

Introduction & Aims: The purposes of this study were to characterize the pathological changes to in the infrapatellar fat pad (IPFP) with Patellar tendinopathy (PT), and to quantitatively investigate the influence of PT on the development of fibrotic changes in the IPFP using a histological rat PT model.

Method: Forty Wistar male rats were randomly divided into two groups: the PT group (N=20) and the control group (N=20). Bacterial collagenase I (PT group) or saline (control group) was intratendinously injected into the patellar tendon. Rats were sacrificed at week 12. The whole knee joint was sectioned sagittally and stained with hematoxylin-eosin and Masson's trichrome. IPFP samples were graded according to cellularity, fibrosis and vascularity. Each criterion received a grade between 0 and 3. The area of the whole IPFP and the blue-stained area were measured. The Mann-Whitney U-test was used for statistical analysis of the variables.

Results: Significant differences in cellularity, fibrosis, and vascularity scores were found between the two groups. Cellularity scores were 2.2 ± 0.7 for the PT group and 0.9 ± 0.3 for the control group ($p < 0.01$). The mean fibrosis scores were 1.5 ± 0.7 for the PT group and 0.4 ± 0.2 for the control group ($p < 0.01$). The mean vascularity scores were 2.1 ± 0.5 for the PT group and 1.2 ± 0.4 for the control group ($p < 0.01$). There was also a significant difference in the total scores for the PT group and the control group (5.8 ± 1.8 and 3.2 ± 0.8 , respectively; $p < 0.01$). The average percentages of the blue-stained area of the collagen fibres area in comparison with the whole IPFP area were $38.2\% \pm 26.5\%$ for the PT group and $11.2\% \pm 3.9\%$ for the control group ($p < 0.01$).

Conclusions: With PT, the IPFP showed greater cellularity, fibrosis, and vascularity, and the fibrotic changes were more severe when compared with those of controls. An intervention to suppress the excessive inflammatory response of the IPFP may help to maintain the normal biochemical and biomechanical functions of the IPFP.

PATTERN OF PITCH-SIDE SPORTS INJURY MANAGEMENT IN A UNIVERSITY LEVEL – A ONE-SEASON OBSERVATIONAL STUDY

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Introduction & Aims: Sports injuries is a great challenge for university athletes to sustain active sports participation, thus introduction of qualified clinical sports trainer (CST) into sport teams who are capable of being first-line identification and management of injuries on pitch-side may soothe the problem. Limited studies investigated the effect of introducing CST on pitch-side injuries.

Method: Injury record form gathered from the university sports team's representative in the Chinese University of Hong Kong (CUHK) were completed by CST attached to teams, including soccer, basketball, volleyball, handball and rugby with a total of 218 athletes, information was collected from university athletes ($n=46$, age, 21.0 ± 1.8) that requested consultation during training or competitions. The information collected was used to investigate on sports injury pattern as well as sport injury immediate management pattern of the university athletes.

Results: Regarding sports injury pattern in university setting, there was slightly higher visiting rate by male (52.2%) than female (47.8%). The most frequently injured body-part is the lower extremity (55.5%), followed by upper extremity (31.1%) and head injuries were relatively less common (2.2%). Severity of most injuries were mild (82.2%) with the commonest injury being sprain (43.5%) and overuse injury (26.1%), while acute swelling was relatively less common (2.2%). The commonest cause was due to overuse (26.7%) followed by contact with other players (22.2%).

Moreover, concerning the sports injury immediate management pattern, majority of the injuries reported did not need referral to medical professionals for example physiotherapist or doctors (68.9%) and were able to return to play (53.3%) right after the immediate consultation and management by CST after sideline TOTAPS assessment [3]. Taping (26.1%) and the RICER protocol (24.0%) were of the most frequently adopted method by the CST as the pitch-side initial treatment.

Conclusions: Over half of the complains did not require referral to medical professionals with presence of CST to help with sideline injury assessments, and players were able to return to play after immediate handling. Further investigation is needed on whether presence of CST can help to

reduce long term injury rate.

6- AND 12-MONTH RESULTS OF A PROSPECTIVE, MULTI-CENTER, RANDOMIZED, TRIAL COMPARING SAFETY AND EFFECTIVENESS OF COOLED RADIOFREQUENCY ABLATION TO CORTICOSTEROID INJECTION FOR MANAGEMENT OF OSTEOARTHRITIC KNEE PAIN

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Introduction & Aims: Osteoarthritis (OA)-related knee pain causes disability in the aging population. This study compared the safety and effectiveness of cooled radiofrequency ablation (CRFA) to intraarticular steroid injection (IAS) to treat OA-related knee pain.

Methods: Qualifying patients underwent single diagnostic block injections to the superomedial and inferomedial branches of the saphenous nerve, and the superolateral branch of the femoral nerve. Patients with pain relief $\geq 50\%$ were randomized to receive CRFA at the same three anatomic sites ($n = 67$), or a single IAS injection ($n = 71$). Patients were evaluated at 1, 3, and 6-months post-treatment. Six months after IAS injection, participants could "cross-over (XO)" to CRFA ($N = 58$), and were followed for an additional 6 months. The original CRFA study subjects were followed for a total of 12 months.

