patients who had undergone a functionally aligned RA-TKA. Post-operatively they were compared for differences in FJS, OKS, pain score, ROM, ability to ascend and descend stairs as well as kneel. Results 101 matched pairs were eligible for final review. Both groups had significant improvements in FJS and Oxford Knee Score (OKS) following surgery. Pain and FJS had become equivalent at one year with all remaining measures being significantly better in the UKA cohort. At 2 years there was no significant difference between the UKA and TKA patients in any outcome measure observed. Conclusion Functionally Aligned RA-TKA and RA-UKA have both been shown to be successful treatments for knee arthritis in this study. The UKA group have superior results in the first year post-surgery, but there was no difference in outcomes between the two groups at 2 years. These outcomes should be considered when deciding appropriate treatment choice for individual patients in which either treatment could be utilised.

Category: Knee - Arthroplasty

Two-Year Burden of Antibiotic Use for Prosthetic Joint Infection Following Total Knee Arthroplasty

Abstract ID# 22563
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Summary:
PJI patients spend 135.8 more days and $2138.9 more dollars on antibiotic use when compared to non-PJI patients.

Data:
Introduction: Prosthetic joint infection (PJI) is the most common indication for TKA revision and is associated with higher morbidity and mortality. In addition, it poses a substantial economic burden on patients and the healthcare system as it almost always needs at least one surgical intervention. Our study aims to estimate it poses a substantial economic burden on patients and the healthcare system as it almost always needs at least one surgical intervention. Our study aims to estimate.

Methods: We conducted an observational cohort study with a 2-year follow-up using the IBM Watson MarketScan Commercial Claims and Encounters Database. Patients with osteoarthritis who underwent primary TKA between January 1st and September 30th, 2017, were included. Primary exposure was the diagnosis of PJI within 90 days post-TKA. The primary outcome was the days of antibiotic use, and the secondary outcome was the costs associated with antibiotics, both over the 2-year period post-TKA. Propensity score matching analysis was performed matching with patient and provider characteristics. Results: A total of 13,201 patients (female 59.0%, age 59.4 ± 8.4, PJI 1.0%) were included in the study. After propensity score matching, patients with PJI had 135.8 more days of antibiotic use than patients without PJI (165.1 days vs 29.3 days, P < 0.001). PJI patients also spent $2138.9 more on antibiotics than those without PJI ($2242.0 vs $1033.1, P < 0.001). The attributable cost of antibiotics use for PJI patients is estimated to be over $12 million in two years in the United States and reflects $8,000 antibiotic-days of therapy. Conclusion: By extrapolating the result of this study, the cost of antibiotic use attributable for PJI is estimated to be over $12 million over the first 2 years post-TKA in the United States, and accounts for over $14,000 antibiotic days. By reducing knee prosthesis infections, we could expect to see significant secondary antibiotic stewardship gains in this common surgical population.

Category: Knee - Arthroplasty

Valgus Coronal Deformity Does Not Adversely Affect Outcomes of Total Knee Arthroplasty

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Summary:
Valgus deformity was not associated with inferior patient reported outcomes or lower rates of satisfaction, compared to varus knees at 1 year after arthroplasty. Data: Preoperative coronal deformities are commonly seen in subjects prior to total knee arthroplasty (TKA). A valgus alignment may represent a greater technical challenge for the surgeon. It has recently been reported that a valgus deformity is associated with a two-fold risk of failure at a median of 3.3 years with an incidence of 3.3%, compared to 1.4% in varus aligned TKA. The effect of coronal alignment on patient reported outcomes (PROMs) after arthroplasty has received relatively little attention and its effect on satisfaction with TKA has not been reported. Methods Between 2019 and 2021 597 consecutive patients underwent primary TKA for osteoarthritis and consented to participation in a prospective database under the care of the 3 investigating surgeons, and completed baseline PROMS. The primary outcome was in varus 10 degrees or more. The attributable cost of antibiotics use for PJI patients is estimated to be over $12 million in two years in the United States, and accounts for over $14,000 antibiotic days. By reducing knee prosthesis infections, we could expect to see significant secondary antibiotic stewardship gains in this common surgical population.

