

Free Paper Session II: Adult Joint Reconstruction I

FP2.1

Effects of Intravenous Lidocaine in Total Knee Joint Arthroplasty: An Interim Analysis

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Introduction: Lidocaine, a widely-used local anaesthetic, is proved effective in reducing postoperative pain when administered intravenously in gastrointestinal surgeries. A double-blind randomised controlled trial was conducted to determine the effect of intravenous lidocaine in total knee arthroplasty (TKR). The primary outcome was pain. Secondary outcomes included opioid consumption, range of movement, walking distance, local anaesthetic systemic toxicity (LAST), constipation, and functioning score.

Methods: Thirty patients having unilateral TKR were randomly assigned to a bolus of intravenous lidocaine (2 mg/kg) or placebo before skin incision. All patients received standardised spinal anaesthesia, local infiltration analgesia, and postoperative analgesic regimen. Pain during movement and rest were measured by numerical rating score (NRS). Cumulative opioid consumption, active and passive range of movement of the knee, walking distance, occurrence of LAST, constipation, and Modified Barthel Index were measured until discharge. Mann-Whitney *U* test was used for numerical values and Chi-square or Fisher's exact test categorical data.

Results: Statistically significant reduction in NRS was observed in the treatment group at 1 day after surgery ($p=0.025$; median [95% confidence interval] of 0.69 [-0.24-1.63] vs 2.5 [1.33-3.67]). Numerical rating score was also lower in the treatment group at 2 days ($p=0.156$; 1.46 [-0.09-3.01] vs 3 [1.34-4.66]) and 3 days ($p=0.768$; 1.2 [-1.49-3.89] vs 1.8 [0.23-3.37]) after surgery. Lower cumulative opioid consumption ($p=0.909$; 1.5 [0.05-2.95] vs 1.69 [0.03-3.35]) was noted as well. Postoperative range of movement, walking distance, Modified Barthel Index, and incidence of constipation was comparable. No LAST was recorded.

Conclusion: Pre-emptive bolus of intravenous lidocaine may reduce postoperative pain without risk of LAST.

FP2.2

Tranexamic Acid Administration in Primary Total Hip Arthroplasty: A Randomised Controlled Trial of Intravenous Combined with Intra-articular versus Two-Dose Intravenous Administration

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FP2.3

Combined Periarticular and Intravenous Steroid Injection Reduce Early Postoperative Pain after Total Knee Arthroplasty: A Prospective Double-blinded Placebo-controlled Randomised Controlled Trial

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FP2.4

Combination Effect of High-dose Preoperative and Periarticular Steroid Injection in Total Knee Arthroplasty: A Randomised Controlled Study**V Chan,¹ PK Chan,¹ T Chan,² A Cheung,¹ CH Yan,¹ KY Chiu¹**¹*Department of Orthopaedics and Traumatology, Queen Mary Hospital, Hong Kong*²*Department of Anaesthesiology, Queen Mary Hospital, Hong Kong*

Introduction: Postoperative pain remains a major obstacle to recovery after total knee arthroplasty (TKA). Periarticular corticosteroid in local infiltration analgesics and high-dose intravenous corticosteroid have individually been shown to improve pain control. However, potential interactions between them have not been investigated. We aimed to evaluate any combination effect of both routes of corticosteroid in TKA.

Methods: This was a double-blind paired randomised controlled study involving one-stage bilateral TKA. All received 16 mg dexamethasone intravenously before spinal anaesthesia. One knee was randomised to receive periarticular 40 mg triamcinolone, in addition to standard local infiltration analgesics. For each patient, one knee was affected by intravenous steroid only (IVS group), while the other was under the combined effect of intravenous and periarticular steroid (IVPAS group). Knee pain, Southampton wound, and functional scores were documented up to 1 year and compared between knees of the same patient.

