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### **Five-year Postoperative MRI Assessment Of Bone-replaceable Anchors Used For Arthroscopic Rotator Cuff Repair**

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**Introduction:** Currently, biocomposite anchors are often used in arthroscopic rotator cuff repair (ARCR). These anchors reportedly take approximately 2 years to be replaced by a bone; nonetheless, none of the cases encountered at our hospital exhibited complete degradation under magnetic resonance imaging (MRI) 2 years postoperatively. Therefore, our objective was to use MRI for evaluating the degree of degradation of these anchors used in ARCR at 5 years postoperatively.

**Materials and Methods:** The participants were selected from 53 patients who underwent ARCR at our hospital, and had MRI images captured from 2 years and 5 years postoperatively. We examined 38 anchors from 21 patients with possible complete repair, who did not experience a re-tear, and used a biocomposite anchor (HEALICOIL RG) in a single row or a dual row, including a suture bridge on the medial side. We evaluated the degree of degradation as grade 1 to 4 using the classification system proposed by Haneveld et al. Furthermore, we examined the degree of degradation (2 years and 5 years postoperatively) and the progression of degradation (up to 2 years and from 2 years to 5 years postoperatively).

**Results:** The bone had replaced the anchors by the classification system of Haneveld et al. by grade 1 and grade 2 in 35 anchors and three anchors, respectively, at 2 years postoperatively. By contrast, 13, 24, and one anchor were replaced by grade 2, grade 3, and grade 4, respectively, at 5 years postoperatively, thus revealing the replacement had significantly progressed at 5 years. However, almost no anchors had been completely replaced at 5 years. The progression of degradation persisted at grade 1 until 2 years, with all but three of the 35 anchors clearly visible at grade 1. From the year 2 to 5, 15 and 23 anchors displayed advanced 1 stage and 2 stages, respectively, with the stages of degradation significantly progressing during this period.

**Discussion:** Biocomposite anchors take approximately 2 years to be replaced by a bone; nonetheless, marginal degradation had occurred at 2 years in practice. The majority of the degradation occurred after 2 years, and we observed substantial progress after 5 years. However, the majority of anchors had not been completely degraded. Despite the steady degradation of biocomposite anchors in clinical practice, the degradation often requires at least 5 years.

**Conclusion:** We evaluated the degree of degradation of biocomposite suture anchors used in ARCR at 5 years postoperatively using MRI. Despite the steady replacement of biocomposite anchors by the bone in clinical practice, the replacement often requires at least 5 years.

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### **Cost Effective Alternative For Rotator Cuff Tear - A Case Report**

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**Introduction / Objectives:** Rotator cuff (RC) tears are common and is noted to have high correlation with advancing age. Different management techniques are available and among the surgical procedures, arthroscopy with anchor fixation, is now widely being used. The objective of this paper is to present a case of rotator cuff tear repaired with screw and suture technique and to show the effectiveness of this technique in terms of pain alleviation and improvement in range of motion and function. Despite diversity of treatment options, the clinical practice guidelines by the American Academy of Orthopaedic Surgeons (AAOS) that addresses the management of rotator cuff problems still are mostly inconclusive.

**Materials & Methods:** Presenting a 63 year old male who complained of right shoulder pain not related to trauma. Physical examination showed weakness of the supraspinatus and infraspinatus with positive impingement sign. Radiograph and ultrasound of the right shoulder showed complete full thickness tear of the supraspinatus tendon with calcific tendinosis. Magnetic Resonance Imaging (MRI) confirmed the diagnosis of supraspinatus and subscapularis tendinosis with a high-grade bursal surface tear at the supraspinatus tendon.

**Result/ Discussion:** Arthroscopic debridement, subacromial decompression and mini-open rotator cuff repair of the right shoulder were performed, with two (2) mattress sutures and fixed with two (2) 3.5 partially threaded cannulated screws as posts. Post-operatively, the shoulder of the patient was placed in an abduction sling for 6 weeks and early rehabilitation was initiated. Several months of follow up revealed initial recovery, then impeded by post-op stiffness, then the actual improvement after 8 months onwards. Patient claimed improvement in strength, alleviation of pain and improvement in function even after 33 months.

**Conclusion:** This paper presents a case of rotator cuff tear repair with screw and suture technique. Despite numerous advances in the management of this type of injury, this procedure demonstrated good results in terms of pain alleviation, restoration of mobility and improvement in daily function. The cost of the screw amounted to USD 100 compared to the other fixation which usually costs USD 800. In our setting, alternative method applying the same principles in the surgical treatment of RCTs, utilizing cheaper fixation will be beneficial for the patients since health care is a financial burden.

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### **Experience And Perceptions Of Philippine Orthopaedic Trainees On The Effect Of The COVID-19 Pandemic On Residency Training: A Nationwide Survey**

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**Introduction/ Objectives:** The coronavirus disease 2019 (COVID-19) was declared a pandemic by the World Health Organization on March 11, 2020. Since then, healthcare systems have been battling to ensure continuous provision of appropriate medical care. The main objective of the study was to determine the effect of COVID-19 pandemic on medical and surgical training as perceived by orthopaedic residents in the Philippines.

**Materials and Methods:** A survey using Google Forms was conducted among 345 orthopaedic residents from all 22 training institutions in the Philippines to determine the effect of COVID-19 pandemic on the medical and surgical training as perceived by the trainees. Clinical experience, teaching and education, health and safety, and overall satisfaction were the domains investigated.

