

North Carolina Orthopaedic Association
2015 Annual Meeting
Abstracts: Reconstruction



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This continuing medical education activity is jointly provided by the NCOA
and the Southern Regional Area Health Education Center

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: **Shawn Hocker, MD**
OrthoWilmington, Wilmington, NC

Topic: **Early Experience with a Symmetric Femur TKA System**
Sunday, October 11

Historically Total Knee Arthroplasty systems had right and right and left femoral components that require two sets of trials and two sets of implants. A novel system (TJO) has a symmetric femur (and tibia) with greatly reduced operative instrument/treys, reduced inventory storage, and ease of setup and instrumentation from the surgical team. Early clinical experience shows at least equivalence with traditional TKA systems with regard to safety, recovery, and function.

Educational Objective: Clinical utility of a new total knee system that has many potential benefits including improved outcomes, reduced cost, and ease of use from the surgical team.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: **Matthew L. Brown, MD (Resident)**
Wake Forest Baptist Medical Center, Winston-Salem, NC

Topic: **Decreased Range of Motion following Total Knee Arthroplasty is Predicted by the Tampa Scale of Kinesiophobia (TSK)**
Sunday, October 11

Introduction

Total knee arthroplasty (TKA) is a highly successful and frequently performed procedure to alleviate pain and restore function in patients with knee osteoarthritis (Heck et al. 1998). A subset of patients are unsatisfied following TKA due to persistent pain, poor function, or other reasons (Franklin, Li, and Ayers 2008). Range of motion (ROM) is important for pain relief and function after TKA; however, some patients are hesitant to reach their full ROM potential during postoperative physical therapy. The Tampa Scale of Kinesiophobia (TSK) has been used to study the relationship between patients' fear of movement and outcomes of orthopaedic surgery. The primary purpose of the present investigation was to determine whether TSK scores correlated with decreased range of motion after primary TKA. A secondary endpoint was to determine whether showing patients a clinical intraoperative photograph of their TKA in maximal passive flexion would increase ROM following TKA.

Materials and Methods

Patients undergoing primary TKA were randomized into two groups. The first group was shown an intraoperative photograph with their knee in full flexion after the components had been inserted; the second group served as controls. Demographic information and pertinent medical histories were abstracted from each patient's medical record. Patients completed the TSK, short-form McGill Pain Score (MPS), and the short-form Geriatric Depression Scale (GDS) to obtain a psychological assessment. Active and passive knee ROM were measured using a standard long arm goniometer with the patient supine. Baseline demographic and patient characteristics for both groups were assessed using ANOVA for continuous variables and chi squared tests for categorical variables. A linear mixed model with random intercepts and slopes for time were implemented to determine whether TSK and viewing the photo correlated to ROM. This model accounts for the correlation over time between each subject's measurements. Models were adjusted for viewing of the photograph, time since surgery, age, Carlson Comorbidity Index (CCI), sex, and TSK. All analyses were performed in SAS Version 9.4 (Cary, NC) and a significance level of 0.05 was used throughout the analysis.

Results

79 patients were analyzed with respect to the main endpoint. The cohort included 39 males (40%), 45 right TKAs (57%), and 65 Caucasian patients (82%). 30 patients were prescribed psychiatric medications at baseline (38%). Age was 64.3 +/- 9.1 years (mean +/- SD). Body mass index (BMI) was 32.1 +/- 6.6 kg/m² (mean +/- SD). Opioid usage was 169.0 +/- 127.7 morphine equivalent units (mean +/- SD). A subset of 60 patients were included in the photographic portion of the study. 29 patients were in the control cohort while 31 were in the photographic cohort. There were no significant differences in patient demographics or medical comorbidities between the control and photographic cohorts. The linear mixed model demonstrated a significant negative association between TSK and both active flexion ($\beta = -0.47, p < 0.01$) and passive flexion ($\beta = -0.66, p < 0.001$). There was no significant difference in active or passive knee flexion among patients shown a clinical photograph of their knee in maximal flexion (99.0 +/- 17.4 degrees and 94.1 +/- 18.5 degrees, respectively) compared to control patients (106.1 +/- 14.4 degrees (p=0.10) and 100.9 +/- 15.5 degrees (p=0.14), respectively).