Results: A total of 44 patients were included. Patients in the IVPAS group showed significantly lower visual analogue scale score during activity from day 1 to 6 weeks ($p < 0.05$) and a larger active range of movement from day 2 to 4 ($p < 0.05$). Patients in the IVPAS group were able to achieve active straight leg raise earlier than patients in the IVS group (1.6 vs 2.3 days, $p < 0.05$). There were no differences in Southampton wound and functional scores (Knee Society Knee score and Oxford Knee scores) up to 1 year after surgery.

Conclusion: To the best of our knowledge, this is the first report to demonstrate a combination effect between intravenous and periarticular steroids in TKA. Combining corticosteroids from both routes improved pain control and recovery with no increase in wound complications.

FP2.5

Comparison of Clinical Outcome of Total Knee Arthroplasty with Intra-operative Periarticular Cocktail Injection Regimes with Non-steroidal Anti-inflammatory Drugs versus Corticosteroid

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Introduction: There are many different regimes of intra-operative periarticular analgesia during total knee arthroplasty (TKA) reported in the literature. The two regimes used in our centre contains non-steroidal anti-inflammatory drug (NSAID) [36.5 mL normal saline, 10 mL 1% ropivacaine, 2.5 mL 1:10 000 epinephrine, and 1 mL ketorolac 30 mg/mL, make up to 50 mL] and corticosteroid (36.5 mL normal saline, 10 mL 1% ropivacaine, 2.5 mL 1:10 000 epinephrine, and 1 mL triamcinolone acetonide 40 mg/mL, make up to 50 mL). The choice of periarticular analgesic cocktail regime depends on factors such as allergic history, renal function, and concurrent drug use. This study aimed to compare the clinical outcomes of the two cocktail regimes.

Methods: Data from patients who underwent TKA for primary knee osteoarthritis in 2017 and 2018 were retrospectively retrieved. Outcomes including pain score, range of motion in the early postoperative period, and first outpatient follow-up examination results were compared among groups of subjects receiving NSAID, corticosteroid, and both. Incidence of wound complications, infection, and revision of TKA was also compared among those groups.

Results: There were no significant differences in range of motion, pain control, or length of stay among the groups at any studied postoperative time. There were also no statistical differences in the incidences of wound complications, wound infection, or periprosthetic infection. There were no revisions of TKA.

Conclusion: The two intra-operative periarticular analgesic cocktail regimes for TKA are equally effective for pain control and functional recovery. There is no increased risk of wound complication or infection for regimes containing corticosteroid.

FP2.6

Robotic Arm-Assisted Hip and Knee Arthroplasties: Early Experience with Adoption in a Single Centre

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Hip and knee arthroplasty surgeries have been successful in improving patients' quality of life by restoring function and reducing pain. Despite efforts to improve clinical outcomes, the surgeon factor remains an important area of focus in patients' short- and long-term survival. Component malpositioning is often associated with early revisions. Owing to the importance of such controllable surgeon factors, there has been a growing interest in the development of technologies to enable a tighter control of intra-operative variables. More recently, the use of robotic systems in joint arthroplasty have gained popularity, with a growing body of evidence demonstrating improved surgical accuracy and precision in component positioning and soft tissue balance. However, data on patient survival and other clinical outcomes remain elusive. In this case series, we report our early experience with the Mako (Stryker Corp, Mahwah [NJ], United States) robotic arm interactive orthopaedic system in hip and knee arthroplasty procedures (6 total hip arthroplasties, 13 medial unicompartmental knee arthroplasties, 5 total knee arthroplasties, 1 lateral unicompartmental knee arthroplasty, 2 patellofemoral joint replacements, and 2 bicompartamental knee replacements). Clinical performance scores and postoperative component positions were evaluated. Operating times, length of stay, intra-operative technical problems, and complications were also recorded. Improvement in clinical outcome scores was observed in the majority of our patients and acceptable accuracy was observed in acetabular cup and tibial tray placements. There are potential benefits of robotic arm-assisted arthroplasty; however, surgeons must be aware of the limitations, potential complications, and associated learning curve when adopting this technology.