**Result/ Discussion:** A total of 217 residents responded (response rate of 62.9%) and most were 26-30 years old (58.1%). There were more male respondents (75.5%) than female (24.5%). For the clinical experience, the percentage reduction in terms of emergency ( $p = 0.048$ ), elective ( $p < 0.001$ ), and outpatient cases ( $p = 0.001$ ) were statistically significant across the different hospitals. For teaching and education, the Zoom app was the most popular platform utilized (100%) and webinars, case conferences, didactic lectures, and mortality and morbidity conferences were continued. For the health and safety, 21 residents (9.7%) had COVID-19 infection during work and 35% underwent RT-PCR test after exposure to COVID-19 patients. Overall satisfaction rating of the respondents' respective departments and the Philippine Board of Orthopaedics in regard to addressing concerns in residency training had positive feedback among 93.5% and 87.1% of respondents, respectively, while 48% expressed unsatisfactory overall rating on the effect of COVID-19 pandemic on their residency program.

**Conclusion:** The COVID-19 pandemic had a negative impact on the medical and surgical training of the orthopaedic residents in the country. This poses a big challenge to the different training institutions to ensure quality and effective training in the midst of this pandemic and beyond.

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### **Medial Patellofemoral Ligament Reconstruction For Lateral Patellar Instability In A Transtibial Amputee**

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**Background:** Studies have shown that patellar instability among patients who underwent transtibial amputation is very common. Aside from the lateral patellar instability, it is also prudent to consider other potential factors such as injury to the medial patellofemoral ligament (MPFL). Even though surgical repair of the MPFL has the best outcomes with 80-90% success rate, there have been only 2 studies in the literature that reported MPFL reconstruction in patients with transtibial amputations.

**Objectives:** Our aim is to highlight a rare case of a transtibial amputee with lateral patellar instability who underwent MPFL reconstruction, arthroscopic debridement and synovectomy.

**Methods:** This case is presented with appropriate history, physical examination and imaging results. Literature about MPFL reconstruction in transtibial amputees was reviewed.

**Results:** We report a case of a 31-year-old female with a 20-year history of progressive right knee instability. She was born with a congenital limb deficiency due to amniotic band syndrome and underwent a transtibial amputation at the age of seven. MPFL reconstruction was performed using a semitendinosus tendon autograft harvested from the contralateral knee. Post-operatively there were no symptoms of instability or recurrence of dislocation. The patient has been ambulant using her prosthesis without any pain or restrictions. On subsequent follow up to 2 years, the patient was ambulatory with prosthesis without any pain and episodes of instability.

**Conclusion:** This case showed good results of the operative treatment option used such as MPFL reconstruction. This procedure reduces pressure on the patellar tendon and redistribution of proximal forces away from the patella. No complications were noted post operatively such as instability and stiffness. Patient was able to maximize functional mobility which ultimately leading to a better quality of life.

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### **Adhesive Capsulitis Secondary To COVID-19 Vaccination**

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**Introduction:** Shoulder injury related to vaccine administration (SIRVA) is thought to arise from improper administration of intramuscular vaccines to the deltoid muscle. This can manifest as several shoulder pathologies including adhesive capsulitis.

There is limited literature on SIRVA related adhesive capsulitis occurring after receiving COVID-19 vaccination. Our objective is to investigate the clinical presentation, treatment and outcomes of adhesive capsulitis secondary to COVID-19 vaccination.

**Materials and Methods:** This is a case series of 7 patients presenting with adhesive capsulitis to our specialist outpatient clinic within 4 weeks of administration of COVID-19 vaccine to the affected arm between March 2021 to December 2021.

**Results:** Of the 7 cases identified, 6 were female (85.7%) and 1 was male with an average age of 60 years. They received either the Moderna mRNA-1273 (57.1%) or Pfizer-BioNTech BNT162b2 vaccine and presented on an average of 14 days after vaccination. The average Visual Analogue Scale (VAS) was 8.1 and the mean range of motion (ROM) include forward flexion of 104.3° and external rotation of 32.3°. All patients underwent physiotherapy for an average duration of 4.7 weeks while 5 patients (71%) underwent hydrodilatation of the shoulder joint. The mean post treatment VAS score was 3.3 while mean ROM was forward flexion of 140° and external rotation of 48.6°.

**Discussion & Conclusion:** With the global push for vaccinations against COVID 19, physicians and patients should be aware of SIRVA related adhesive capsulitis. We demonstrate that it is highly treatable with non-surgical methods. Improvement in pain, ROM and function can be expected, especially for patients who underwent physiotherapy and hydrodilatation.

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### **A Novel And Synergistic Combination Skin Adhesive Tape - Incisional Negative Pressure Wound Therapy Technique For Postoperative, Poorly Healing And Gaping Spinal Wound Dehiscence**

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**Introduction:** Postoperative wound dehiscence is a compelling concern, having demonstrated significant impact on patients' mortality and morbidity. Treatment is multifaceted, involving reversing medical causes and meticulous wound care. Presently there are no guidelines on the treatment of wound dehiscence due to its huge variability and complexity. The authors report the successful application of a novel, combination Skin Adhesive Tape - Incisional Negative Pressure Wound Therapy (SAT-INPWT) used to treat a postoperative, poorly healing and gaping spinal wound dehiscence effectively.

