Conclusion: High step count led to improved PROMs scores compared to low step-count across all time points. Early post-operative step-count was significantly impacted by age and sex. Generic recovery profiles may not be appropriate across a diverse population.

Category: Knee - Arthroplasty

Arthroscopic Procedures in the Year Preceding Total Knee Arthroplasty: Incidence, Costs and Outcomes

Abstract ID# 22557
All Authors:
Eric L. Smith MD UNITED STATES
Darren Z Nin PhD UNITED STATES
Ya-Wen Chen MD, MPH UNITED STATES
Ruija Niu MPH UNITED STATES
Carl T. Talmo MD UNITED STATES
Brian L. Hollenbeck MD UNITED STATES
David C. Chang PhD, MPH, MBA UNITED STATES
David A Mattingly MD UNITED STATES

Summary:
5.2% of patients underwent knee arthroscopy in the year prior to TKA despite literature support and clinical recommendations against its use.

Data:
Introduction: The cost-effectiveness of arthroscopic knee procedures has been found to be similar to several nonoperative treatments for knee osteoarthritis. However, the utilization rate of arthroscopic knee procedures preceding total knee arthroplasty (TKA) remains high, and may result in poor postoperative outcomes when performed in the year prior to TKA. The purpose of this study is to describe the prevalence and costs of knee arthroscopic procedures performed in the one-year period prior to a primary TKA procedure, and the impact of arthroscopic procedures on TKA outcomes. Methods: An observational cohort study was conducted using the IBM Watson Health MarketScan databases from January 1, 2017, to December 31, 2019. Knee arthroscopic procedures performed in the one-year period before a primary TKA were identified. The primary outcomes of interest were cost of these procedures, and the risk of 90-day postoperative complications. Results: 2,904 patients, representing 5.2% of the analyzed cohort underwent arthroscopic procedures in the year prior to TKA. The most common procedure and diagnosis were meniscectomy and meniscal tear respectively, with procedures performed an average of 7.2 ± 3.0 months before TKA. Average per patient costs were $9716 ± 5500 in the highest payment quartile, versus $1789 ± 636 in the lowest payment quartile. No differences were found in the risk of 90-day postoperative infection between patients with and without a history of knee arthroscopic procedures. Conclusion: 5.2% of patients underwent knee arthroscopy in the year prior to TKA despite literature support and clinical recommendations against its use. While no association was seen with PJII risk, the costs associated with these procedures are high and may increase the overall cost of management of knee osteoarthritis.

Category: Knee - Arthroplasty

Comparison of Patient Reported Outcome Measures Between Bicruciate-Stabilized and Posterior-Stabilized Total Knee Arthroplasty in the Same Patients: A Randomized Controlled Trial

Abstract ID# 22888
All Authors:
Sungcheol Yang MD KOREA, REPUBLIC OF
Min-Soo Kim MD, PhD KOREA, REPUBLIC OF
Dongho Kwak MD KOREA, REPUBLIC OF
Hyukjin Jang MD KOREA, REPUBLIC OF
Ryu Kyoungh Cho MD KOREA, REPUBLIC OF
Yong In MD, PhD KOREA, REPUBLIC OF

Summary:
A prospective, randomized controlled trial revealed that there was no significant differences in radiological outcomes and PROMs including preference and WOMAC scores between groups with UC and PS inserts at 1 year postoperatively.

Data:
Introduction: The purpose of this study was to compare not only the radiological results, but also postoperative patient-reported outcomes measures (PROMs) of Bicruciate stabilized (BCS) and posterior stabilized (PS) total knee arthroplasty (TKA) in the same patients. Methods: A prospective, randomized controlled trial was performed in 48 patients who received bilateral TKAs. One knee was randomly assigned to receive a BCS TKA, and the other knee was scheduled for a PS TKA from the same company knee system. The anteroposterior (AP) stability was evaluated using 20° flexion radiographs with anterior and 90° flexion radiographs with posterior drawer stress at 1 year postoperatively. Postoperative PROMs were compared using Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score and preference of operation side. Forgonnt joint score (FJS) was also evaluated in both group. Results: There was no significant difference with regard to the demographics and preoperative measures. No significant difference in static AP laxity was seen (8.2mm in the BCS group vs 8.7mm in the PS group, p > 0.05). There were no significant differences in the WOMAC subscores between the two groups at preoperatively and 1 year postoperatively (all p > 0.05). There was no difference of preference (p > 0.05) and FJS (S3.5 in the BCS group vs 50.4 in the PS group, p > 0.05) between BCS and PS group. Conclusion: Despite theoretical advantages of BCS prosthesis, there was no significant differences in radiological outcomes and PROMs including preference and WOMAC scores between groups with UC and PS inserts at 1 year postoperatively.