Discussion

Despite improvements in surgical and anesthetic techniques, refined prosthesis designs, and new rehabilitation protocols, there has been no concomitant decrease in the number of patients who remain dissatisfied following TKA. Investigators have begun to describe the relationship between patient psychological factors and outcomes following orthopaedic surgery. The TSK was developed as a tool to identify patients at risk for maladaptive responses to painful stimuli. Higher TSK scores have been shown to correspond to decreased function and worse pain following TKA. Our data extend these findings and suggest that the TSK may specifically help clinicians identify patients at risk for decreased ROM following TKA. Previous studies have identified decreased ROM as an important source of patient dissatisfaction following TKA. Patients with higher TSK scores might benefit from increased intervention during the perioperative and postoperative periods to optimize ROM following TKA. Our attempt to influence ROM by showing patients a clinical photograph did not produce a positive effect on ROM. The optimal intervention to cost-effectively maximize ROM following TKA remains unclear.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Michael Le, MD (Resident)
Carolinas Medical Center, Charlotte, NC

Topic: A Prospective Observational Study of TKA Compared to PKA with Respect to Outcome of Pain and Function Scores as Compared to Preoperative Pain and Function: Predictors of Outcome
Sunday, October 11

Background

Total Knee Arthroplasty (TKA) and Partial Knee Arthroplasty (PKA) have similar survivorship results of approximately 90% at 15-20 years. It has been reported that upwards of 10 to 15% of patients with TKA are dissatisfied with the outcome of their procedure. Registry data has shown a PKA failure rate 2-3 times that of TKA, particularly in the first 5 years after the index operation. Furthermore, the New Zealand Registry (NZR) data has reported patients with PKA are 4-6 times more likely to undergo revision to TKA at any level of Oxford Knee Scores. The reasons for revision from a PKA to TKA is not completely understood and approximately a third of PKA to TKA revisions are performed within the first year following the initial PKA. The purpose of this study is to examine the impact of TKA and PKA on pain, physical function, and health-related quality of life on patients with osteoarthritis of the knee; to explore the mediating effect of mental health status and comorbidities on pain, physical function and health-related quality of life following TKA or PKA; and to compare pain, physical function and health-related quality of life outcomes between patients receiving TKA and patients receiving PKA.

Methods

We instituted a multi-center prospective observational study of 182 patients who fit the indication for either TKA or PKA from dates April, 2011 to May, 2012. Patient outcome data was collected preoperatively and at defined postoperative at 1 year using Oxford Knee scores, WOMAC pain and physical function subscales, the EQ-5D, and the SF-36. Patient comorbidities, as well as preoperative narcotics or psychoactive drugs such as antidepressants and anti-anxiety medications were documented. One hundred and forty two patients had completed data at all collection points, (76 TKA) and (66 PKA), and are the basis for our reported results.

Results

As expected, TKA and PKA both had statistically significant improvement in all outcome scores measured. The difference between baseline scores and one year scores reached statistical significance between TKA (20.57) and PKA (18.32) on the Oxford Knee score, however, a 5 point difference is necessary to reach minimal clinical important difference (MCID). There was a trend toward greater improvement in WOMAC stiffness in TKA patients, however, their preoperative scores showed greater stiffness than PKA patients. The effect of comorbidities, chronic pain, and psychological state will be discussed.

Conclusion

In our series, patients receiving a TKA or PKA, for appropriate indications, have consistent and equivalent outcomes with improvement.

Educational Objective: To present prospective observational data of patients undergoing total knee arthroplasty compare to partial knee arthroplasty.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Mitchell R. Klement, MD (Resident)
Duke University Medical Center, Durham, NC

Topic: Does an Enhanced Recovery Pathway Decrease Length after Total Knee Arthroplasty?
Sunday, October 11

Background

Total knee arthroplasty (TKA), one of the larger and more painful orthopedic procedures, has doubled in the United States over the last decade and, with an aging population, the incidence is only expected to increase. In addition, growing health care financial burden places emphasis on institutions to provide high quality, cost effective care in an efficient manner for this large patient population. Many multimodal pain regimens have been described in attempts to reduce length of stay (LOS) but the ideal regimen is yet to be determined.