**Materials and Method:** A combination of SAT-INPWT was applied onto a midline thoracic wound of a 44-year-old patient with diabetes who underwent T9 to T11 decompression laminectomy and flavectomy, had wound dehiscence on post-operative day 14, which demonstrated poor healing despite 29 days of hydrocolloid dressing. 6 x 100 mm SATs were placed perpendicularly to the wound to tension it partially closed, after which INPWT was applied over the SATs. It was removed after four and seven days for wound inspection. The appearance of the wound was compared with that of the wound after four and seven days of this novel therapy.

**Results:** The initial wound appearance was noted and photographically documented. There was notable increase in areas of wound epithelization, with reduced depth of dehiscence, four days after application of SAT-INPWT. There was near-complete closure and epithelization by seven days. The patient tolerated this therapy with no discomfort or complications.

**Conclusion:** The novel combination SAT-INPWT technique is a safe and effective method to improve wound healing in postoperative, poorly healing and gaping spinal wound dehiscence. This is due to the synergistic effects of the mechanical skin support and the negative pressure to collapse the wound bed at deeper levels.

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### **Tale Of An Extruded Talus – Reinsertion, Fixation And Coverage**

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**Introduction:** We present a case report on the management of a fractured extruded talus in a young polytrauma patient. A young male motorcyclist was involved in a road traffic accident. Amongst his other concomitant orthopaedic injuries (bilateral clavicular shaft fracture, left knee degloved wound, left scapula body fracture, right acetabular fracture), he also suffered an open fracture dislocation of his left talus, with its posterior talar body completely extruded and found in the road.

**Case report:** The focus of this case report will be on the management of an open fracture dislocation of the talus with an extruded body of talus. He was initially managed according to ATLS (Advanced Trauma Life Support) principles in the emergency department (ED) and the contaminated talus was preliminarily washed with normal saline. He underwent wound debridement, reinsertion, and provisional pinning of the talus, along with a spanning ankle external fixation after meticulous cleansing of the extruded talus with normal saline and antibiotic solution. He then had definitive fixation of his fracture talus with 2 headless compression screws 5 days post injury, and a free flap procedure after for the soft tissue defect. He was followed up in the outpatient clinic. At 5 months, there were no signs of infection, and the patient was tolerating weight bearing well with reasonable functional range of motion of his ankle.

**Conclusion:** An extruded talus is an uncommon but devastating injury that is fraught with potential complications (infection, subsequent avascular necrosis of the talus). It is one of the rare occasions where a contaminated and likely devitalized bone is

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### **Treatment Of Reverse Oblique Trochanteric Femoral Fractures With Proximal Intramedullary Femoral Nail And Plate**

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**Introduction:** The incidence of proximal femoral fractures has increased with a greater number of patients who are in the elderly population with osteoporosis. Reverse oblique fractures is a unique fracture pattern that is anatomically and mechanically different from the other trochanteric fractures. The fracture line extends from the proximal medial cortex out through the distal lateral cortex. Thus it is more difficult to treat due to medial displacement of femoral shaft. Reverse oblique fractures have two main types of implants available, which are the dynamic hip screw (DHS) and intramedullary implants. However, there is a high rate of incidence of fixation failures when the dynamic hip screw are used, due to the anatomical structure of the reverse oblique fracture which would result in a varus deformity of the fracture during the recovery phase. Additionally, the clinical reports regarding intramedullary implants for reverse oblique fractures are few in numbers.

**Materials and Methods:** The surgery involves a stainless steel intramedullary nail, 2.7mm mini plate with 3 screws, traction table and isolation drape. Gentle traction is applied to reduce the fracture in abduction and an open incision is created at the fracture site. The fracture is reduced under direct supervision. The 2.7mm mini plate with 3 screws is applied and fixed at the antero-lateral surface of the femur. The hip is adducted to allow the ease of access of Kirschner wires at the greater trochanter to guide the placement of the intramedullary nailing. Short proximal femoral nailing is performed.

**Result / Discussion:** Dynamic Hip Screw can be used to fix reverse oblique fractures, however, it results in extensive medialization of the shaft and poor fracture healing, resulting in higher risk of implant failure. Hence, femoral nailing is the next best alternative. However, there has also been higher failure rate in femoral fixation due to an estimated 10% chance of cut out. As a result, with the implementation of mini plates and 3 nails at the anterolateral surface of the femur, it counters the varus movement of the muscle which increases the rate of recovery and ensures that there is good periprosthetic alignment. All 3 patients from the case series have good indications and prognosis of healing at the 6 to 9 month mark.

**Conclusion:** The method mentioned above to treat reverse oblique fractures have shown good prognosis in patients. However, this is a case series and a larger study is required to determined the quality of reduction and fixation using intermedullary nailing and mini plates.

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### **Case Report Of A Charcot Foot Reconstruction On A Subtotal Calcaneotomy**

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**Background:** As the prevalence of diabetes has been on the rise around the world, there is increased awareness and interest of diabetic related Charcot foot arthropathy. The management of patient with a combination of Charcot foot arthropathy with a calcaneum osteomyelitis is a great challenge to treating clinicians.

