as patients with both a decrease in VAS of at least 3 points and ODI >20 points. A ''best case'' outcomes was defined as final VAS 0-2 and ODI <20.

RESULTS: Eighty-four patients had full complement of data (91%) and were included in this analysis. At 3-month follow-up, 68/84 (81%) were ''better''. There was a statistically significant association of the presence of FAC and clinical improvement (p=0.02) with an 88% PPV. 48/84 (57%) met the criteria for ''best case'', but only a weak association was found with the presence of FAC and a ''best case'' improvement (p=0.26). Significant variability among the four surgeons was observed in regards to the percent of patients who were FAC positive ranging from 56-89%.

CONCLUSIONS: Patients who are ''FAC+'' are more likely to get ''better'' following microdiscectomy. However, other factors appear to be involved in those who do ''best'', possibly ''mechanical'', ''neuropathic'' or socioeconomic varibables. Variability among surgeons and the presence of FAC may be due to differences in practice profiles.

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

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Friday, October 26, 2012
3:05 – 3:35 PM
Value Abstract Awards Presentations

22. Accurately Measuring the Quality and Effectiveness of Lumbar Surgery in Registry Efforts: Determining the Most Valid and Responsive Instruments

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BACKGROUND CONTEXT: There is a growing demand to measure the real-world effectiveness and value of care across all specialties and disease states. Prospective registries have emerged as a feasible way to capture real-world care across large patient populations. However, the proven validity of more robust and cumbersome patient reported outcomes instruments (PROi) must be balanced with what is feasible to apply to large-scale registry efforts. Hence commercial registry efforts that measure quality and effectiveness of care in an attempt to guide quality improvement, pay-for-performance, or value-based purchasing have incorporated simpler, more feasible outcomes measures yet to be validated in a registry setting.

PURPOSE: We set out to determine the relative validity and responsiveness of common PROi in accurately determining effectiveness of lumbar fusion for degenerative lumbar spondylolisthesis in registry efforts.

STUDY DESIGN/SETTING: Prospective cohort study.

PATIENT SAMPLE: Fifty-eight patients undergoing primary TLIF for degenerative lumbar spondylolisthesis.

OUTCOME MEASURES: VAS-BP, VAS-LP, ODI, SF-12 PCS, SF-12 MCS, Zung Depression Scale (ZDS), EQ-5D and patient satisfaction.

METHODS: Fifty-eight patients undergoing primary TLIF for degenerative lumbar spondylolisthesis were entered into an institutional registry and prospectively followed for two years. Baseline and two-year patient-reported outcomes [VAS-BP, VAS-LP, ODI, SF-12 PCS, SF-12 MCS, Zung Depression Scale (ZDS) and EQ-5D] were assessed. Patients were also asked whether they experienced a level of improvement after lumbar fusion that met their expectation (meaningful effectiveness). In order to assess 1) the validity of VAS-BP, VAS-LP and ODI to discriminate between effective and non-effective improvements in pain and disability, and 2) the validity of SF-12, Zung depression scale, and EQ5D to discriminate between effective and non-effective improvements in general health and quality of life (QOL), receiver operating characteristic (ROC) curves were generated for each outcomes instrument. Area under the curves (AUC) >0.80 was considered an accurate discriminator. The difference between standardized response means (SRM) in patients reporting meaningful improvement versus not were calculated to determine the relative responsiveness of each outcomes instrument to changes in pain and QOL after surgery.

RESULTS: For pain and disability, ODI had AUC = 0.94, suggesting it as an accurate discriminator of meaningful effectiveness. VAS-BP (AUC=0.78) and VAS-LP (AUC=0.72) were less accurate discriminators. ODI was most responsive to postoperative improvement (SRM difference: 2.18), followed by VAS-BP (SRM difference: 1.43) and VAS-LP (SRM difference: 0.93). For general health and quality of life, SF-12 PCS (AUC: 0.90), Zung (AUC: 0.89) and SF-12 MCS (AUC: 0.85) were all accurate discriminators of meaningful effectiveness, however, EQ-5D was most accurate (AUC: 0.97). EQ-5D was also most responsive (SRM difference: 2.83), followed by ZDS (SRM difference: 1.60), SF-12 MCS (SRM difference: 1.44) and SF-12 PCS (SRM difference: 1.28).