Category: Knee - Arthroplasty

Comparison of Revision ‘Thresholds’ Using Patient Reported Outcomes Following Total and Unicompartmental Knee Arthroplasty

Abstract ID# 23023
All Authors:
Mei Lin Tay MSc NEW ZEALAND
Simon W. Young MD, FRACS NEW ZEALAND
Paul Monk DPhil (Oxon), FRCS NEW ZEALAND
Gary J. Hooper MD, FRACS NEW ZEALAND

Summary:
A lower revision threshold was found with UKA when compared with a matched TKA cohort.

Data:
COMPARISON OF REVISION ‘THRESHOLDS’ USING PATIENT REPORTED OUTCOMES FOLLOWING TOTAL AND UNICOMPARTMENTAL KNEE ARTHROPLASTY M.L. Tay, A.P. Monk, C.M. Frampton, G.J. Hooper, S.W. Young University of Auckland, Auckland, New Zealand North Shore Hospital, Auckland, New Zealand Auckland City Hospital, Auckland, New Zealand University of Otago, Christchurch, New Zealand Email: m.tay@aucland.ac.nz Source of the study: University of Auckland, Auckland, New Zealand and University of Otago, Christchurch, New Zealand Aims Patient reported outcome measures (PROMs) are predictors of knee arthroplasty revision. Unicompartmental knee arthroplasty (UKA) is effective for patients with the correct indications, however has higher revision rates than total knee arthroplasty (TKA). Different revision thresholds for the procedures have been postulated. Our aims were to investigate: 1) if PROMs could predict knee arthroplasty revision within two years of the surgery, 2) if revision ‘thresholds’ differed between TKA and UKA. Patients and Methods All TKAs and UKAs captured by the New Zealand Joint Registry between 1999 and 2019 with at least one OKS response at six months (TKA n=27,708, UKA n=8,415), five years (TKA n=11,519, UKA n=3,365) or ten years (TKA n=6,311, UKA n=1,744) were included. were propensity-score matched 2:1 with UKAs for comparison of revision thresholds. Results Logistic regression indicated that for every one-unit decrease in OKS, the odds of TKA and UKA revision decreased by 10% and 11% at six months, 10% and 12% at five years and 9% and 5% at ten years. Fewer TKA patients with ‘poor’ outcomes (≥25) subsequently underwent revision compared with UKA at six months (5.1% vs. 19.6%, p<0.001), five years (4.3% vs. 12.5%, p<0.001) and ten years (6.4% vs. 15.0%, p=0.02). Compared with TKA, UKA patients were 2.5 times more likely to undergo revision for ‘unknown’ reasons, bearing dislocations and disease progression. Conclusions The OKS is a strong predictor of subsequent knee arthroplasty revision within two years of the score from easy to late term. A lower revision threshold was found with UKA when compared with a matched TKA cohort. Higher revision rates of UKA are associated with both lower clinical thresholds for revision and additional modes of UKA failure.

Category: Knee - Arthroplasty

Combining Load Sensors and a Robotic Arm to Balance TKA : Clinical Results at One Year

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Abstract ID# 21831
All Authors:
Julien Bardou-Jacquet MD FRANCE
Charles Champeaux PhD FRANCE

Summary: Balancing a TKA only by bone recuts is reliable and reproducible with a robotic arm under the control of a load sensor with NO soft tissue release, it improves clinical results at one year follow up.