**Case Presentation:** In this case report, a 64-year-old Indian, gentleman with diabetes and left Charcot foot presented to us with a chronic ulcer and osteomyelitis of the left calcaneum. He had multiple wound debridement and subsequently had anterolateral thigh flap coverage done for the left heel wound. 3 months later, a tracking sinus deep to the heel wound formed. He had a partial calcaneotomy up to the achilles tendon insertion and underwent multiple debridements with negative pressure dressings for his wound. His wound progressively healed slowly, and he was on regular follow up under the care of a multidisciplinary team comprising of orthopaedics, plastic surgery, endocrinologist and podiatrist. His wound never fully healed and 20 months later, presented with a recurring heel abscess. He had a subtotal calcaneotomy for the calcaneal osteomyelitis and circular frame application to off load the heel and help in the wound healing. His wound improved with supervised wound care and circular frame was removed 2 months later. He was able to ambulate with a splint. He presented 3 months later with plantar ulcer due to mid foot collapse due to charcot foot arthropathy. Further debridements was done and subsequently decided for a Charcot foot reconstruction with beam screws and circular frame application. He was allowed to weight bear with the ring fixator. The frame was removed at 2 months. At 6 months follow up all his wounds healed and Radiographs showed good consolidation of his charcot foot reconstruction and he is able to ambulate pain free with walker boot.

**Conclusion:** This is the first case report of a Charcot foot reconstruction with subtotal calcaneotomy. The goal of the surgery was to produce an ulceration-free plantigrade foot. Surgical planning and pre-operative work-up with a multidisciplinary team, are crucial to minimise postoperative complications.

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### **Indications And Outcome Of Minimally Invasive Tripod Screw Fixation For Peri-acetabular Metastatic Bone Lesion – review Of Tripod Fixation Technique And Our Experience**

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**Introduction:** The pelvis is a common site of metastatic bone disease. Peri-acetabular lesions are particularly challenging as they can cause pain, disability and pathological fracture. Treatment of these have traditionally been focal palliative radiotherapy and protected weight bearing or major surgical procedures like modified Harrington reconstruction which are associated with

significant surgical morbidity. Such procedures can affect remaining quality of life for many these patients. Percutaneous techniques have been developed to minimize surgical morbidity. One such technique is peri-acetabular percutaneous screw fixation which though previously used in acetabular fractures are now becoming increasingly popular in metastatic lesions as tripod fixation.

**Aim and Objectives:** To assess the feasibility, indication, technical feasibility and outcome of tripod screw fixation of peri-acetabular metastatic bone lesion.

**Materials and Methods:** Patients with metastatic cancer and or multiple myeloma who have shown good response to primary treatment and good pre-morbid functional status were selected. They underwent the newly described tripod fixation of peri-acetabular lytic metastatic lesion with percutaneous screw fixation using intraoperative fluoroscopy.

**Results:** We used this technique in two such patients. One with metastatic cholangiocarcinoma and other with multiple myeloma. Both presented with pain on ambulation. Advance imaging confirmed neither had complete fracture and had clinically responded well to treatment of primary disease previously with expected prognosis of more than 6 months. Radioluscent operating table with fluoroscopy guidance was used, with no use of complex technology like navigation or intraoperative CT. The operative setup, positioning of C-arm image intensifier by the radiographers was easy to follow with combination of pelvis AP, inlet-outlet, Judet views or combination of such. Placement of posterior column and supra-acetabular screws is quick and simple, however anterior column screw requires practice and some tricks with rail-road techniques to navigate the instrumentation. Bone quality despite the lesions was fair with reasonable purchase of screw threads. Surgical time was less than 100 minutes with minimal associated blood loss. This technique led to excellent outcomes regarding both pain control and functionality.

**Conclusion:** Younger patients with good pre-morbid functional status and reasonable prognosis can benefit from this percutaneous procedures. Physicians must take into account the patients' overall health status, oncologic prognosis and anatomic location and extent of disease when developing an appropriate surgical plan. The procedure is performed in a standard operative theatre using fluoroscopic guided percutaneous screws. Despite the simplicity of intraoperative set-up and instrumentation, it can be technically demanding. The outcome of pain control and allowing weight bearing early is predictable while late outcome of preventing major reconstruction procedure versus a simpler primary total hip replacement is yet to be assessed.

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### **Does Accuracy Of Oxford Unicompartmental Knee Arthroplasty Influence Clinical Outcomes?**

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**Introduction/Objectives:** Unicompartment knee arthroplasty (UKA) with the Oxford Partial Knee system is a well-established treatment option for anteromedial knee osteoarthritis with excellent long-term clinical outcomes. Several studies have demonstrated an increased survivorship of UKA with the accuracy of implantation. There is currently limited data with regards to the accuracy of implantation and clinical outcomes. The aim of this study was to investigate if component positioning has an influence on patient reported outcome measures.

**Material and Methods:** This was a retrospective cohort study of prospectively collected data utilising an arthroplasty registry. Between September 2017 to December 2020, a total of 105 knees who underwent primary Oxford Partial Knee (phase III) were included. Patient reported outcome measures were determined with the Oxford knee score (OKS), American Knee Society (AKS) Functional Score, AKS Clinical Score, and Visual analogue scale (VAS). The position of the implant components was assessed with coronal and sagittal post-operative radiographs of the knee based on the prescribed radiographic parameters recommended by the manufacturer. The accuracy of component position and clinical outcomes scores were compared. Statistical analysis was performed with Fischer's exact test and independent samples t-test for categorical and continuous variables respectively. A pre-determined p-value <0.05 was defined as the threshold for statistical significance for each analysis.