FP2.7

Early Experience with Robotic Arm-Assisted Surgery in Knee Arthroplasty

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Introduction: Total knee arthroplasty (TKA) for knee osteoarthritis is associated with low morbidity and mortality, and its effectiveness in reducing joint pain and improving range of motion is well established. Previous studies suggested that malalignment of the total knee prosthesis can result in increased polyethylene wear, prosthesis loosening, and early failure. This resulted in a substantial investment in technology to achieve better alignment outcomes. We reviewed our early experience with the NAVIO robotic arm-assisted system in TKA.

Methods: Since October 2018, we have performed 20 NAVIO robotic arm-assisted TKAs in 16 patients. There were 17 TKAs and 3 unicompartmental knee arthroplasties with a mean age of 70 years old. All of the cases were varus osteoarthritis of the knee. Outcome measurements were the position of the prosthesis, complication rate, and length of hospital stay.

Results: The mean tourniquet time was 110 minutes, the mean Knee Society Score improved from 37.6 to 94.4 and the Knee Society Function Assessment score improved from 63.8 to 84.1. There was no postoperative complication and no patient required a blood transfusion. The mean length of stay in hospital was 4.2 days. Knee alignment was measured before surgery as hip-knee angle 169°; and after surgery as hip-knee angle 178°, femoral coronal angle 93°, tibia coronal angle 88°, and posterior slope 4°.

Discussion: From our early experience, the NAVIO system was able to achieve optimal alignment following knee arthroplasty within 3° from the neutral axis. The learning curve and operating time can be reduced with familiarity with the system. However, the long-term clinical outcomes remain unclear.

FP2.8

Robotic Arm-Assisted Total Hip Replacement: Assistant and Mentor

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Introduction: Acetabular cup placement is vital in minimising dislocation and ensuring implant longevity in total hip arthroplasty (THA). After preoperative planning on computed tomography scans, robotic arm assistance (Mako) enables accurate acetabular bone removal and allows precise cup placement. This study compared the accuracy of cup placement between manual and robotic arm guidance.

Methods: Twenty-five consecutive patients undergoing robotic THA by a single surgeon were included. All surgeries were performed using posterior approach with robotic arm-assisted acetabular reaming done by the surgeon. The surgeon, fellows, and trainees were then asked to manually position an acetabular trial into the acetabulum, attached to the robotic arm but with measurements covered. They were instructed to aim for an inclination of 40° and anteversion of 20° free of constraints. True acetabular cup was then impacted. Postoperative radiographs, intra-operative verification, and preoperative planning were compared for consistency.

Results: Seventy-five manual trial cup positioning attempts were made by the surgical team. Manual cup positioning yielded a mean inclination of 40° (standard deviation=6.98°) while mean anteversion was only 16.2° (standard deviation 8.1°) despite aiming for 20°. The surgeon improved in consistency and accuracy after a learning curve of nine cases. Intra-operative verification of cup position correlated strongly with preoperative planning in both inclination ($r=0.67$, $p=0.0003$) and anteversion ($r=0.75$, $p=0.0002$). After exclusion of six rotated radiographs, postoperative anteversion correlated strongly with planning ($r=0.56$, $p=0.018$) and intra-operative verification ($r=0.6$, $p=0.014$).

Conclusions: Manual acetabular cup positioning tends to produce small anteversion and a robotic arm is an excellent teacher to improve accuracy. Robotic assistance guarantees accurate cup position according to plan.

FP2.9

Robotic Arm-Assisted Cementless Cruciate Retaining Total Knee Arthroplasty without Tourniquet: Learning Curve of a Master Surgeon

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Introduction: Cementless total knee arthroplasty (TKA) can potentially improve implant survivorship for young active patients. Robotic arm improves bone cut precision facilitating cementless fixation, coupled with intra-operative gap balancing this may improve outcomes.