Methods

From January 1, 2013 to October 1, 2014 three perioperative pathways have been used to address surgical pain at our institution after TKA including femoral nerve catheter plus patient controlled analgesia (PCA, Group 1), Exparel® plus single shot femoral nerve block plus an oral analgesic protocol (Group 2), and adductor canal catheter and posterior capsule single shot block plus an oral analgesic protocol (Group 3). Little modification has occurred in respect to surgical technique, implant choice, or post-operative physiotherapy. The primary outcome measure was length of stay and secondary outcome was patient satisfaction.

Results

Overall, there were 134 patients in Group 1, 270 patients in Group 2, and 123 patients in Group 3. Patients in Group 3 who received adductor canal catheters have a lower LOS (2.29 days) and higher HCAHPS pain scores (79.8%).

Conclusions

Based on the results in this study, the use of an adductor canal catheter and posterior capsule single shot block plus a multimodal oral analgesic protocol resulted in a lower length of stay and improved pain management scores at a large tertiary academic center.

Educational Objective: To study the association between post-operative pain regimens and length of stay after total knee arthroplasty.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: F. Johannes Plate, MD, PhD (Resident)
Wake Forest Baptist Hospital, Winston-Salem, NC

Topic: Patient Factors and Cost Associated with 90-Day Readmission following THA
Sunday, October 11

Introduction

With the introduction of bundled payments by the Center for Medicare and Medicaid Services for total hip arthroplasty, the costs for 90-day readmissions for medical and/or surgical reasons will fall onto the hospital where the surgery was performed. Bundled payment systems may only be sustained if the readmissions are minimized and their cost is recovered. The purpose of this study was to identify specific areas of care in which cost can be potentially reduced to ease the financial burden of readmissions on hospitals that care for joint arthroplasty patients. Leading readmission diagnosis and their associated severity of illness (SOI) scores were analyzed with the hypothesis that patients with greater comorbidities and higher SOI scores experienced increased readmission costs.

Materials and Methods

The hospital billing records and total joint registry at an academic medical center were used to identify patients that underwent THA between January 2005 and December 2012. Patient medical records were analyzed for co-morbidities and discharge dispositions with a focus on medical or surgical readmissions 90 days following THA. The costs per readmission and the associated work-up and/or secondary procedures were retrieved from the hospital billing system. Readmissions were grouped according to surgical reasons (infection, dislocation, hardware failure, DVT, wound complication) and medical reasons (chest pain, pneumonia, urinary tract infection) based on previous reports and stratified by SOI and insurance status. ANOVA or Student t-tests were used to compare costs between different causes of readmission, SOI scores and reimbursement based on insurance status with alpha 0.05.

Results

A total of 1781 primary THAs were performed in the study period and 139 total readmissions (8.93%) in 120 patients during the first 90 days following surgery were identified. Leading causes for readmission were THA infection (21%), dislocation (15%), wound complications (11%), hardware failure (5%), pneumonia (4%), chest pain (3%), and deep venous thrombosis (3%). Total hospital costs were \$2,083,113 for all readmission episodes. The mean total costs for all surgical reasons (62%) for readmission (\$17,105) were significantly greater ($p=0.002$) compared with all medical reasons (38%) for readmission (\$11,095). Based on the current fee-for-service reimbursement, the hospital had a mean net loss of \$1,321 for medical readmissions compared with \$2,932 for surgical readmissions. The average hospital costs differed significantly ($p=0.012$) between the leading causes for readmission (\$23,177 for hardware failure, \$22,394 for THA infection, \$18,636 for pneumonia, \$15,014 for dislocation, \$14,308 for deep venous thrombosis, \$11,792 for chest pain). Mean total hospital costs were similar between Medicare/Medicaid readmissions (\$14,967) and private payers (\$15,032, $p=0.975$). Based on fee-for-service reimbursement, the hospital had a mean net loss per readmission in Medicare/Medicaid patients (\$2,643) compared with a net gain of \$76.28 in private payers. When costs were stratified by SOI, increasing costs for physician evaluation, imaging, laboratory workup, medication and transfusions, and overall hospital cost correlated significantly with increasing SOI ($p<0.05$). There was no correlation between increasing SOI and cost for ED visit and operating room costs. Patients that were transferred from outside hospitals or inpatient rehabilitation units had significantly higher overall hospital costs ($p=0.006$) and OR costs ($p=0.001$) compared to patients admitted from the ED or from clinic.