**Result/Discussion:** There were significant improvements in all patient reported outcome measures – OKS, AKS functional score, AKS clinical score, and VAS (all values p<0.001), at the 3-months, 12-months, and 24-months follow-up intervals. Based on the manufacturer recommendations, the femoral and tibial components were found to be in an optimal implanted position in 46.4% and 28.8% of knees respectively. Although there was a general trend of higher patient reported outcomes when components were within optimal limits, the difference did not reach statistical significance. With regards to the individual radiological parameters, there was a significant decrease in the AKS clinical score at the 12-month mark when the tibial slope was found to be outside recommended position (p=0.042). One patient required a re-operation for progression of arthritis of the lateral compartment, while 1 patient had a peri-prosthetic tibial fracture that was treated with immobilisation.

**Conclusion:** The Oxford Partial Knee Microplasty instrumentation achieved significant improvement in patient reported outcomes measures. The mobile bearing UKA appears to allow for a margin of implant positioning error without compromising short-term clinical outcomes. Further studies with larger cohort and longer follow-up durations are warranted to investigate the long-term clinical implications of component positioning.

### **Identification Of The Superficial Peroneal Nerve: Is The Fourth Toe Flexion Sign Useful In Our Local Population?**

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**Objective:** Iatrogenic injury to the superficial peroneal nerve can occur during surgery to the foot or ankle. The purpose of the study was to evaluate the prevalence of the superficial peroneal nerve clinically when using the fourth toe flexion sign in our local population.

**Methodology:** Between August to November 2020, all new patients between 21-70 years of age who attended our foot and ankle specialist clinic were invited to participate in the study. Participation was voluntary and individuals with a history of surgery to the foot were excluded from the study. Volunteers were provided with a patient information leaflet and were required to complete an anonymous questionnaire with details of their age, sex, weight, height, race, shoe size and weekly sports participation. Their feet were then examined by a consultant foot and ankle surgeon to record the presence of the superficial peroneal nerve. The superficial peroneal nerve can be identified by flexing the fourth toe with the ankle in plantarflexion and inversion. This was recorded as either visible, not visible but palpable or absent.

**Results:** A total of 154 volunteers were recruited for the study (male=93, female=61). The superficial peroneal nerve was visible in 35% (n=54). In those patients where the nerve was not visible, another 14 patients had the nerve identified by means of palpation. In total, the nerve was identifiable 44% of the time on clinical examination. BMI (p=0.01) and sports participation (p=0.011) were significant determinants of whether the nerve was clinically identifiable. Age, sex, shoe size and race did not differ between the groups where the SPN was identifiable clinically.

**Conclusion:** The fourth toe flexion sign is a useful clinical sign to identify the superficial peroneal nerve when planning incisions over the foot or ankle during surgery to reduce the chance of iatrogenic injury. This sign can aid in identifying the nerve in 44% of our local population. A lower body mass index (BMI) and participation in sports were factors associated with positive identification of the nerve.

printed scaffolds can meet the complex needs of bone defect repair and support the personalized treatment of patients (3).

**Conclusion:** Fractures of the medial condyle of the femur may be prone to developing avascular necrosis. In cases where a huge bone defect is encountered, allograft should be considered in young active patients as it provides early weight bearing and satisfactory knee movement. The future of bone defect reconstruction might be 3D printing.

### **Femoral And Tibial Phenotypes Of Varus Alignment In A South-east Asian Arthritic Population: A Descriptive Study**

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**Introduction:** Knee joint reconstruction and joint preservation has become increasingly common procedures in treating varus osteoarthritis. Knowledge of femoral and tibial morphology is important for patient-specific surgery in both joint reconstruction and preservation procedures. While there have been recent studies evaluating morphological variance in femoral and tibial phenotypes in Western populations, there is considerably less information on Asian populations. This study aims to evaluate the femoral and tibial phenotypes of varus alignment in a South-east Asian population.

**Method:** Long-leg coronal standing radiographs of patients aged 18 years and above from the hospital repository were evaluated. Patients with varus coronal alignment and a hip-knee-ankle (HKA) angle of less than 177° were selected. Mechanical lateral distal femoral angle (mLDFA), medial proximal tibial angle (MPTA) and joint line convergence angle (JLCA) were measured for all radiographs. Basic demographic information such as age, gender, ethnicity and body mass index were also recorded. A descriptive analysis was performed on alignment parameters and demographic data were assessed for correlation.

**Results:** There were 1207 varus osteoarthritic knees. The mean age was 64.14 ± 9.39 years, mean body mass index (BMI) was 27.95 ± 5.34 kg/m<sup>2</sup>. 65.12% of the population was female. 78.79% of the population was Chinese, 10.27% Malay and 8.53% Indian. The mean MPTA was 85.17 ± 2.95°, mean mLDFA was 89.01 ± 2.77°, and mean JLCA was 5.49 ± 3.51°. In 2.07% (n = 25) of the knees, varus deformity was found solely in the femur. In 68.60% (n = 828) of the knees, varus deformity was found solely in the tibia. In 4.97% (n = 60) of the knees, varus deformity was contributed by both the femur and the tibia. In assessing the correlation between demographic and alignment parameters, BMI was found to be a strong determinant for both femoral varus (p = 0.004) and joint line incongruence (p < 0.001).