Results: The two study groups were demographically homogeneous at baseline. At 6 months, 74.1% of the CRFA group had $\geq 50\%$ reduction in the Numeric Rating Scale (NRS) pain score vs. 16.2% in the IAS group ($p < 0.001$, primary endpoint). Mean 6-month NRS score reductions were 4.9 (CRFA) and 1.3 (IAS). Mean Oxford Knee Scores (OKS) were 35.7 ± 8.8 in the CRFA group vs. 22.4 ± 8.5 in the IAS group ($p < 0.001$). Global Perceived Effect (GPE) improvements were 91.4% in the CRFA group and 23.9% in the IAS group ($p < 0.001$). At 12 months, mean NRS decrease from baseline was significant at 4.3 points. Sixty-five percent of the CRFA group had $\geq 50\%$ pain reduction and the mean increase in the OKS from baseline was 17.3 points ($p < 0.001$). Seventy-five percent reported "improved" effects from CRFA treatment. The cross-over group also responded favorably to treatment, demonstrating significant improvements from baseline ($p < 0.001$) in pain and function. No procedure-related serious adverse events occurred, and adverse event profiles were comparable.

Conclusions: Cooled RFA and IAS are similarly safe, but CRFA more effectively manages pain, physical function, and quality-of-life for patients with knee OA. Durable clinical effectiveness of CRFA for treating OA-related chronic knee pain and disability was demonstrated. The cross-over study subjects experienced significant pain relief and functional improvement.

KNEE BIOMECHANICS AFTER REPLACEMENT SURGERY (KBARS) – KINEMATIC AND ELECTROMYOGRAPHIC COMPARISON OF POSTERIOR-STABILISED, CRUCIATE-RETAINING AND MEDIAL-PIVOT DESIGNS DURING LOCOMOTION

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Introduction & Aims: Despite the promising clinical outcomes of the medial-pivot knee design reported to-date, fundamental questions regarding the in-vivo functional behaviour of the implant remain. The purpose of this study was to determine whether the tibiofemoral motion and electromyographic activity of the knee extensors and flexors differs in patients with a medial pivot implant, compared to those with cruciate-retaining or posterior-stabilised designs, during locomotion.

Methods: A cohort of patients ($n = 54$) that had undergone TKA a minimum of 12 months prior were split into 3 even groups ($n = 18$) based on implant type: medial-pivot (MP), posterior-stabilised (PS) and cruciate-retaining (CR). Knee kinematics were measured with a high-speed optoelectronic motion capture system (200Hz, Vicon Bonita/Nexus, USA) and surface electromyography with wireless sensors (Delsys Trigno, USA) of the rectus femoris, vastus lateralis, vastus medialis, biceps femoris and medial

hamstrings. Patients performed a step-ascent task onto an 18cm high block, and locomotion on a treadmill at a self-selected comfortable, and 30% faster walking speeds. Kinematic data were normalized to 0-100% of the weight acceptance phase for the step-ascent task (contralateral toe-off to contact), and the terminal swing phase for the locomotion task (87-100% of the gait cycle). Medians with 95% confidence intervals were generated for each dependent variable to allow for between-group comparisons. EMG signal amplitude for the step ascent task was expressed relative to an MVIC (%).

Results: In the step task, there was a significantly greater tibial rotation in the MP (11.7°, 9.1 – 13.8) and PS (10.5°, 8.3 – 11.2) groups, compared with the CR (7.4°, 5 – 9.2) group (both $p < 0.01$); there was no difference between MP and PS groups. This difference was not apparent in each of the locomotion tasks. Interestingly, all groups produced a median internal rotation, which contradicted the screw-home mechanism. The MP knees displayed significantly ($P < 0.01$) greater knee extensor activation (rectus femoris muscle) to achieve the step-ascent than the PS group.

Conclusion: These findings suggest that patients with either knee implant types are not strictly limited to producing the traditional screw-home mechanism, as previously reported. The present findings also suggest that the MP design does not necessarily encourage greater range of rotational movement during locomotion.

INCIDENCE OF DVT/PE BETWEEN ONE-STAGED BILATERAL AND UNILATERAL TKA USING CONTRAST ENHANCED CT AND VENOUS ULTRASONOGRAPHY IN JAPANESE PATIENTS - EDOXABAN AS CHEMICAL PROPHYLAXIS

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Introduction & Aims: TKA is one of the most successful surgeries to relieve pain caused by severe arthritis. Otherwise, it is still controversial that there is higher risk of DVT/PE in one-staged bilateral TKA. Therefore, we investigated incidence of DVT/PE after primary TKA by enhanced CT and venous ultrasonography (US) in Japanese Patients.

Method: One hundred fourteen patients who underwent primary TKA from January 2015 to June 2016 were applied. The mean age was 74.0 years. There were 105 cases of osteoarthritis and 7 of rheumatoid arthritis. A single knee surgery team performed all operations with cemented type prostheses. There were 47 cases of one-staged bilateral TKA and 67 of unilateral TKA. Enhanced CT and venous US were performed at the 4th day after surgery and images were read by a single senior radiologist team.