Methods: We analysed the learning curves of the first 25 cases of robotic arm-assisted TKA performed between 11 January and 23 May 2019. All surgeries were performed by a single surgeon (KYC) using Mako total knee application with medial parapatellar approach, without tourniquet, using a cementless cruciate retaining implant. 25 Chinese patients, all with primary knee osteoarthritis were included. Mean age was 66 years and 14 were female. Mean preoperative alignment was 11° varus.

Results: Significant reduction in total operating time was noticed between the first 10 cases, second 10 cases, and last 5 cases, with mean operating time of 100, 75, and 60 minutes, respectively ($p < 0.004$). Between the first 10 cases and subsequent cases, significant reductions were observed in time for draping and calibration (22 vs 7 minutes, $p = 0.00002$), insertion of trackers and leg holder (9 vs 5 minutes, $p = 0.00005$), registration (13 vs 8 minutes, $p = 0.00015$), soft tissue balance and planning (10 vs 6 minutes, $p = 0.0003$), bone cuts (20 vs 10 minutes, $p < 0.00001$), and trial (17 vs 11 minutes, $p = 0.0063$). Preoperative computed tomography was 100% predictive of actual component sizing. All knees achieved active straight leg raise on day 1. There was one case of distal deep venous thrombosis and one case of superficial wound infection.

Conclusion: Once the learning curve has passed, robotic arm-assisted TKA can average 60 minutes, which is faster than navigated TKA (84 minutes) and conventional cemented TKA (64 minutes).

FP2.10

Learning Curve Associated with Robotic Arm-Assisted Unicompartmental Knee Arthroplasty — a Prospective Cohort Study

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Aims: The primary aim of this study was to determine the surgical team's learning curve for introducing robotic arm-assisted unicompartmental knee arthroplasty (UKA) into routine surgical practice. The secondary objective was to compare accuracy of implant positioning in conventional jig-based UKA versus robotic arm-assisted UKA.

Methods: This prospective single-surgeon cohort study included 25 consecutive conventional jig-based UKAs compared with 25 consecutive robotic arm-assisted UKAs for medial compartmental knee osteoarthritis. Patients undergoing conventional UKA and robotic arm-assisted UKA were well-matched for baseline characteristics including mean age, mean body mass index, sex, and preoperative deformity. Surrogate measures of the learning curve were prospectively collected. These included operating times, accuracy of implant positioning, limb alignment, and postoperative complications.

Results: Robotic arm-assisted UKA was associated with a learning curve of 10 cases for operating time. Cumulative robotic experience did not affect accuracy of implant positioning, posterior tibial slope, native joint line preservation, and postoperative limb alignment. Robotic arm-assisted UKA improved accuracy of femoral and tibial implant positioning with no additional risk of postoperative complications compared to conventional jig-based UKA.

Conclusion: Robotic arm-assisted UKA has a short learning curve. The learning curve does not affect the components positioning and postoperative lower limb alignment.

FP2.11

Short-term Clinical and Radiological Outcomes of a Guided-motion Bicruciate-substituting Total Knee System in Chinese Patients

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Introduction: The JOURNEY II Bi-Cruciate substituting total knee system is a second-generation guided-motion knee implant. We looked at the short-term clinical and radiological outcomes in Chinese patients.

Methods: Data for 110 primary total knee arthroplasties (TKAs) performed in three hospitals under one university health system were reviewed. The pre- and post-operative knee and lower limb standing radiographs were used to measure the change in lower limb alignment and component positioning. Knee Society Score (KSS) and Knee Society Function Score (KFA) were used for clinical assessment. Complications were documented.

Results: A total of 110 TKAs were performed in 97 patients (71 females, 26 males). The average age was 68.7 years (range, 49-87 years). Patellae were not resurfaced. The mean follow-up time was 1.5 years. At the latest follow-up, KSS and KFA showed significant improvement compared with the preoperative value. The radiological assessments showed satisfactory restoration of mechanical alignment and components positioning. There was no major complication or revision documented.

Conclusion: The second-generation guided-motion bicruciate-substituting total knee implant demonstrated satisfactory short-term outcomes in Chinese patients.