**Conclusion:** To our knowledge, this is the first descriptive study evaluating femoral and tibial morphology of varus osteoarthritic knees in a multi-ethnic South-east Asian population. Tibial varus was the largest contributor of varus malalignment, with the largest proportion being in apex distal (CPAK I). The information gained from this study will be important for surgeons to consider when planning for joint preservation procedures such as corrective osteotomies as well as for joint arthroplasties to restore alignment.

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### **Good Survivorship Of Small Femoral Corail® Stems In Asian Population Using Direct Anterior Approach**

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**Introduction:** Corail® Femoral stems is commonly used cementless total hip arthroplasties with good long-term patient outcomes. Multiple studies from data derived from Caucasian Joint Registries found higher rates of revision in smaller femoral stem sizes compared with the larger sizes, commonly due to loosening. We hypothesise that stem survivorship and complication rates are similar in smaller size Corail stems in Asian population due to our smaller stature and smaller femoral canal diameter.

**Method:** Single-surgeon, single centre retrospective cohort study of Asian patients with primary total hip arthroplasty (THA) via the direct anterior approach using Corail® cementless stems (n=164). Propensity matching was performed for body mass index, age, gender, Dorr's classification. Complications, rate of revision and patient-reported outcomes were compared between the small-stem group (size 8 to 10; n= 94) and large-stem group (size 11 and above; n= 70).

**Results:** Mean follow-up was 4.5 years, interquartile range 3.5 to 5.35 years. No difference in stem-related complication rates (hazards ratio 1.49; p = 0.482) was found in between the small (3 intra-operative calcar fractures, 1 peri-prosthetic fracture) and large stem groups (1 stem malposition and 1 peri-prosthetic fracture). 2 acetabular revisions were reported in small stem groups and 2 femoral revisions were reported in the large stem groups. No stem loosening was measured in either groups, and there is 1 case of stem subsidence was reported in the small stem group, which was associated with conservative management of peri-prosthetic fracture. Age and BMI are noted to be independent predictors of complications, whereas no difference in complications are calculated between the Dorr types.

**Conclusion:** Our study is the first in Asian population, demonstrating comparable survivorship between small and larger size cementless femoral stems Corail® in primary THAs. This is perhaps due to the innate differences in proximal femoral metaphyseal dimensions found in Asians with wider proximal medial-lateral width, allowing increased bone-implant contact to improve bony ingrowth and reduce the incidence of undersizing. Adequate distal reaming, use of fluoroscopy during the direct anterior approach will assist the surgeon in appropriately sizing and positioning the implant to enhance survivorship.

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### **Deeper flexion and Male gender predict ability to Squat and/or kneel after knee replacement. A study amongst South-East Asian population**

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**Background:** Squatting and kneeling are activities that play a significant role in our daily activities, especially so in many Asian cultures. Western data has shown that the ability to do so after knee arthroplasty has traditionally been low, citing that patients did not require squatting and kneeling to perform most of their daily activities. However, in many Asian cultures, these actions are needed for essential activities such as religious prayers and having a meal.

**Objectives:** This study aims to evaluate if patients are able to squat and kneel 1 year after knee arthroplasty procedures and to identify factors that predict them

**Study Design & Methods:** A total for 852 knees from 791 patients (252 males, 539 females, Age 44-89) who have completed 1-year follow-up were identified from an institution knee registry database. Oxford Knee Score (OKS) and Knee Society Scores (KSS) and the ability to squat and/or kneel were collected as part of the database functional outcomes assessments.

**Results:** Of the 852 knees recruited, 342 (40.14%) had the ability to squat 1-year post knee arthroplasty surgery while 294 (34.51%) patient were able to kneel. 246 (28.88%) of the 852 knees were able to achieve both squatting and kneeling at 1-year post-surgery. We analyzed each of these sub-groups independently based on the objective and clinical scores mentioned above. Further analysis showed that male gender and patients' maximum degree of knee flexion were two significant (p<0.05) factors that correlated with the patient's ability to squat and/or kneel post-operatively. Patients' inability to squat and/or kneel pre-operatively was also a significant negative predictor of their ability to do so after surgery. Functional outcome scores (OKS and KSS) were higher in each sub-group of patients as compared to those who were unable squat and/or kneel. This also translated into higher patient satisfaction.

**Conclusion:** This study reinforced the fact that kneeling and squatting can be achieved after knee arthroplasty surgery. We also managed to identify that gender and post-operative range of motion are key factors that influenced patient's ability to squat and kneel post-operatively. Having the ability to squat and/or kneel also translated into better functional outcomes for patients. This valuable information can help serve as a guide when counselling patients pre-operatively and manage their expectations on post-operative functional outcomes.