Data: Achieving a well balanced total knee arthroplasty (TKA) throughout the entire range of motion leads to improved patient outcomes and satisfaction. Sensor-assisted technology allows the surgeon to quantitatively assess and address imbalance through either soft tissue releases or bone recuts. However soft tissue releases lead to unpredictable gap increments and over-releases. The primary objective of this study was to demonstrate the ability to achieve a quantitatively well balanced knee arthroplasty by combining a robotic arm (MAKO, Stryker, Kalamazoo, Michigan, USA) and an intra-operative load sensor (VeraSense, Stryker, Kalamazoo, Michigan, USA), while avoiding any soft tissue correction. During a consecutive and prospective serie of 56 robotic arm total knee arthroplasties, intra-operative load sensors, were used following the initial bone resections to quantitatively assess the knee’s state of balance through the range of motion with trial components in place. Load measurements were taken at 10 and 90 degrees of knee flexion. A balanced knee was defined as a force between the femur and the tibia between 22 and 200 Newton, with a difference between the lateral and medial side less than 66 Newton. Depending on these parameters, the thickness of the polyethylene insert and/or a bone recut(s) is made. The bone recuts are made with the interface of the robotic arm in the three planes of space, half-millimeter by half-millimeter with between each new recut a control by the load sensor. The initial load numbers were recorded as well as the numbers and type of subsequent corrections needed to achieve a quantitative well balanced TKA. Of the 56 robotics cases, only 23 (41%) were well-balanced after the initial bone cuts (restricted kinematic alignment adjusted after tensioning collateral ligaments during surgery). In 29 cases, one or two, and rarely three bone recut(s) were required to balance the knee. It should be explicitly noted that no soft tissue release were done for any of the 56 cases. The posterior cruciate ligament was always kept intact. At the end of the procedure 50 cases (89%) were well balanced in extension, 50 (89%) in flexion and 43 (76%) in flexion and in extension. Recuts improved Flexion/Extension unbalanced knee in 95% of cases. At one year follow up the functional IKSS score was 76,9 (+/-16) and the Forgotten Joint Score 69.3 (+/-28). According the FJS12-PASS and an ordinal logistic regression an unbalanced knee at 10° or 90° of flexion is associated with a bad clinical result.

Based on this study, a well soft-tissue balanced TKA matters (imbalance TKA leads to ankle mechanical axis. The hip to heel mechanical axis was more valgus 80% of the time with a mean 1.6 degrees more valgus (range 1degree - 6.1degrees), more varus in 9.5% (range 1degrees-4.1degrees) and 10.5% of patients had the same mechanical axis. There was a statistical difference between the hip to heel mechanical axis and the hip to ankle mechanical axis (p<0.001). Preop varus knees (>5 degrees) had a valgus TKA (>1degrees) in 18% of patients with a hip to ankle mechanical alignment. In comparison 39.2% had a valgus TKA with a hip to heel mechanical alignment.

Conclusion: Navigation and Robotic technologies use the hip to ankle mechanical axis measurement to determine the alignment of a TKA. This study demonstrates that 80% of the time this will result in more valgus alignment of the lower limb.

Category: Knee - Arthroplasty

Lower Limb Alignment Evaluation. Are We Getting This Wrong? We Walk On Our Heel Not Our Ankle

Abstract ID# 22264
All Authors:
Paul Nardelli Dr.med.univ. AUSTRIA
Dietmar Dammerer Prof. Dr.med.univ., MSc, PhD AUSTRIA
Michael C. Liebensteiner MD, PhD AUSTRIA
Sabrina Neururer Dipl.-Ing. AUSTRIA
Kerstin Gruber cand. med. AUSTRIA
David Wippel Dr.med.univ. AUSTRIA
Nadine Kogler cand. med. AUSTRIA
Sebastian Ender Dr.med.univ. AUSTRIA
Hermann Leitner AUSTRIA
Benedikt Koller Dr.med.univ. AUSTRIA
Martin Fischer Dr.med.univ. AUSTRIA

Summary: It is recommended that patella resurfacing be applied in patients with severe Iwano Stage 3 or 4 patellofemoral osteoarthritis during TKA. Does the Severity of Preoperative Patellofemoral Joint Degeneration Influence the Clinical Outcome of Total Knee Arthroplasty without Patella Resurfacing?