FP2.12

High Body Mass Index Association with Poor Outcome in Total Knee Arthroplasty: A Retrospective Review in Chinese Population

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FP2.13

Societal Cost of Total Knee Replacement for End-stage Knee Osteoarthritis: A Pilot Cost-effectiveness Analysis in Hong Kong

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Introduction: Total knee replacement (TKR) for end-stage osteoarthritis improves pain control and debilitation. The present study aimed to investigate whether this is a cost-effective procedure.

Methods: In total, 431 cases of TKR in our dedicated joint replacement centre in 2013 were reviewed. A Markov model was used to estimate the value of TKR by comparing direct medical costs between surgical and non-surgical treatment scenarios. Direct medical costs and quality of life measures were incorporated into the Markov model to estimate the impact of TKR on costs over patients' lifetimes and quality-adjusted life years (QALYs). Generic (SF-12) and osteoarthritis-specific quality of life measured over 24 and 60 months, model-based QALYs, costs, and incremental cost-effectiveness ratios (ICER) were measured.

Results: Compared with non-surgical treatment, TKR increased lifetime direct costs by a mean of HK\$80 624 (net present value in 2018). There are significant improvements in both quality of life scores and functional scores: 11.54 for SF-12 physical component summary and 5.74 for SF-12 mental component summary; -36.49 for Western Ontario and McMaster Universities Arthritis Index; and 22.24 for Knee Injury and Osteoarthritis Outcome Score. The average gain in utility value (SF-6D) was 0.10 and the QALY gained was 0.154. The threshold analysis showed an ICER of HK\$778 000 per QALY, which is well below the established United States cost-effectiveness thresholds.

Conclusion: Total knee replacement for end-stage osteoarthritis in our joint replacement centre was shown to be a cost-effective procedure.

FP2.14

Total Knee Arthroplasty for Elderly Patients in the Era of Fast-track Surgery

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Introduction: Total knee replacement (TKR) in the elderly population is becoming increasingly prevalent. This study aimed to compare perioperative and rehabilitation outcomes of patients aged ≥ 80 years with those aged < 80 years at time of TKR.

Methods: A total of 423 TKR surgeries were performed in those aged ≥ 80 years (≥ 80 group) between 2009 and 2018. A control group aged < 80 years was established. Perioperative mortality, complications, 30-day all-cause readmissions to hospital, length of stay, and rehabilitation parameters were recorded.

Results: Mean age at surgery was 82.7 (standard deviation 2.5; range 80-93) years for ≥ 80 group and 69.3 (standard deviation 7.6; range 37-79) years for the control group. Postoperative Knee Society Function Assessment scores were higher in the control group (49 vs 57, $p=0.003$). Mean length of stay was longer in the ≥ 80 group (17.2 vs 12.4 days, $p<0.01$). Mortality within 3 months of surgery was 0.014% in the ≥ 80 group and 0% for the control group. Incidence of complications was comparable between the two groups at 12.8% and 12.9% for the ≥ 80 and control groups, respectively ($p=0.962$).

Conclusion: The length of stay was longer in the ≥ 80 group, likely related to higher levels of comorbidity. Complications were just as common among the two groups but were more severe in the elderly group. Mortality rate after TKR was very low even in those aged ≥ 80 years. Younger patients benefit more in terms of functional improvement after TKR. The TKR is a safe and efficacious procedure even in the elderly patients. More severe complications, longer length of stay, and smaller gains in functional improvement can be expected for patients aged ≥ 80 years, compared with those aged < 80 years.

FP2.15

Fast Track versus Conventional: Evaluation on Efficacy and Safety of Fast-track Total Knee Arthroplasty Programme in Queen Mary Hospital

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FP2.16

Safety of One-stage Bilateral Total Hip Arthroplasty in Hong Kong

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Introduction: One-stage bilateral joint arthroplasty has become increasingly common worldwide. In Hong Kong, there is an increasing number of one-stage bilateral total knee arthroplasty being performed. However, one-stage bilateral total hip arthroplasty (THA) is still uncommon in Hong Kong, with safety being a primary concern. The present study aimed to investigate the safety of one-stage bilateral THA.