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### **Gout Mimicking Soft Tissue Sarcoma Of The Foot**

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**Introduction:** Gout is a form of purine metabolism disorder associated with deposition of monosodium urate crystals. Chronic gout may cause deposits of hard lumps of uric acid around joints and may be indistinguishable from soft tissue sarcomas.<sup>1</sup>

**Report:** A 33-years-old gentleman presented with 1 week history of pain and swelling over right foot. The swelling had started insidiously 1 year ago. It rapidly increased in size and pain progressively worsened over the past month. There was no history of preceding trauma, red flag signs or history suggesting previous acute gouty arthritic episodes. Physical examination reveal a 10x8cm firm circumferential swelling of the 1<sup>st</sup> metatarsophalangeal joint. It had ill-defined margins, warm, tender to touch with hemerosous discharge present from the mass. WCC:10.4x10<sup>5</sup>, ESR:46 mm/hr, CRP:47.5mg/L, Uric Acid:585umol/L. Xray showed a bony expansile lesion of the first metatarsophalangeal joint. MRI showed an ill-defined heterogenous soft tissue mass at the 1<sup>st</sup> metatarsophalangeal joint with bony destruction. Discharge material from the wound was sent for microscopic analysis which showed negative birefringent crystals. A wide excision involving a disarticulation of tarsometatarsal joint of right big toe was performed. HPE analysis reported as granulation tissue with presence of gouty tophi. In cases where there is doubt between gout/soft tissue sarcoma, one must return to the basics of a detailed history, physical examination, and investigations to assist in diagnosis. The microscopy analysis played a significant role in the diagnosis of this patient.<sup>2</sup>

**Conclusion:** This case represents a variable presentation of chronic gout. The diagnosis may sometimes not be clear cut a high index of suspicion must be maintained.

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### **Peri-operative Analgesia For Total Knee Replacements: A Direct Comparison Of Local Infiltration Analgesia (Pure Ropivacaine vs Cocktail)**

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**Background:** Total knee replacements (TKRs) aim for early return to function mainly limited by pain. Peri-operative analgesia includes local-infiltration-analgesia (LIA). Our centre uses LIA cocktail of Ketorolac, Adrenaline and Ropivacaine as part of Enhanced Recovery (ERAS). This is individually drawn, combined, and diluted; taking additional steps/time. Pre-diluted Ropivacaine pack removes these steps. This study compares if pre-diluted Ropivacaine LIA with intra-operative IV Parecoxib has comparable effects to the current LIA cocktail.

**Methods:** Prospective propensity matched cohort trial of primary TKRs in a tertiary centre. Patients with inflammatory arthritis and contraindication to NSAIDs were excluded. LIA was given at same stages of surgery and weight adjusted. Patients were given either the full cocktail or LIA ropivacaine with IV Parecoxib. VAS scores were collected from post-operative Physiotherapy assessments on day 0/1.

**Results and Discussion:** Patients had an average length-of-stay of 1.89 days. A total of 37 patients (19 cocktail and 18 pure Ropivacaine) with an average age of 68.2 years. The mean VAS for cocktail was 2.32±0.930 compared to 4.44±0.940 for pure Ropivacaine and significantly different (p=0.007).

**Conclusion:** Use of a sterile pre-diluted pack of Ropivacaine during TKR while administering NSAIDs intravenously anecdotally reduced the need for manpower/time to prepare the cocktail. Even though all patients were discharged home, conventional cocktail had significantly better pain scores immediately post-op. The focus on patient satisfaction immediate post-op tended toward using conventional cocktail. Peri-operative analgesia for TKR continues to balance between efficiency vs efficacy. It would be prudent to explore whether this would affect patient outcomes beyond immediate post-op.

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### **Fusion Rates In Lateral Access Spine Surgery: A CT Analysis On The Oblique Lumbar Interbody Approach**

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**Background:** Oblique Lumbar Interbody Fusion (OLIF) is a minimally-invasive approach that utilizes a uniquely oblique surgical corridor which minimizes risk of neurological and psoas-related symptoms. OLIF has been described as a promising approach to minimally invasive lumbar interbody fusion surgery. Lumbar fusion hinges on patient, technical and implant-related factors. Pseudarthrosis can lead to persistent symptoms, instrumentation failure, and revision surgery. However, reported fusion rates in OLIF vary widely in literature. The objective of this study is to determine objectively the rate of radiologic union in patients who underwent OLIF and identify risk factors that can lead to pseudoarthrosis.

**Methodology:** A retrospective review of patients who underwent OLIF from L1 to L5 in a tertiary centre by a single surgeon with a minimum of 12-months follow-up. These patients underwent OLIF for lumbar degenerative disease / spinal stenosis / spondylolisthesis. Trauma, infection, malignancy, and previous interbody fusion at the same level were excluded. The Bridwell Fusion Criteria was used on computed tomography (CT) scans done post operatively. Cage subsidence was assessed (Marchi Classification). Patient biodata such as age, gender, body-mass index (BMI), smoking, and diabetes mellitus (DM) was collected. Radiographic data was analysed by 3 independent observers not involved in the surgery, blinded to each other's analysis, and underwent standardization and calibration beforehand.

**Results and Discussion:** 56 patients were included in this study with a total of 106 levels. There were 17 males (30.4%) and 39 females (69.6%) and their mean age was  $67.4 \pm 7.74$  years old. The mean BMI was  $26.0 \pm 4.78$ . More than 94% of patients had at least a partial if not complete fusion with the earliest CT scan done at 6-months. A subgroup analysis revealed that all patients above the 12-months period had 100% fusion rates. There were 0 reoperations.

There were no strong correlations found between fusion rates and patient or surgical related factors. One of the larger correlations seen was age where older patients tended toward having signs of less radiological fusion (0.173,  $r^2 = 0.0299$ ).