Category: Knee - Arthroplasty

Pre-Operative Patient Factors Can Predict Progression to Bilateral Knee Arthroplasty Within 7 Years

Abstract ID# 22792
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Summary:
One in three total knee arthroplasty patients progressed to bilateral total knee arthroplasty within 7 years of the index surgery, and progression could be predicted by pre-operative variables. Data: One in three total knee arthroplasty patients progressed to bilateral total knee arthroplasty within 7 years of the index surgery, and progression could be predicted by pre-operative variables. It is estimated that as many as 40% of patients who receive a total knee arthroplasty in the management of osteoarthritis return for a subsequent total knee arthroplasty in the contralateral knee within 10 years. The risk factors for a first total knee arthroplasty are well understood, but much less is known about the risk factors for patients who progress to bilateral knee arthroplasty. Identifying the risk factors associated with this progression may provide an opportunity for more thorough planning and expectation setting. All patients of a single orthopaedic surgeon who had undergone a total knee arthroplasty in the management of osteoarthritis were evaluated for inclusion in this study. Patients who had undergone a knee arthroplasty prior to their first documented surgery with this surgeon were excluded, as were patients who had undergone...
simultaneous bilateral knee arthroplasty. Patients were assessed (i) immediately prior to surgery, (ii) 12 months following surgery, and (iii) 6-7 years following surgery. At the pre-operative and 12 months post-operative assessments, patients were assessed on the Oxford-12 Knee Score, the Knee Society Knee Score, the SF-12, the presence or absence of contralateral knee pain and body mass index. At 6-7 years post-operative assessment, patients were asked about any surgery or pain in each knee since their total knee arthroplasty. A Classification and Regression Tree was developed to identify factors associated with a higher likelihood of progression to bilateral total knee arthroplasty. Seven hundred and fourteen patients were included; 69% of these were assessed at 6-7 years. Of these patients 31.6% progressed to bilateral total knee arthroplasty within 7 years of the index surgery. The strongest prediction model of who progressed to bilateral knee arthroplasty included three classification levels – pain in the contralateral knee prior to the index surgery, body mass index, and Mental Component Score on SF12 measure prior to the index surgery. None of the measures from the 12 month assessment improved the prediction model. Patients who reported an absence of pain in the contralateral knee prior to the index surgery had a 20% chance of progressing to bilateral total knee arthroplasty within 7 years. Patients who reported the presence of pain in the contralateral knee prior to the index surgery, and had a body mass index greater than 30.7 had a 70% chance of progressing to bilateral knee arthroplasty. Patients with pain in the contralateral knee but with a body mass index of less than 30.7 were just as likely to progress to bilateral knee surgery as those with high body mass index if they had a Mental Component Score of greater than 55. In this cohort, one in three total knee arthroplasty patients progressed to bilateral total knee arthroplasty within 7 years of the index surgery. Progression to bilateral knee arthroplasty was predicted by 3 key outcomes – the presence of pain in the contralateral knee, body mass index and SF12. These outcomes were measured prior to the index surgery, and can therefore help to inform expectations of outcome, and planning for multiple surgeries.

Category: Knee - Arthroplasty

**Patello-Femoral Forces in the Native and Replaced Knee are Significantly Different. An Insight to Anterior Knee Pain?**

Abstract ID# 22791

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**Summary:** Currently there is no method of characterising the patellofemoral loading occurring dynamically in the native knee or during knee replacement. We describe a novel apparatus to dynamically measure patella loading in the native and replaced knee, offering the possibility of reducing AKP by more accurate balancing and replication of the patellofemoral forces.