Methods: From March 2017 to June 2019, 10 patients underwent one-stage bilateral THA in Prince of Wales Hospital. Patients' demographic data, operative details, and perioperative complications were assessed.

Results: Five men and five women (mean age 58.5 years, range 34-71 years) were included. The American Society of Anesthesiologists grading was 1 in two patients, 2 in six patients, and 3 in two patients. Cementless THA was performed using a lateral approach in all patients. Intravenous tranexamic acid was infused to decrease blood loss in all patients. Postoperative blood transfusion was required in four patients. All patients experienced pain relief after THA. There were no perioperative complications noted. The average length of stay was 6.4 days (range, 4-10 days).

Conclusion: The incidence of blood transfusion in one-stage bilateral THA was high (40%) despite the use of tranexamic acid. However, there were no other major complications noted in all 10 patients. Liaison with the anaesthetist to carefully select appropriate patients can achieve a safe outcome in one-stage bilateral THA in Hong Kong.

FP2.17

Cementless Total Hip Replacement in Patients with Inflammatory Arthropathy: A 10-Year Retrospective Study

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Introduction: Inflammatory arthropathy predisposes patients to negative biomechanical changes in bone, potentially increasing risk of mechanical complications with cementless implants. However, recent studies have suggested that cementless implants perform as well as cemented implants. The objective of the present study was to determine the survival of cementless implants in Chinese patients with inflammatory arthropathy.

Methods: This was a retrospective cohort study including all patients with inflammatory arthropathy who underwent primary cementless total hip arthroplasty at the Prince of Wales Hospital in a 10-year period. Survival analysis was performed to estimate incidence of revision.

Results: A total of 30 inflammatory arthropathy hips (n=30 total hip replacement (THR); 22 patients) received primary cementless total hip replacement with a minimum 10-year follow-up. Patients were 9 men and 13 women with mean age at surgery of 42.5 (standard deviation 13.4) years. Nine patients had rheumatoid arthritis (RA), 10 ankylosing spondylitis (AS), 2 systemic lupus erythematosus, and 1 with both RA and AS. One patient was complicated with fracture over the calcar which was fixed with cerclage wiring. Four patients died from medical-related diseases (n=6 THR). One patient had bilateral insert wear requiring revision (n=2 THR). One patient had loosened right acetabular cup but stable left THR (n=2 THR). Four patients had non-progressive radiolucency around femoral stem with no subsidence and asymptomatic (n=5 THR). One patient had insert wear but static and asymptomatic (n=1 THR). The remaining 11 patients had stable implants (n=14 THR).

Conclusion: Cementless THR was stable with low rate of mechanical complications. Cementless implants for inflammatory arthropathy is a feasible option for patients with inflammatory arthropathy.

FP2.18

Clinical and Social Outcome of Conversion Arthroplasty in Failed Fixation of Hip Fracture: A Matched Case–Control Study

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Introduction: Conversion arthroplasty is the salvage procedure for failure of fixation of hip fracture. The aim of the present study was to investigate the clinical and social outcome of conversion arthroplasty.

Methods: All patients with failed internal fixation with conversion arthroplasty performed in 2012 to 2018 were retrospectively reviewed. Patient demographics, type of fracture, method of primary fixation, type of conversion surgery, type of implant, complications, length of stay, and outcomes were analysed. Successful internal fixation of hip fractures in the same period were recruited as a control group with 1:2 ratio, matching for age, sex, premorbid walking status, and type of fracture. Comparative analysis between the failure cases and controls was performed to assess the differences in clinical and social outcome.