**Conclusion:** This study allowed for the exclusion of inter-surgeon variability, and controlled for differing hospital practices. There was a high percentage of fusion (>94%) and no reoperations. There was no significant correlation amongst the parameters collected in relation to fusion, highlighting how OLIF is able to overcome certain risks factors for non-union. This could have been skewed by the high rates of fusion. Age demonstrated a tendency to decrease fusion rates in the older age group but was not strongly correlated. OLIF is a promising minimally invasive approach for lumbar interbody fusion.

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### **Evaluating The True Cost Of A Proximal Humerus Fracture: The Importance Of Indirect Cost And Productivity Loss**

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**Introduction:** Rising healthcare costs remain a big concern for patients, healthcare administrators and national policy makers. It is important to be able to analyse the cost impact a condition has to allow for prudent resource allocation while providing evidence-based healthcare. This cost analysis should include both direct and indirect costs for better quantitative understanding of the condition. Proximal humerus fractures are the third most common fracture in the elderly population. Whilst its management for surgical vs conservative remains controversial, we wanted to analyse the productivity impact the condition poses on the population affected by this fracture and the total costs (direct and indirect) over a 6-months period.

**Methods:** This was a prospective cohort study between July 2017 and March 2020 who had isolated proximal humerus fractures either operated or managed conservatively (n = 219). The patients were followed-up over a 6-months period and data was collected for direct and indirect costs based on hospital records and using the Work-Productivity-and-Activity-Impairment (WPAI) questionnaire. The questionnaire was administered at the 6 weeks, 3 months, 4.5 months and 6 months.

**Results and Discussion:** Direct costs between unemployed and employed patients had no significant difference. However, indirect costs remained significantly higher in the employed group throughout the entire follow up ( $p < 0.001$  across all time points). While direct costs declined over time (\$4046.63 to \$192.37), indirect costs remained high and contributed to a larger proportion of the overall costs over the follow-up ranging from (50.3% to 93.5% of total costs). Absenteeism costs show a steep decline between 6 weeks and 3 months (\$7940.55 to \$3523.39) and continue to decline over time. Presenteeism costs were overall lower but remained persistent over time. Presenteeism costs even surpassed absenteeism costs past the 4.5 months follow-up (\$1500.35 vs \$1361.17).

**Conclusion:** This study found that indirect costs play a significant part of the total costs for proximal humerus fractures. Defining only direct costs for such conditions will result in an incomplete picture of the cost impact and productivity loss. Productivity loss can be quantified objectively through the WPAI method and has shown that losses still incur even after the patient has gone back to work (i.e. presenteeism). Our study therefore highlights that on top of the obvious direct costs, patients are also significantly affected by indirect costs and productivity loss. It is therefore imperative to consider quicker return to work and better return to work programs to reduce the amount of productivity losses.

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### **Return To Driving Is Safe 6 Weeks After Anterior Cervical Surgery For Symptomatic Cervical Degenerative Disc Disease**

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**Introduction:** Returning to driving after cervical spine surgery remains a controversial topic with no clear consensus on how to best assess a patient's fitness to drive. This study aims to determine the timing and clinical parameters for safe return to driving via a real-world driving assessment.

**Materials and Methods:** Patients above the age of 18 years who underwent anterior cervical spine surgery for symptomatic cervical degenerative disc disease (SCDDD) and possessed a valid motorcar driving license were recruited. Data on Neck Disability Index (NDI), modified Japanese Orthopaedic Association (mJOA) scores, visual-analogue-scale (VAS) score, range of motion and functional strength of the cervical spine was collected pre-operatively and at 2-, 4-, 6- and 12-weeks post-surgery. Patients who met the minimum criteria; mild to moderate disability as assessed by NDI, VAS less than 5 within functional range of motion and adequate analgesic relief without opioids, were then referred for a standard functional driving assessment protocol to determine the fitness-to-drive. This comprised clinic-based off-road screening tests before an on-road driving test in live traffic conditions.

**Results:** 64 patients underwent anterior cervical surgery within the period. A total of 21 patients were recruited after meeting inclusion criteria. The mean age was 56.6 ( $\pm 8.9$ ) years. 17 patients (81%) passed the on-road driving assessment at 6 weeks. Patients who passed the driving assessment had lower mean NDI scores,  $3.4 \pm 3.1$  vs  $10.8 \pm 8.0$  ( $p=0.006$ ), higher mean mJOA scores  $16.1 \pm 0.6$  vs  $15.0 \pm 1.8$  ( $p=0.045$ ) and lower mean VAS scores  $2.4 \pm 1.5$  vs  $2.5 \pm 1.9$  ( $p=0.865$ ). Patients who passed the driving assessment also had higher functional cervical flexor strength,  $21.1s \pm 5.8s$  vs  $13.0s \pm 10.2s$  ( $p=0.042$ ) in a supine position. While range of motion (ROM) of the cervical spine was reduced in the immediate post-op phase, there was statistically significant improvement at the 6-week mark ( $p=0.001$ ) and the ROM of the spine in all directions was not correlated with ability to pass the driving assessment.

**Conclusion:** Most patients undergoing anterior cervical surgery for SCDDD demonstrate the ability to pass a standardized driving assessment and are safe to return to driving 6 weeks after surgery. Driving ability appears to be correlated with NDI scores  $\leq 3$  ( $p=0.006$ ), mJOA scores  $\geq 16$  ( $p=0.045$ ) and cervical flexion endurance of  $\geq 21s$  ( $p=0.042$ ). Cervical range of motion and VAS ( $p=0.865$ ) does not appear to be correlated with driving ability.

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