotions. The school staff was instructed in the methods of protection for the albinos.

SALVAGING THE FAILED ULNAR NERVE DECOMPRESSION, Aaron I. Venouziou, Zinon T. Kokkalis, Dean G. Sotereanos, Alleghany Orthopedics Association, Pittsburgh, Pennsylvania.

Recurrent compression of the ulnar nerve in the cubital tunnel represents a challenge for the upper extremity surgeon. Recurrence is often secondary to cicatrix, or scar tissue, that develops around the nerve at the site of decompression. These patients have often undergone

multiple decompressions consisting of mobilization of the nerve, followed by internal neurolysis.

Medial epicondylectomy, with or without submuscular transposition, can be done to supplement the decompression at the initial revision. Osteotomy of the medial epicondyle allows for subluxation of the nerve anteriorly, out of the bed scarring. In addition, epicondylectomy eliminates the traction forces imparted on the ulnar nerve, by the medial epicondyle, by allowing the nerve to move anterior to the axis of elbow motion.

However, in the case of the failed revision ulnar nerve decompression, there is a general agreement that the application of a scar-tissue barrier would improve chances for a successful outcome. Several options have been tried with varied success, including fascial, fasciocutaneous, island or free-flap coverage or our preferred technique using a vein graft.

The vein graft has the advantages of being simpler than the complex technical demands of flap coverage. Moreover, histologic studies showed that the vein graft was able to adequately cover and insulate the entire portion of the nerve, where external or internal neurolysis had been performed, and helped prevent cicatrix from reforming. Up to date, all patients, who have been treated with a vein wrap, have reported significant pain relief, while improvements in grip strength and 2-point discrimination have also been observed. No complications have been noted, other than transient leg swelling secondary to harvesting the saphenous vein graft from the leg. In conclusion, results of using saphenous vein grafts in cases of recurrent cubital tunnel syndrome have been encouraging. The use of autologous vein graft wrapping technique is recommended mainly for treatment of recalcitrant ulnar nerve compression at the elbow in which two or more previous surgical procedures have failed to resolve the problem.

2010 HEALTH REFORM, Robert S. Mathews, M.D., First Team Institute, LLC, Lancaster, Pennsylvania.

Seven score and 10 years ago we embarked on health care reform in this great democracy in a step wise process:

- 1860 Civil War medical care followed by veteran care
- 1911-1915 Workman's Compensation
- 1935 Social Security followed by
- 1965 Medicare and Medicaid
- 1993 Medicare fee control for physicians and providers

Now 2010 health care reform for everyone so the government can create enough political support to tackle out of control costs.

The combined House and Senate Bills generally say "all health care would work "about" like it is today."

Mr. Obama wishes to change the "pattern of health care access and delivery."

R. Fisher CEO of the Federal Reserve Bank of Dallas, Texas says that President Obama's "IMAC" would be a "private public system wide cost control system or Federal Reserve Health Bank."

This option would control spending across both the public and private insurance pools. Other countries that have multiple insurers, such as Germany, Japan, and the Netherlands, use all-payer regulation to control costs. In these countries, insurers come together to negotiate, or the government takes the lead in setting common payment rules for medical care. With few exceptions, payments to all providers in a given geographic area follow a standard fee schedule. Hospitals are also paid on comparable terms.

WHY?

- Prices are significantly lower
- Reduces cost shifting
- Simplifies billing
- Public-private insurances co-exist
- Slows rising business premiums
- Reduces provider administrative overhead
- Public-private "win-win" for all people

A PREDICTIVE MODEL OF SHOULDER INSTABILITY AFTER A FIRST TIME ANTERIOR SHOULDER DISLOCATION, Richard C. Mather III, MD*, Lori A. Orlando, MD, MHS†, MHS, Robert D. Henderson, BA*, J. Todd R. Lawrence, MD, PhD* & Dean C. Taylor, MD*, Duke Medical Center, Durham, North Carolina.

Introduction: Management of a first-time anterior shoulder dislocation (FTASD) involves important clinical and policy decisions. Predictive disease modeling can improve the quality of information disseminated in treatment discussions. In this paper, we describe a general-purpose, publicly available model and illustrate its potential as a tool for management of a FTASD.

Methods: A Markov decision model of the natural history of a FTASD was constructed. Outcome probabilities and effectiveness were derived from the literature or estimated by expert opinion where necessary. Outcomes were the Western Ontario Shoulder Instability index (WOSI) and the probability of a patient experiencing recurrent instability, undergoing surgical stabilization and having a stable shoulder at 10 years. The model was both internally and externally validated. Specific outcomes were examined for specific cases.

Results: The model was effectively externally validated against two studies, a Swedish prospective cohort of Hovelius et al and Botonni et al's military cohort. It can produce detailed outcome predictions for individuals; for example, an 18 year-old man has a 77% risk of dislocation in year one and a 32% chance of having a stable shoulder in 10 years.

Conclusions: Detailed and specific information about prognosis is critical in the management of a FTASD. Disease modeling lends itself well to these needs and allows improved shared decision-making. Our model was externally validated and can predict specific outcomes. As a publically available resource, it will allow physicians to accurately predict the expected

outcome of a procedure based on patient demographics and their own surgical success rates.

ARE THE TRAINING WHEELS OFF?, Keith Micheal, MD, William Ogden, MD, Asheville VA Hospital, Asheville, North Carolina.

The Asheville VA rotation of the Duke Orthopaedic training program offers the "perfect storm" environment for resident education through its timing, patient population and unique resident-attending relationship. Academic centers are increasingly subspecialized, and treat a complex patient population. With limited residency work hours, academic centers provide excellent teaching opportunities, but can have difficulty providing opportunities for resident independence, which is critical for learning and development. During the Asheville rotation residents coalesce their skill set acquired at Duke by running a general orthopaedic practice under the tutelage of experienced Duke trained attendings retired from busy generalist practices who function exclusively for resident benefit. A recent survey of Duke graduates and attendings suggest this rotation has an unparalleled impact on resident growth in the areas of professionalism, clinical acumen and operative skill, greatly facilitating the transition to their own private or academic practice. This rotation should serve as a training model for all major academic programs.

REPORT OF THE PIEDMONT SCIENTIFIC COMMITTEE: 2010 SURVEY – OVER-AGGRESSIVE AND OVER-TREATMENT, David C. Urquia, MD, Augusta Orthopaedic Associates, Augusta, Maine.

The results of an on-line, confidential survey of the national Piedmont Orthopaedic Society membership was presented. A total of 115 respondents, across all Orthopaedic subspecialties, both private and academic practices sampled.

In the data, several practice demographic parameters were summarized including subspecialty, practice type, methods of professional compensation, and ancillary revenue sources.

Survey questions focused on clinical scenarios where the surgeon could choose among treatment options that reflected aggressive or less-aggressive/conservative approaches.

Results of the survey reflected that a majority of respondents believe:

#1. Some overly-aggressive Orthopaedic practices do exist in their communities.

#2. Emergency Room personnel have become increasingly aggressive in ordering expensive musculo-skeletal diagnostic studies, some of which are unnecessary or premature in the E.R. setting for the particular clinical presentation.

Among the respondents there was wide variation in how aggressively they used MRI/CT diagnostics, and how aggressively they recommended surgeries for common procedure like TKA, knee arthroscopy, or distal radius fractures.