Results: Enhanced CT was performed in 90 patients (78.9%) and US was in all patients. The incidence of DVT was 67 patients (58.7%) and PE was 11 patients (9.6%). Then we compared the incidence between one-staged bilateral TKA group and Unilateral group. DVT was 30 (63.8%) and 33 (49.2%) respectively. PE was eight (17.0%) and three (4.4%) respectively. There was significant high incidence of PE in one-staged bilateral group. All patients with DVT/PE had no symptoms.

Conclusions: We prospectively investigated 114 patients for DVT/PE after primary TKA using enhanced CT and venous US. There was significant high incidence of PE in one-staged bilateral TKA group compared in unilateral group.

THE EFFECT OF KNEE REPLACEMENT DESIGN & POLYETHYLENE TYPE ON REVISION RISK FOR INFECTION. AN ANALYSIS FROM THE AOANJRR.

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Introduction & Aims: Infection of Total Knee Replacements (TKRs) remains devastating for patients and an increasingly significant burden on health care systems. While both TKR design and polyethylene type can

independently alter survivorship, their influence on infection revision risk is unknown. We examined the effects of TKR stability design and polyethylene bearing type on the long-term revision risk for infection in TKR by comparing Minimally Stabilized (MS) TKRs with Cross-Linked Polyethylene (XLPE) to MS TKRs with Non-Cross-Linked Polyethylene (NXLPE), Posterior Stabilized (PS) TKRs with XLPE and PS TKRs with NXLPE.

Methods: National registry revision data for infection in primary TKR for osteoarthritis were obtained from Sept 1999 to Dec 2015 for 4 patient cohorts defined by the TKR design and polyethylene type received. Revisions ≤ 6 months were censored. Analyses were stratified by age, sex and antibiotic cement usage.

Results: There were 336997 included primary TKR of which 1651 (0.48%) underwent revisions for infection. Compared to MS TKR-XLPE, the risk of revision for infection was 30% higher in MS TKR-NXLPE (HR=1.30 (95% CI 1.14, 1.50) $p < 0.001$), 97% higher for PS TKR-XLPE (HR=1.97 (95% CI 1.60, 2.44) $p < 0.001$), and 110% higher for PS TKR-NXLPE (HR=2.10 (95% CI 1.80, 2.44) $p < 0.001$). This effect was apparent in all males, all females, males ≤ 65 years, males ≥ 65 years, females ≤ 65 years and in those receiving antibiotic cement.

Conclusion: MS TKR with NXLPE bearing surfaces and PS TKR irrespective of bearing type have a greater long-term revision risk for infection when compared to MS TKR with XLPE.

WHAT IS THE BENEFIT OF OPTIMUM PROSTHESIS COMBINATION SELECTION IN TOTAL KNEE REPLACEMENT? AN ANALYSIS OF 482373 PROSTHESES FROM THE AUSTRALIAN ORTHOPAEDIC ASSOCIATION NATIONAL JOINT REPLACEMENT REGISTRY

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Introduction & Aims: Decades of innovations in total knee replacement (TKR) have led to large number of design and technique options, each of which can alter the revision risk. It is unknown what the accumulative effect is when the lowest risk option in each category, or “optimum prosthesis combination” (OPC) is utilized. The purpose of this analysis was to firstly identify the OPC, secondly, to analyze the effects on revision risk when the OPC was utilized compared to a cohort of patients who received an alternative prosthesis combination (APC), and finally, identify which patient age-sex cohorts had the greatest alteration in risk with the OPC.

Methods: National registry revision risk data for primary TKR for osteoarthritis were obtained from Sept 1999 to Dec 2015 for two patient cohorts, those receiving an OPC and those receiving an APC. OPC was defined as TKR that had the lowest revision risk option for six primary TKR design and technique categories; fixation, posterior stability, bearing mobility, bearing surface, alignment method and patella resurfacing, while APC had one or more higher-risk options.

Results: Of the 482,373 included TKR, 31,404 (6.5%) were in the OPC cohort, which was a TKR with a cemented tibia, was minimally stabilized, fixed bearing, had cross-linked polyethylene, was undertaken with computer navigation if the patients were < 65 yo and had patella resurfacing. At 10-years, the OPC cohort had a CPR of 2.4% (95% CI 2.1, 2.8) compared to 5.4% (95% CI 5.4, 5.5) for the APC cohort. The revision risk of the APC cohort was higher at all times (132% greater at ≥ 2 years ($p < 0.001$)), in all patient age and gender subgroups, with the greatest increase in risk in females ≥ 65 years. The APC cohort had a 35% higher risk of revision for infection than the OPC cohort at ≥ 1.5 years ($p = 0.047$).

Conclusion: The optimum prosthesis combination concept represents a pragmatic clinical decision-making tool to aid in the identification of the lowest revision risk TKR

ARE ROUTINE BLOOD TESTS REQUIRED AFTER TOTAL KNEE AND HIP ARTHROPLASTY?

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Introduction & Aims: Blood tests are routine in many institutions after