Discussion

Bundled payment systems for THA in Medicare/Medicaid patients rely on small profit margins that decrease with unplanned 90-readmissions and thereby hamper profitability for the provider. Hospital net loss was highest in Medicare/Medicaid with surgical causes for readmission with significant correlation between increasing SOI and increasing costs. This may place an increased cost burden on hospitals that care for complex patients with Medicare/Medicaid who have an unplanned readmission within 90 days of surgery and highlights considerations for payer mix.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: John Adam Ruder, MD (Resident)
Carolinas Medical Center, Charlotte, NC

Topic: Antibiotic Prophylaxis in Patients with a Reported Penicillin Allergy
Sunday, October 11

Introduction

Perioperative antibiotic prophylaxis remains one of the most important strategies for preventing periprosthetic joint infection (PJI) with current guideline recommending a first or second generation cephalosporin. Penicillin (PCN) allergy is often reported by patients, which often results in avoidance of cephalosporins due to fear of cross-reactivity. Alternative medications, such as vancomycin, must therefore be used despite its reduced coverage. Thus, the purpose of this study is to determine if PCN allergic patients treated with vancomycin are at increased risk of developing PJI.

Methods

A retrospective review of 7602 primary total joint arthroplasties (TJAs) performed between 2005 and 2013 were identified using a prospective institutional database. Patient reported PCN or cephalosporin allergy was electronically queried from the anesthesia note. Patients with multiple prophylactic antibiotics, unavailable perioperative antibiotic information, or those who received medication other than cefazolin and vancomycin were excluded. PJI was determined using a cross-match with an institutional PJI database constructed from ICD-9 codes. Logistic regression analysis was then performed to evaluate the risk of PJI.

Results

The rate of PJI was 1.4% (32/2296) in patients with a reported PCN allergy that received vancomycin, and was 1.1% (59/5306) in non-PCN allergic patients that received cefazolin. In the multivariate analysis, there was no increased risk of PJI between the two antibiotics (adjusted odds ratio: 1.4, 95% CI 0.6-3.1). While there were no significant differences in the organism profile between PJIs in both groups, the rate of resistant organisms was higher in patients who received vancomycin (11.9%, 7/59) compared to those who received cefazolin (3.1%, 1/32).

Conclusions

While prophylactic vancomycin alone did not result in a significantly higher rate of PJI, patients who received vancomycin and developed a PJI were more likely to develop an infection with a resistant organism. Future studies are needed to clarify the antibiotic indications in PCN allergic patients, including non-anaphylactic patients.

Educational Objective: To clarify the antibiotic indications in penicillin allergic patients, including non-anaphylactic patients undergoing primary total joint arthroplasties.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Susan M. Odum, PhD
OrthoCarolina Research Institute, Inc., Charlotte, NC

Topic: Alarming National Obesity Trends in Revision Total Knee Arthroplasty
Sunday, October 11

Introduction:

Obesity has been shown to be a risk factor for failure in total knee arthroplasty (TKA). The utilization of primary TKA in obese patients has increased significantly over the past decade. As such, it is also reasonable to expect a dramatic increase in obesity rates among patients undergoing revision total TKA (rTKA). The purpose of this study was to analyze longitudinal trends in obesity rates among patients undergoing rTKA.

Methods

We analyzed 451,982 patients who underwent rTKA between 2002 and 2012 identified using Nationwide Inpatient Sample discharge data. The obesity comorbidity indicator was utilized to define the dependent variable of obesity based on a BMI cut-off of 30 and the key explanatory variable was procedure year (2002-2012). We analyzed several covariates, including patient demographics (age, gender, and race), payer type, hospital type and patient health status. In addition to bivariate analysis using Chi-Square tests, a multivariate logistic regression model was performed.