CONCLUSIONS: For pain and disability,ODI is a valid and responsive measure of effectiveness of lumbar fusion. VAS-BP and VAS-LP are poor substitutes for measuring effectiveness of care, with loss of validity and responsiveness. For health-related quality of life, EQ-5D is the most valid and responsive measure of effectiveness of lumbar fusion, however, SF-12 and Zung are valid alternatives with less responsiveness. Large scale registry efforts can utilize the more feasible 5-item EQ-5D rather than 12-item SF-12 or 18-item ZUNG, but cannot replace the 10-item ODI with the more feasible 2-item VAS LP/BP without sacrificing validity. Registry efforts using only VAS pain scales or not incorporating a health-related quality of life measure may not represent an accurate measure of effectiveness of quality of spine care.

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189. Blood Salvage Produces Higher Total Blood Product Costs in Single-Level Lumbar Spinal Surgery

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BACKGROUND CONTEXT: Intraoperative blood salvage is used to reduce the need for perioperative allogeneic blood transfusion. However, its utility has not been clearly demonstrated for adult patients undergoing single-level lumbar posterolateral fusions (PSF). Despite the lack of evidence, cell saver is frequently used during these surgeries, leading to in an increased cost.

PURPOSE: This cost minimization study aims to determine whether use of blood salvage reduces overall blood costs for single-level lumbar PSF.

STUDY DESIGN/SETTING: Retrospective review of adult patients treated with a single-level lumbar PSF between July 2010 and June 2011 at a single institution.

PATIENT SAMPLE: 285 of 578 patients who were treated with lumbar PSF were randomly chosen. Patients who had a multi-level fusion, had both an anterior and posterior approach, and whose fusion extended into the thoracic region were excluded. The final study sample included 180 patients.

OUTCOME MEASURES: Total cost for blood products was calculated based on the cost of allogeneic blood transfusion, setting up the cell saver recovery system, and infusing autologous blood from cell saver.
METHODS: Surgical records for all patients were reviewed to determine whether: (1) cell saver was available during surgery, (2) recovered autologous blood was infused and (3) any intra- or postoperative transfusions. Estimated blood loss, levels fused, volume(s) transfused, and all related complications were also collected.
RESULTS: Only 48 of 150 patients who had cell saver available during surgery received an autologous infusion. Of the 48 patients who had an autologous infusion, 25 (52%) required additional allogeneic blood. Of the 102 patients who did not receive autologous blood, 33 (32%) received allogeneic blood perioperatively. Twelve of 30 patients (40%) who did not have cell saver available during surgery required allogeneic blood. Patients receiving an allogeneic blood transfusion received an average of two units, regardless of whether they had previously received autologous blood. The average cost for all blood products (both autologous and allogeneic) during surgeries with cell saver available was $1736, while the average cost for all blood products during surgeries without cell saver was $1012. No patient in our sample had a complication from allogeneic blood transfusion.
CONCLUSIONS: Infusing autologous cell saver blood during surgery does not appear to reduce the need for allogeneic blood transfusions among patients undergoing a single-level lumbar PSF. The majority of patients who had cell saver available during surgery did not receive an autologous infusion, leading to unnecessary additional cost. The total cost for blood is higher for surgeries that used cell saver as compared to surgeries without cell saver. The high cost of cell saver in combination with the low complication rate of allogeneic blood transfusions suggest that cell saver is unnecessary for patients undergoing a single-level lumbar PSF.
FDA DEVICE/DRUG STATUS: This abstract does not discuss or include any applicable devices or drugs.

