options to provide better femoral fit options compared to its own standard size counterpart, it may only be addressing its own system’s sizing limitations. The next generation knee system has less overhang and underhang with its standard size, more likely due to surgical technique improvements, rather than component sizing modifications. Furthermore, the need for a narrower component option appears to be less since the newer design was used only one-fifth of the frequency that the gender component was used relative to its standard option.

Category: Knee - Arthroplasty

Time Since Primary Total Knee Arthroplasty Predicts the Success of Debridement, Antibiotics and Implant Retention for Prosthetic Joint Infection: Results from a Prospective, Multicenter Study of 189 Cases

Abstract ID# 22476
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Summary: The time since primary TKA can predict DAIR success in treating prosthetic joint infection.

Data:
Introduction: There remains a lack of consensus on the optimal indications for performing debridement, antibiotics and implant retention (DAIR) for prosthetic joint infection (PJI) following total knee arthroplasty (TKA).

Numerous PJ classification systems have been proposed, but it is unclear if they can be used to predict DAIR success. This study aimed to identify the success rate of DAIR in a large multicenter cohort and compare the success rates of DAIR between different classification systems of PJI.

Methods: Data was analyzed from the Prosthetic Joint Infection in Australia and New Zealand Observational (PIANO) study, a multicenter, prospective study of PJIs occurring between July 2014 and December 2017 in 27 hospitals across Australia and New Zealand. First time PJIs occurring after primary TKA that were managed with DAIR were included for analysis. Baseline patient and surgical data were collected on patient enrolment, and follow-up completed at 1- and 2-years. Treatment success was defined as the patient being alive with documented absence of clinical or microbiological evidence of infection and no ongoing use of antibiotics for the index joint at 2-year follow-up. The rate of DAIR success was compared against different types of PJI as defined by four different classification systems including the Coventry system (early PJI <1 month since primary TKA versus 1-24 months, and >24 months), the ICM system (early PJI <90 days since primary TKA, late PJI >90 days), the Auckland system (early PJI = <1 year since primary TKA, late PJI = >1 year) and the Tsukayama system (early PJI = <1 month since primary TKA, hematogenous PJI = >1 month with less than 7 days of symptoms, chronic PJI = >1 month with more than 7 days of symptoms). Univariate analysis was performed via Chi-square test. Multivariate logistic regression was used to compute odds ratios (OR) with 95% confidence intervals (CI). Individual multivariate models were produced for each classification system with adjustment for patient age, gender, body mass index, patient comorbidities, number of infecting organisms and the presence of Staphylococcus aureus or gram-negative bacteria. Results: A total of 189 PJI cases were managed with DAIR, with an overall success rate of 45% (85 out of 189). Early PJIs had a higher rate of DAIR success when analyzed according to the Coventry system (adjusted OR = 3.85, 95% CI 1.41 – 10.50, p = 0.008) or the ICM system (adjusted OR = 3.08, 95% CI 1.41 – 6.72, p = 0.005) and the Auckland system (adjusted OR = 2.60, 95% CI 1.26 – 5.35, p = 0.01). A lower rate of DAIR success was observed in both hematogenous (adjusted OR = 0.36, 95% CI 0.14 – 0.93, p = 0.034) and chronic infections (adjusted OR = 0.14, 95% CI 0.04 – 0.51, p = 0.003). Discussion and Conclusion: The success rate of DAIR is highest when performed in infections occurring within one year of the primary TKA. Late infections had a high failure rate following DAIR irrespective of their classification as hematogenous or chronic. Time since primary is a useful predictor of DAIR success.

Category: Knee - Arthroplasty

Knee Range of Motion after Medial Unicompartmental Knee Arthroplasty is Associated with the Preoperative Radiographic Anteroposterior Alignment of the Entire Lower Extremity and the Sagittal Spinepinal Alignment

Abstract ID# 21267
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Summary: Patients with a greater posterior tilt of the pelvic alignment had restrictions in knee extension postoperatively, and those with a greater varus alignment of the lower extremity preoperatively had a lower knee flexion after UKA.