Results

Of the 451,982 rTKA patients, 17.37% of patients were classified as obese. The obesity rate among rTKA patients increased significantly from 9.74% in 2002 to 24.57% in 2012 ($p < 0.0001$). After adjusting for all other factors, patients treated in 2011 (OR: 4.1 [3.7-4.6], $p < 0.0001$) or 2012 (OR: 4.5 [4.0-5.0], $p < 0.0001$) were over four times as likely to be obese, compared to patients treated in 2002. The obesity rate was significantly higher among females (19.9%) than males (13.8%, $p < 0.0001$) and females have a 53% (OR 1.5 95% CI 1.5-1.6) higher adjusted obesity rate. The obesity rate among rTKA patients between the ages of ages 45 and 64 had significantly higher obesity rates compared to patients less than 44 years old or greater than 65 years old (53%, 3%, 44%). This same age group had an adjusted 3-fold (OR 3.2, 95% CI 3.1-3.3) higher rate compared to other age groups. Obese patients were more like to have failure and revision of the tibial component (21.18%) than isolated femoral component (20.33%) or full component revision (19.15%).

Conclusions

As primary total knee continues to be utilized in the high-risk obese patient, these data illustrate a concurrent rise in TKA failures requiring a revision procedure. The more than four-fold increase in the obesity rate among patients undergoing rTKA over the past decade is an alarming trend. Improved clinical care pathways are needed to manage the obese total knee patient.

Educational Objective: To identify the rates and trends of obesity in revision total knee arthroplasty.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Elizabeth Newman, MD (Resident)
Wake Forest Baptist Hospital, Winston-Salem, NC

Topic: Incidence of Heterotopic Ossification in Direct Anterior Approach vs. Posterior Approach to Total Hip Arthroplasty
Sunday, October 11

Heterotopic ossification (HO) is a common complication following total hip arthroplasty (THA) that can lead to hip pain and decreased range of motion. The surgical approach used in THA has been studied as a risk factor for the development of HO. To date, there has not been a study comparing the incidence of HO following direct anterior approach (DAA) versus posterior approach to THA performed by a single surgeon at one institution. In the study presented here, all primary THAs performed by the senior author (JEL) from February 2007 to November 2012 were retrospectively reviewed. This included 235 DAA THAs and 120 posterior THAs. HO was graded based on the Brooker classification system. A logistic regression was performed to determine factors significantly associated with development of HO. The statistical analysis showed that patients who underwent DAA were significantly less likely to develop clinically significant HO when compared to patients who underwent posterior approach to THA. The overall incidence of HO following DAA in the series was 24.3% (3% Grade 3 and 0% Grade 4). The overall incidence of HO following posterior approach was 27.5% (4.2% Grade 3 and 3.3% Grade 4). In this study, patients receiving Aspirin, Warfarin, or Clopidogrel for deep vein thrombosis prophylaxis were less likely to develop clinically significant HO. Other factors found to be associated with the development of clinically significant HO include perioperative blood transfusions and known heart disease; and males were less likely to develop HO. This data may be instructive when approaching THA candidates with conditions that predispose them to the development of HO.

Educational Objective: To discuss risk factors for the development of HO following THA, specifically surgical approach and to present new research regarding the incidence of HO following DAA versus posterior approach to THA performed by a single surgeon at one institution.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Thorsten Seyler, MD, PhD
Duke University Medical Center, Durham, NC

Topic: **The Fate of Isolated Acetabular Revision: A Comparison of Metal-on-Metal and Metal-on-Polyethylene Bearings**
Sunday, October 11

Purpose

Isolated revision of the acetabular component has become an established option for revision hip surgery. However, it can be technically challenging and has been associated with an increased rate of postoperative instability and dislocation. The purpose of this study was to compare postoperative complication rates of isolated acetabular revision for two bearing types: metal-on-metal (MoM) and metal-on-polyethylene (MoP).

Methods

A review of the entire Medicare sample was performed using ICD-9 codes and CPT codes. The search identified 474 patients who underwent isolated revision of the acetabular component for a failed MoM bearing and 672 patients who underwent isolated revision of the acetabular component for a failed MoP bearing. Incidence, odds ratios and their respective 95% confidence intervals for 30-day, 90-day and 2-year, overall complications were calculated.