Abstract Objective: To determine whether the preoperative degree of degeneration of the patellofemoral joint really affects the outcome of total knee arthroplasty (TKA) surgery without a patella button and thus to establish a parameter that might serve as guiding factor to decide whether or not to perform retro-patellar resurfacing. Methods: Application of a retrospective-comparative design on the basis of arthroplasty registry data that included patients with primary TKA with patellar resurfacing. Patients were allocated to the following groups based on preoperative radiographic stage of patellofemoral joint degeneration: a) mild patellofemoral osteoarthritis (Iwano Stage 1-2) and b) severe patellofemoral osteoarthritis (Iwano Stage 3-4). For patient-reported outcome measurement the Western Ontario and MacMaster Universities Osteoarthritis Index (WOMAC) score was taken once preoperative and once 1-year postoperative (0: best, 100 worst). In addition, implant survival was calculated from the arthroplasty registry data. Results: In 1209 primary TKA without patella resurfacing, 3-year survival was 97.4% and 92.5% in patients with preoperative mild and severe patellofemoral osteoarthritis, respectively (p=0.002). Five-year survival was 95.8% vs. 91.4% (p=0.033) and 10-year survival was 93.3% vs. 88.6% (p=0.033). Postoperative WOMAC total and WOMAC subscores did not differ significantly between groups, but potentially suffered from type 2 error. Conclusions: From the study findings it is concluded that patients with preoperative severe patellofemoral osteoarthritis have significantly higher risks for reoperation than do those with preoperative mild patellofemoral osteoarthritis – when treated with TKA without patella resurfacing. Hence, it is recommended that patella resurfacing be applied in patients with severe Iwano Stage 3 or 4 patellofemoral osteoarthritis during TKA.

Category: Knee - Arthroplasty

Varus Thrust May Influence Patient Clinical Outcome Measures After Total Knee Arthroplasty

Abstract ID# 22604
All Authors:
Mark G. Clatworthy FRACS NEW ZEALAND
Nicola Blucher BA MA MBBS FRCS UNITED KINGDOM
J Donald Hansom FRCS, MD UNITED KINGDOM
Jérome Murgier MD FRANCE
Felix Humphries MBChB NEW ZEALAND

Summary: Navigation and Robotic technologies use the hip to ankle mechanical axis measurement to determine the alignment of a TKA. This study demonstrates that 80% of the time this will result in more valgus alignment of the lower limb.

Abstract Objective: To determine whether the preoperative degree of degeneration of the patellofemoral joint really affects the outcome of total knee arthroplasty (TKA) surgery without a patella button and thus to establish a parameter that might serve as guiding factor to decide whether or not to perform retro-patellar resurfacing. Methods: Application of a retrospective-comparative design on the basis of arthroplasty registry data that included patients with primary TKA with patellar resurfacing. Patients were allocated to the following groups based on preoperative radiographic stage of patellofemoral joint degeneration: a) mild patellofemoral osteoarthritis (Iwano Stage 1-2) and b) severe patellofemoral osteoarthritis (Iwano Stage 3-4). For patient-reported outcome measurement the Western Ontario and MacMaster Universities Osteoarthritis Index (WOMAC) score was taken once preoperative and once 1-year postoperative (0: best, 100 worst). In addition, implant survival was calculated from the arthroplasty registry data. Results: In 1209 primary TKA without patella resurfacing, 3-year survival was 97.4% and 92.5% in patients with preoperative mild and severe patellofemoral osteoarthritis, respectively (p=0.002). Five-year survival was 95.8% vs. 91.4% (p=0.033) and 10-year survival was 93.3% vs. 88.6% (p=0.033). Postoperative WOMAC total and WOMAC subscores did not differ significantly between groups, but potentially suffered from type 2 error. Conclusions: From the study findings it is concluded that patients with preoperative severe patellofemoral osteoarthritis have significantly higher risks for reoperation than do those with preoperative mild patellofemoral osteoarthritis – when treated with TKA without patella resurfacing. Hence, it is recommended that patella resurfacing be applied in patients with severe Iwano Stage 3 or 4 patellofemoral osteoarthritis during TKA.

Category: Knee - Arthroplasty

Varus Thrust May Influence Patient Clinical Outcome Measures After Total Knee Arthroplasty