**Data:**

Introduction. Twenty percent of patients report dissatisfaction following TKR. 45% of this group characterise anterior knee pain (AKP) as a source of their discomfort. Therefore, there is interest in studying the ‘Third Space’ or patellofemoral joint and the pressures and function of the surrounding extensor hood. Currently there is no method of characterising the patellofemoral loading occurring dynamically in the native knee or during knee replacement. We describe a novel apparatus to dynamically measure patella loading in the native and replaced knee, and the effect of varying the depth and angle of patella resection. Method. A sensory apparatus was attached to the patella undersurface recording pressures through a range of full flexion in the patellofemoral joint in four native cadaveric knees (unpreserved, pelvis to toe preparations). Sensors were positioned at superior, inferior, medial and lateral positions on the patella surface.Sixteen range of motion studies from full extension to full extension were completed. A TKR was then performed under optimal conditions with robot assistance (MAKO, Stryker inc.) to control accuracy and reproducibility between the four cadavers. In this way surgeon variability was reduced. The patellofemoral sensor was reintroduced and the measurements repeated. The effect of different depths and angles of patella resection were noted. Reliability and reproducibility was shown in an in vitro test rig and verified in the four cadaveric studies. Sensor data was compared for all 4 quadrants using ANOVA with alpha error 0.05. Results. A clear, reproducible pattern of patellofemoral loading occurs in the native cadaveric knee. Following TKR this was significantly changed in both pattern and magnitude (p<0.01). Changing the depth and angle of patella resection altered patellofemoral loading (p< 0.05). In some cases, by the surgeon selecting appropriate depths and angles of patellofemoral resection to address aspects of the abnormal patterns observed after TKR, it was possible to achieve the same patterns and magnitude of patellofemoral forces observed in the native knee therefore replicating natural patellofemoral loading. Conclusions. A characteristic pattern of patellofemoral loading is shown in the native knee which is significantly altered following TKR, suggesting abnormal loading of the patella and extensor hood apparatus may be responsible in AKP seen after TKR. It has been possible to characterise for instance, the lateral loading that occurs in lateral maltracking and subsequently address and reduce the overload by altering the depth and angle of subsequent patella resections. Altering patella resection depth and angles subsequently allows loading in TKR to approach that of the native knee, offering the possibility of reducing AKP by more accurate balancing and replication of the patellofemoral forces.

Category: Knee - Arthroplasty

**Is Patellar Resurfacing in Total Knee Arthroplasty Associated with a Higher Incidence of Patella Baja?**

Abstract ID# 2338

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**Summary:** Patients who undergo patellar resurfacing during total knee arthroplasty do not have a higher incidence of patella baja when compared to those who do not undergo patellar resurfacing.

**Data:**

**PURPOSE:** While total knee arthroplasty (TKA) is a highly successful procedure, it is not without potential complications. Patella baja is a complication that results in an abnormally low-lying patella with associated anterior knee pain, crepitus, and decreased range of motion. To date, no studies have explored the association between patellar resurfacing and the incidence of patella baja. The aim of this study was to compare rates of patella baja between unresurfaced patellas and resurfaced patellas in patients undergoing TKA.

**METHODS:** A retrospective review was conducted at a single institution of patients who underwent TKA between October 2009 and January 2020. Patients were included if they had at least one preoperative radiograph and one-year follow-up radiograph. Patients with a history of prior knee trauma or inflammatory arthropathy were excluded. Blackburne-Peel (BPR) and Insall-Salvati ratios (ISR) were measured on preoperative and one-year postoperative radiographs. An ISR of less than 0.8 in addition to a BPR of less than 0.5 was defined as patella baja whereas a BPR of less than 0.5 alone was defined as pseudopatella baja. Statistical analysis was performed using a linear model analysis of variance and Fishers exact test.

**RESULTS:** 318 TKAs underwent radiographic evaluation, 176 resurfaced and 142 unresurfaced patellas. Of the resurfaced patients 4% (7/176) were diagnosed with true patella baja, while of the unresurfaced patellas 5.6% (8/142) were found to have true patella baja. Of the resurfaced patellas 8% (14/176) were found to have pseudopatella baja compared to 7% (10/142) in the unresurfaced group. Patellar resurfacing was not associated with a higher incidence of patella baja (p=0.60) or pseudopatella baja (p=0.83). Lower preoperative ISRs (p=0.04) and BPRs (0.03) were highly predictive of a higher incidence of patella baja post TKA.

**CONCLUSION:** The added trauma of patellar resurfacing in TKA is not associated with a higher incidence of patella baja in TKA when compared to unresurfaced patellas. Lower preoperative ISRs and BPRs are highly predictive of a higher incidence of postoperative patella baja.

Category: Knee - Arthroplasty

**Intra-Operative Change of Fixed Flexion Deformity in Robotic-Arm Assisted Unicompartmental Knee Arthroplasty**

Abstract ID# 23580

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