Results

The incidence of postoperative anemia within 90 days was 35.42% in the MOP group and 37.76% in MOM group. However, the incidence of transfusion was higher in MOP group, 37.2% versus 31.43%, respectively ($p=0.03$). In patients with a minimum of 2 year follow-up, the incidence of periprosthetic infection, dislocation, periprosthetic fracture, revision THA, mechanical complications, and I&D in the MoP cohort was 17.11%, 60.12%, 14.41%, 3.87%, 18.01%, 18.15%, and 9.23% versus 15.61%, 44.94%, 2.53%, 17.3%, 21.31%, and 10.76% in the MoM cohort. Other complications within 90 days in the MoP cohort were cellulitis/seroma (11.46%), bleeding (5.06%), wound complications (3.13%), and DVT (4.46%) versus cellulitis/seroma (8.65%), bleeding (4.85%), wound complications (3.8%), and DVT (4.01%) in MoM cohort.

Conclusion

The high rates of dislocations, infections, mechanical complication, and revision surgeries in both cohorts should alert the surgeon to undertake additional measures to decrease complication rates. While revision of MoM bearing has been associated with soft tissue destruction and instability due to metal wear, the overall complication profile in this study when compared to MoP bearing seems slightly better.

Educational Objective: To educate surgeons on complication profile in patients who undergo isolated acetabular revision with MoP and MoM bearing.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Marc R. Angerame, MD (Resident)
Carolinas Healthcare System & OrthoCarolina, Charlotte, NC

Topic: Dual Mobility Liners for Revision THA Decrease Early Dislocation
Sunday, October 11

Introduction

Hip dislocation and recurrent instability continue to be a major cause of failure in revision arthroplasty, with dislocation rates as high as 28%. Dual mobility acetabular components were designed to reduce dislocation rates while maintaining low friction. There is no previously reported data on Modular Dual Mobility X3 (MDM) THA in the revision setting, specifically regarding early dislocation (i.e., within 3 months of revision surgery). The purpose of this study was to evaluate early dislocation rates and complications in patients who received Modular Dual Mobility X3 (MDM) (Stryker, Mahwah, New Jersey) components for revision hip surgery.

Methods

A retrospective chart review was performed at two high volume arthroplasty centers on 124 consecutive patients who underwent revision THA with an MDM X3 dual mobility liner between 2011 and 2013. "Revision" THA was defined as any intervention in which one or more acetabular components were exchanged following a prior open hip arthroplasty procedure. The primary outcome measure was revision surgery. Secondary variables included age, gender, BMI, number of revision surgeries, infection status, length of follow-up, surgical approach, and implant sizes. Descriptive statistics were performed using JMP 11 software.

Results

124 patients underwent 124 revision THA surgeries utilizing the MDM X3 components from April 2011 to May 2013. The average age of the cohort was 70 years \pm 15 years while 53% of the patients were male. The average BMI was 30.7 \pm 7.3. 45.9% of patients required graft augmentation at the time of surgery. All 124 patients presented for follow-up with an average length of follow-up of 311 days \pm 248 days. 12 of 124 patients (9.7%) had one or more complications. 2 patients (1.6%) had a dislocation. 7 patients (5.6%) developed a prosthetic joint infection while 3 (3.5%) sustained a periprosthetic fracture that required reoperation.

Discussion

Dislocation in the early post-operative period (less than 3 months) remains a challenge in revision hip arthroplasty. Several studies have investigated the utility of using dual-mobility cups in revision surgery to reduce the incidence of recurrent dislocation with mixed results. Based on this study's data, dual mobility liners show significant improvements in both total complication rate as well as recurrent dislocation within the 3-month post operative period. However, the advantage of this particular device, particularly when employing the "mix and matched strategy" must be carefully weighed against the potential drawbacks including risk of aseptic loosening, osteolysis, intraprosthetic dislocation and increased implant wear.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Bryce A. Van Doren, MA, MPA, MPH
OrthoCarolina Research Institute, Inc., Charlotte, NC