Results: There were 1272 cases of fracture hip fixation within the study period. Eighteen cases had failure with conversion arthroplasty (1.42%), including 2 (11.1%) with Thompson, 4 (22.2%) modular unipolar hemiarthroplasty, 9 (50%) bipolar hemiarthroplasty, and 3 (16.7%) total hip replacement. The mean age of the patients was 83 years. The conversion group was associated with longer operating time, higher haemoglobin drops, higher perioperative transfusion rate, and higher risk of overall and surgical complications. The commonest surgical complication in the conversion group was hip dislocation. Residual hip pain was significantly more in the conversion group. There were no significant differences in the length of stay, ability to walk with assistance, and institution rate between the conversion group and control group.

Conclusion: Conversion arthroplasty is a demanding procedure in associated with higher overall and surgical complications.

FP2.19

Outcome of Dual-mobility Bearings in Total Hip Arthroplasty in Chinese Patients: A Retrospective Review

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FP2.20

Failure Mode of Total Hip Replacement: A 21-Year Retrospective Study of over 300 Revision Total Hip Replacements

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Introduction: In 1999, our department published data regarding the cause, complication, and survival of revision total hip replacement (THR). Since then, highly cross-linked polyethylene has been introduced, potentially changing the survival of THR. Therefore, we aimed to review our latest data in order to determine any change in the mode of failure of THR and survival after revision THR and to compare the latest results with our previous study.

Methods: All revision THR surgeries at a tertiary teaching hospital from 1998 to 2018 were reviewed. Kaplan-Meier survival analysis was performed to predict the cumulative rate of success for revision THR. The results were compared to our previously published data collected from 1984 to 1997.

Results: A total of 331 revision THR surgeries were performed on 277 patients. The average time interval between primary and revision was 13.2 years and the average follow-up after revision was 8.7 years. The commonest reason was mechanical loosening (41.7%) followed by articular bearing surface wear (39.0%), infection (10.0%), and periprosthetic fracture (3.9%). There were 92 (27%) cases of complication including dislocation (9.4%), infection (5.1%), and periprosthetic fractures (3.6%). There were 39 (11.8%) hips that underwent re-revision. The Kaplan-Meier survival analysis predicted cumulative survival of 95.2% at 5 years and 88.9% at 10 years.

Conclusion: We demonstrated a significant increase in revision for polyethylene wear as mode of failure in late revisions, despite the introduction of highly cross-linked polyethylene which eliminates the issue of polyethylene wear.

FP2.21

Porous Metal Acetabular Components in Revision Total Hip Arthroplasty: \geq 5-Year Follow-up of 24 Patients

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Introduction: Severe acetabular bone loss has been a major difficulty in revision total hip arthroplasty (THA). Porous metal acetabular revision system provides solution for insufficient host-bone contact.

Methods: Twenty-four patients who underwent revision THA using Trabecular Metal (Zimmer) acetabular revision system were reviewed after minimum follow-up of 5 years. The most common causes of revision were aseptic loosening, polyethylene wear with osteolysis, and periprosthetic joint infection. Trabecular metal cup alone, trabecular metal cup with augment, and cup-cage construct were used in 12, 8, and 4 hips, respectively.

Results: After a mean follow-up of 9 years (standard deviation 2.6, range 6-14 years), 23 (96%) patients had excellent outcomes in functional and radiological assessments. All patients had significant improvement in Harris Hip Score after operation. No acetabular component loosening was found. No re-revision surgery was performed for mechanical failure of acetabular component. One (4%) patient had asymptomatic insert wear without osteolysis. Two (8%) patients had periprosthetic joint infection, which was successfully treated with debridement, antibiotics, and implant retention. One (4%) patient had superficial wound infection, which was successfully treated with incision and drainage.

Conclusion: A longer period of follow-up is needed to evaluate the long-term outcome of the use of porous metal acetabular shell. Our data suggest the use of porous metal acetabular shell to be considered a safe technique with excellent outcome to tackle the difficulty of massive bone loss during revision THA.