Data:
Introduction: Although the knee range of motion (ROM) is an important factor...
affecting postoperative clinical outcomes, evidence regarding the relationship between spinopelvic alignment and the knee ROM or clinical outcomes after knee arthroplasty is lacking. We aimed to evaluate whether the anteroposterior alignment of the lower extremity and sagittal spinopelvic alignment affect the postoperative knee ROM and clinical outcomes after medial uncompartamental knee arthroplasty (UKA). Patients and Methods: Thirty-two patients (a total of 37 knees: 6 men, 7 knees; 26 women, 30 knees) who underwent navigation-assisted UKA were included in this retrospective study. Preoperative radiographic examinations of the anteroposterior hip-ankle-knee (HKA) angle were conducted and lateral spinopelvic parameters, including sagittal vertical axis, lumbar lordosis, sacral slope, pelvic tilt (PT), and pelvic incidence, were calculated. Correspondingly, the relationship of the knee ROM at 1 year after UKA and the postoperative new Knee Society Score (KSS) with radiographic parameters was investigated. Results: At 1-year post-UKA, the postoperative knee flexion angle was found to be significantly associated with the preoperative knee flexion angle (β = 0.041, 95% confidence interval [CI]: 0.025–0.141) and the preoperative HKA angle (β = 0.012, 95% CI: –2.377–0.342) in the multiple linear regression analysis. A knee extension restriction angle ≤ 10° was significantly correlated with the PT (β = 0.007, 95% CI: 0.772–0.959) in the logistic regression analysis. When the cutoff value of the PT was 24.5° for a postoperative knee extension restriction angle ≤ 10°, the sensitivity was 70.4% and the specificity was 100% based on receiver-operating characteristic curves. The PT in patients with postoperative knee extension restriction ≤ 10° (32.0° ± 6.6°) were significantly greater than that in patients with postoperative knee extension restriction < 10° (19.3° ± 5.0°) (p < 0.001). There was no significant relationship between the KSS and the HKA angle or spinopelvic parameters. Conclusion: Patients with a greater posterior tilt of the pelvic alignment had restrictions in knee extension postoperatively. Moreover, those with a greater varus alignment of the lower extremity preoperatively had a lower knee flexion after UKA.

Category: Knee - Arthroplasty

**Prospective Analysis of Surgeon Placed Nerve Block and Continuous Indwelling Catheter in the Adductor Canal In TKA**

Abstract ID# 21380

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**Summary:**

The purpose of this study was to investigate the safety, efficacy, efficiency, and cost-effectiveness of a novel surgeon placed single injection and catheter placement for a continuous regional nerve block in Total Knee Arthroplasty.

**Data:**

Background: Total Knee Arthroplasty (TKA) can be a very painful surgery and traditionally has required parental opioid analgesics and an inpatient setting for extended inpatient care. Regional block anesthesia has played a most prominent role in this regard. Methods: Fifty-six (56) patients were entered prospectively into a study cohort. Each patient underwent TKA by a single surgeon utilizing a novel surgeon placed single shot Adductor canal nerve block placement and placement of an indwelling catheter into the adductor canal through direct visualization of the muscles that make up the borders of the adductor canal. Patient reported outcomes were entered into an outcomes data base and then compared to an aggregate of over 3500 comparative TKA patients within the data base who did receive an ultrasound guided adductor canal block but did not receive the novel surgeon placed block and catheter placement. A Visual Analog Scale (VAS) was used to evaluate perioperative pain. Patient perioperative opioid usage, patient’s expectations of pain control, the incidence of common side effects, and average hospital length of stay (LOS) were also analyzed. Results: When compared to the aggregate of patients in the data base, the patients who received the novel surgeon block and catheter placement had a 24% reduction in total opioid pills used, (POD 1-7), 25% reduction in pain on VAS (3.9 to 2.9), 50% reduction in dizziness, 19% reduction in drooling, 88% reduction in vomiting, and a 62% reduction in nausea. Thirty-eight percent (38%) of these patients reported “Much less pain than expected” compared to thirteen percent (13%) of patients in the control aggregate. LOS for these patients was also reduced from an average of 2-3 days to 23 hours with one overnight in the hospital. There were no adverse effects associated with the novel surgeon placed block and catheter placement. Patient satisfaction was exceptionally high with Health Consumer Assessment of Health Profession and Services (HCAPHS) scores reported during this collection period at 97.2% (with a 2.8% adjustment mode). Conclusion: Using the placement technique described in this study, surgeons can reproducibly place a single injection and an indwelling catheter in the adductor canal through direct visualization of the muscles that make up the borders of the adductor canal. This indwelling catheter can provide a continuous nerve block for extended (4-5 days) pain relief. This technique for placement has potential advantages over other placement techniques with regards to safety, efficacy, and efficiency. When using the described technique in combination with a multi-modal pain management protocol, patients may experience significantly less pain, use less opioids, have a shorter hospital LOS, and have less side effects without jeopardizing physician quality scores and patient satisfaction. There is also the potential for significant cost reduction in a bundle payment scenario with additional anesthesia procedures eliminated. Study Design: Prospective comparative study: Level of evidence: 2