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190. Gastrointestinal Preparation Reduces Length of Stay of Lumbar Fusion Patients

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BACKGROUND CONTEXT: The national bill of spine fusion has risen exponentially over the last decade surpassing $30 billion a year in 2008.
PURPOSE: In an effort to decrease length of stay in spine surgery we tested the impact of preoperative gastrointestinal preparation (as ordered routinely before heart surgery) on length of hospital stay and possible cost savings.
STUDY DESIGN/SETTING: Prospective study in a tertiary care center in Middle Georgia
PATIENT SAMPLE: Sixty-five patients undergoing lumbar spine fusion surgery were asked to participate in the study by taking 30 cc of milk of magnesia (MOM) the night before surgery. Risks and benefits were explained to the patients and informed consent was obtained. Thus, 53 lumbar spine fusion patients agreed to participate in the study and 12 (18.5%) refused to take MOM preoperatively. Among the 65 patients, 49.2% underwent 1 level fusion, 30.5% underwent 2 level fusion and 20.3% had >2 levels fusion.
OUTCOME MEASURES: Length of stay was collected in hours from time of admission note to time of discharge note. GI disturbances included nausea, vomiting, constipation and gastro-esophageal reflux. Cost savings from shortening of length of stay (if any) were extrapolated to a national level.
METHODS: Univariate test was used to study the impact of preoperative MOM administration and postoperative GI disturbances on length of stay. Test was applied using SPSS16.
RESULTS: The MOM group had 58.3% prevalence of postop GI disturbances versus 66% in the non MOM group. The MOM group had an average length of stay of 89.7 hours (standard deviation 63.2 hours) versus 140.8 hours (standard deviation 121.7 hours) in the non MOM group. Univariate analysis of a statistical model with the dependent variable being length of stay and independent variables being preoperative MOM administration, postoperative GI disturbances and number of fused levels showed that the presence of Postop GI disturbances had the highest impact (F=19.7, P=0.0) followed by preop MOM administration (F=7.8, P=0.008). Number of fused levels in this model did not reach statistical difference (F=1.9, P=0.097). According to the HCUP Nationwide Inpatient Sample, 247,047 hospital discharges were due to dorsal/dorsolumbar/lumbar/lumbosacral spinal fusion as the principle procedure in 2009. Conservatively, $247 million dollar can be saved every year if length of stay is reduced by one day, assuming the hospital charge of an overnight stay for this category of patients is $1,000. A ten-year saving sum will amount to $2.4 billion. If length of stay could be reduced by two days, the amount of savings would be double that number.
CONCLUSIONS: A simple preoperative measure such as gastrointestinal preparation before lumbar fusion surgery is associated with significant savings for the national health care system.
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3:40 – 4:40 PM
Concurrent Session: Surgical Complications

151. Surgical Treatment of Isthmic Versus Degenerative Spondylolisthesis: Complications and Outcomes

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BACKGROUND CONTEXT: Decompression and instrumented fusion is a well-established treatment for symptomatic low-grade spondylolisthesis, whether isthmic (IS) or degenerative (DS). Additionally, reduction of the slip has theoretical advantages of indirect foraminal decompression, improved sagittal balance, and more room for an interbody cage. Disc distraction alone often improves the slip for DS, but not IS. When reduction is advantageous (collapsed disc and foramina, grade 2 listhesis), accomplishing both slip reduction and transforaminal lumbar interbody fusion (TLIF) can be technically demanding. The surgical treatment of IS vs. DS has never been studied.
PURPOSE: This is the largest series of complications and outcomes for surgical treatment of low-grade spondylolisthesis, comparing IS to DS after single and multilevel arthrodesis.
STUDY DESIGN/SETTING: A review of prospectively collected clinical and radiographic data.
PATIENT SAMPLE: Two hundred forty-nine consecutive adults with grade 1 - 2 spondylolisthesis (DS-199, IS-50). Age: DS 65.4 years (34-85 years); IS 50.5 years (14 – 82 years).