FP2.22

Universal Haemoglobin A1c Screening Reduce Periprosthetic Joint Infection in Primary Total Knee Arthroplasty

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Introduction: Diabetes mellitus is an established modifiable risk factor for periprosthetic joint infection (PJI). Haemoglobin A1c (HbA1c) is a glycaemic marker that correlates with diabetic complications and PJI. As diabetes and pre-diabetes are frequently asymptomatic and increasing evidence to suggest linkage with osteoarthritis, it is reasonable to provide HbA1c screening before total knee arthroplasty (TKA). With HbA1c screening, we aimed to investigate the prevalence of undiagnosed dysglycaemia in TKA patients, and whether such practice can reduce PJI.

Methods: All TKAs from March 2017 to May 2019 had HbA1c screening were reviewed. Pre-diabetes and diabetes were defined according to the American Diabetes Association. Patients with HbA1c \geq 7.5% were referred to an endocrinologist for optimisation before TKA. The PJI rates were compared with histological control with no HbA1c screening. All PJIs were defined according to the Musculoskeletal Infection Society working group in 2011.

Results: In total, 729 patients (934 TKAs) had HbA1c screening before TKA. Prevalence of known pre-diabetes and diabetes was 2.3% and 25.2%, respectively, while 36.4% and 1.6% had undiagnosed pre-diabetes and diabetes. We only needed to screen three patients during pre-TKA assessment to detect one patient with undiagnosed dysglycaemia. Periprosthetic joint infection rates were significantly lower in HbA1c screening TKAs (0.2% vs 1.0%, $p=0.018$).

Conclusion: In all, 38% of patients scheduled for TKA had undiagnosed diabetes or pre-diabetes. Haemoglobin A1c screening before TKA provides a cost-effective opportunity to identify undiagnosed dysglycaemia. Universal HbA1c screening and optimisation before TKA was effective in reducing PJI.

FP2.23

Optimal Timing for Checking Glucose Level after Total Knee Arthroplasty in Patients with or without Diabetes**V Chan, PK Chan, H Fu, MH Cheung, CH Yan, KY Chiu***Department of Orthopaedics and Traumatology, Queen Mary Hospital, Hong Kong*

Introduction: Perioperative hyperglycaemia is an important risk factor for periprosthetic joint infection. However, controversies exist in the hyperglycaemic threshold and the optimal timing of glucose measurements. The primary aim was to determine the best timing of glucose measurement to detect hyperglycaemia. The secondary aim was to characterise the postoperative glucose profile and whether preoperative glucose control predicts postoperative hyperglycaemia.

Methods: Primary total knee arthroplasty (TKA) from January to May 2019 were reviewed. Postoperative glucose was measured on day (D)0 at 5 pm and 10 pm and on D1 and D2 at 7 am and 5 pm. Hyperglycaemia was defined using strict (7 mmol/L), intermediate (7.6 mmol/L), and lenient (10.8 mmol/L) thresholds.

Results: Seventy-six primary TKA patients reviewed. Hyperglycaemia on D0 at 10 pm for 7.6 mmol/L and 10.8 mmol/L thresholds was 100% and 78%, respectively and were significantly higher than other time points ($p=0.009$; $p=0.001$). Mean postoperative glucose peaked on D0 at 10 pm, then gradually tail down for diabetes, pre-diabetes, and non-diabetes. On D1, glucose values were significantly higher in diabetes and pre-diabetes than non-diabetes ($p=0.003$). On the night of surgery (D0 at 5 pm and 10 pm), glucose levels were not significantly different between diabetes, pre-diabetes, and non-diabetes. The haemoglobin A1c level was linearly correlated with both maximum and mean postoperative glucose ($p<0.0001$) with an R^2 value of 0.304 and 0.325, respectively.

Conclusion: Checking glucose at 10 pm on D0 was most sensitive to detect hyperglycaemia. Although patients with diabetes were at higher risk of postoperative hyperglycaemia, patients without diabetes were also susceptible to postoperative hyperglycaemia at this time. Optimising preoperative haemoglobin A1c is associated with lower postoperative glucose levels.