Topic: Does MRSA Decolonization Reduce the Risk of Surgical Site Infections in Total Joint Arthroplasty Patients? A Meta-Analysis
Sunday, October 11

Introduction

Surgical site infection (SSI) after total joint arthroplasty (TJA) is associated with increased morbidity and mortality, as well as additional procedural and financial burden. Staphylococcus aureus, including methicillin-resistant Staphylococcus aureus, is the most commonly isolated organism in SSIs in TJA patients. A number of studies have examined the effect of pre-operative Staphylococcus aureus decolonization on SSIs, with varying results. Many of these studies had small sample sizes and, thus, were statistically underpowered. We performed a systematic review and a meta-analysis of the literature in order to assess the pooled effectiveness of Staphylococcus aureus decolonization on SSI after TJA.

Methods

The present meta-analysis examined the impact of pre-operative prophylactic decolonization protocols on the rates of SSI in TJA patients. Studies published between April 1999 and April 2015 in which the authors reported the rates of SSI between decolonized patients and historical or concurrent controls were eligible for inclusion. Searches for relevant studies were conducted using PubMed, PubMed Central, Cumulative Index to Nursing and Allied Health Literature, and World Cat. Additionally, unpublished conference papers were identified on the research social networking site, ResearchGate. Manual searches of reference lists were used to identify additional articles.

Results

Seventeen studies were eligible for inclusion, representing a total of 39,145 TJA patients. Random modeling of overall effects showed that, compared to untreated patients, those treated with decolonization protocols had significantly 39.9 % lower risk of SSI (Pooled RR: 0.601 [0.444-0.814]). Sub-group analysis demonstrated that chlorhexidine treatment (RR: 0.761 [0.565-1.026]) was less effective than mupirocin and/or vancomycin (RR: 0.411 [0.243-0.696], $p=0.046$). No significant differences were found for empiric decolonization versus active surveillance protocols ($p=0.603$), or for standard culture versus polymerase chain reaction (PCR) testing ($p=0.620$).

Conclusions

The results of this meta-analysis suggest that nasal decolonization of Staphylococcus aureus significantly reduces the risk of SSI in TJA patients. The most effective protocols may consist of mupirocin nasal ointment and perioperative vancomycin, although the risk is not entirely eliminated.

NORTH CAROLINA ORTHOPAEDIC ASSOCIATION 2015 ANNUAL MEETING

Lecture Abstract

Speaker: Scott M. Eskildsen, MD (Resident)
University of North Carolina, Chapel Hill, NC

Topic: The Effect of a Door Alarm on Decreasing Operating Room Traffic in Total Joint Arthroplasty
Sunday, October 11

Operating room traffic has been implicated in a number of studies to contribute to the risk of surgical site infections and prosthetic joint infections. In order to evaluate operating room foot traffic, door openings have been identified as a readily measured incident that contributes to an increase in operating room traffic and ultimately infection. The purpose of this study was to evaluate the effect of a door alarm on door openings during total joint arthroplasty. This prospective study evaluated 100 consecutive primary total hip and knee arthroplasty surgeries performed by a single surgeon over the course of 39 days. A door counter was placed on the substerile operating room door in a single operating room and the number of door openings, operative times, and total time the door was ajar during each surgical case were recorded. After 50 cases an audible alarm was placed on the substerile operating room door that sounded when the door was opened. Data was then recorded for an additional 50 cases. There was a significant difference in the overall mean door openings/minute ($p < 0.01$) between the period with no alarm ($0.53 \text{ x/min} \pm 0.09$) and alarm ($0.42 \text{ x/min} \pm 0.09$). However this effect slowly decreased over the time of the study, with door openings per minute increasing at a rate of 1.01 every day after initiation of the alarm while still remaining less than the rate without an alarm. The time the door was left ajar also decreased significantly from the period without an alarm to alarm. This study demonstrates that the use of an alarm can decrease door openings and ultimately the risk for surgical site infection. However, the effect is subject to tolerance and may not result in the elimination of unnecessary operating room traffic long-term. Continuing education and awareness may be necessary to maintain these results.

Educational Objective: Describe the impact of foot traffic on infection risk and a method to prevent unnecessary traffic.