Category: Knee - Arthroplasty

**Impact of Soft Tissue Balance on 2-year Outcomes in TKA**

Abstract ID# 21591

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**Summary:**

Joint balance and laxity targets were identified for improved pain scores at 2-year post; No association was found between alignment and outcome, indicating joint balance may have a greater impact on outcome than alignment.

**Data:**

Introduction Sensor augmented robotic assisted surgical platforms can quantitatively achieve a balanced joint in total knee arthroplasty (TKA). Attempts to define optimal joint balance have met with some success, however, the confounding impact of component alignment and relevance of these targets on 2-year outcomes has not been investigated. In this study we investigate if intra-operative joint balance is associated with midterm outcomes and aim to define optimal balance targets for KOOS pain scores 2 years post-TKA. Additionally, we investigate how final alignment impacts outcome. Methods 212 patients were enrolled in a prospective cohort and received robot assisted posterior-cruciate-ligament sacrificing TKA with an ultra-congruent tibial insert utilizing a tibia-first gap-balancing approach. Demographics were captured pre-operatively and KOOS pain questionnaires were captured at 2-years post-op (747±101 days). Joint laxity throughout flexion was measured using a load of 70–90N during trialing. All tibial and femoral resection angles were recorded. Quadratic correlations between intra-operative joint gaps, alignment, and 2-year KOOS pain scores were investigated and informed threshold values for improved outcomes. Laxity is defined as the gaps between TKA components under load, and balance is the medial gap minus the lateral gap. Mann Whitney-U tests were used to compare groups. The proportion of knees which satisfy the Patient Acceptable Symptom State (PASS) (87.5 points) is used to determine the clinical utility of the targets for achieving improved patient outcomes. Results Demographics of the population are: 58%F, 67±8 years, BMI of 32±5 kg/m2, coronal deformity of 5.2±6.2 varus. Joint balance and laxity were correlated significantly with KOOS Pain score at 2-years throughout flexion. Balance and laxity targets with maximum and minimum thresholds for improved pain scores were identified in extension (med. laxity: -1 to 2.5 mm, balance: 2.5 mm med. tight to 1.0 mm lat. tight), midflexion (avg. laxity: 0 to 2.5 mm, balance: 1.5 mm med. tight to 1.0 mm lat. tight) and flexion (avg. laxity: 0 to 2.5 mm, balance: 2.0 mm med. tight to 1.5 mm lat. tight) and are shown in Table 1. When all targets are satisfied, a higher pain score was achieved compared to those which did not (93.8 vs 88.0, p = 0.0001). The proportion of knees which satisfied the PASS criterion was highest in knees which satisfied all targets (83%) and reported a 26% improvement compared to knees which did not satisfy all targets (p = 0.008). No associations were identified between femoral or tibio-femoral component alignment and outcome at 2 years post-op. Conclusions Joint balance and laxity targets were identified for improved pain scores at 2-year post. No association was found between alignment and outcome, indicating joint balance may have a greater impact on outcome than alignment.