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Knee

X-ref ***For other Roundups in this issue that cross-reference with Knee see: Trauma Roundup 2; Oncology Roundup 8; Research Roundups 2, 3, 4, 6 and 7.***

The rising burden of knee arthroplasty

The increasing burden of osteoarthritis in an ageing population is well known, and despite a plethora of doom-mongering predictive papers a few years ago, there has been little in the recent literature to confirm if the rising tide is indeed, as they claim, rising! An epidemiology team in **Melbourne (Australia)**[1] have published one of the first studies to accurately quantify this increase. The major strength of this paper is in quite how comprehensive the dataset is, the investigators having reviewed data from Australia, Demark, Finland, Norway and Sweden. They used the long-standing and established population registries in these countries to compare the lifetime risk of primary total knee arthroplasty (TKA) for osteoarthritis (OA) in five countries, and to describe a change in lifetime risk over a ten-year period. The incidence of TKAs performed annually in patients aged 60 years or younger increased over the study period in all countries by up to 5.1%. The proportion of TKAs performed for those patients aged 80 years or older decreased over the ten-year period in all countries except Finland. TKA was most frequently performed for the 60 to 69 years age group at the end of the study period in 2013. The lifetime risk varied across all countries included in the study from 5.84% (Denmark) to 19.2% (Finland). The considerable data presented in this paper comprehensively assess the increasing burden of TKA in a range of developed countries, providing an important and sanitising review for all those responsible for planning healthcare budgets. In the face of tightening financial controls, decisions have to be made about this increasing demand. Difficult decisions are clearly looming and these will need to be made at national or healthcare funder level – in the majority of countries it seems likely that this increase in demand is unaffordable.

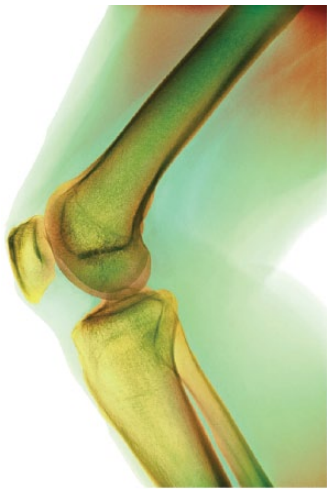
HIV in knee replacement

Early diagnosis and treatment of HIV has resulted in life expectancies approaching those of the general population. Such patients are just as susceptible to degenerative joint diseases as those without HIV, in addition to the excess risk of osteonecrosis. Concerns have previously been raised about the higher risk of peri-operative complications such as myocardial infarction, acute renal failure, wound infection and lower implant survivorship in the HIV population, however, there is little data to support this supposition. With considerable disagreement in the current literature, the authors of this study aim to review clinical outcomes in patients with HIV undergoing total knee arthroplasty (TKA), implant survivorship and complications. Despite this increasing disease burden, there are few studies on which to form an evidence base. We were delighted to see this retrospective review from **South Orange, New Jersey (USA)**[2] of 45 patients, all with HIV, reporting the outcomes of 50 TKAs. The paper reports the outcomes to a mean follow-up of six years (4 to 10) with a comparison-matched cohort of 135 patients without HIV. These also underwent a TKA performed by the same surgeons. Importantly, patients with HIV who also had haemophilia were excluded from this study. There were no differences in clinical outcomes at the final follow-up between the two groups, and no differences in survivorship. There was a single revision in the HIV group at two years for pain and instability and a single case of aseptic loosening in the matched cohort at three years. There were no revisions for infection in either group and post-operative complications were also comparable in both groups. With the improved medical management of HIV and better survival rates, it is increasingly likely that these patients will present with end-stage degenerative joint disease, requiring total joint arthroplasty. Despite its weaknesses, this is the largest comparative study to date reviewing this patient population, for which the authors should be commended. The message from this study is clear: as with any comorbidity, pre-operative optimisation is vital to a successful outcome. Close liaison with the medical team pre-operatively is essential when contemplating performing a TKA in a patient with HIV. Do check with your medical colleagues that they are happy to provide support peri-operatively. However, when appropriately performed in a multidisciplinary setting, the results are comparable with those of HIV-negative patients.

Frame-assisted fusion: the ultimate bailout?

The almost universal success of large joint arthroplasty makes the failures somewhat harder to bear. However careful and competent the surgeon, patients will go on to develop deep infections, and on occasions these will not be treatable with the traditional washout or revision arthroplasty approach. When other options have failed, knee arthrodesis is often the 'go to' salvage procedure. It allows the surgeon to address patients with extensive bone loss and recurring knee infections without loss of the limb. The aim of such a procedure is to gain a stable, pain-free lower limb, and with obliteration of the joint there is a low risk of further infection - an attractive alternative to an above-knee amputation. Arthrodesis can be performed in a

number of ways, including internal osteosynthesis, intramedullary nailing and external fixation. There is little in the literature to aid one choice over another, however, frame-assisted fusion does offer the attractive option of fusion without metalwork immediately in the vicinity of the infected bed. These authors from **Milan (Italy)**[3] cast some light on the likely outcomes of frame-assisted fusion of the knee and report a total of 19 knees in 19 patients with a mean age of 75 years at around three years of follow-up. There were 14 patients who underwent fusion for septic loosening, three with extensor mechanism deficit and aseptic loosening, and two who had a fracture of a previous arthrodesis site. Following surgery, the authors achieved complete contact between the femur and tibia in full extension with 5° to 7° of valgus and 3° to 5° of tibial external rotation. The mean shortening was 4 cm (2 to 7) at the end of surgery. Complete fusion of the arthrodesis site was achieved in 15 patients (79%), with four cases (21%) of nonunion. The mean length of time spent with the frame was 11.7 months, with the infected patients requiring longer (12.4 months). The results reported in this study compare favourably with the results published for other surgical techniques, and the Ilizarov method is clearly able to provide enough mechanical stability to allow for bony union at the arthrodesis site. Additional advantages include the ability to increase the frame stiffness, alignment correction and correct limb-length discrepancy during the fusion period. This excellent study highlights an extremely successful surgical technique to achieve arthrodesis at the knee. Although ostensibly a 'mixed' series, the majority of patients have had an infected joint replacement requiring stabilisation. The advantage that an Ilizarov frame has in encouraging bony union at the arthrodesis site, as well as the ability to correct limb deformity and shortening, makes this a flexible technique.



Driving and total knee arthroplasty

Patients are keenly interested in their recovery after total knee arthroplasty (TKA), and often ask questions about activities of daily living, such as returning to driving. While this is not often assessed in most patient-reported outcomes, it is an important question to patients. Motor insurance companies are loathe to offer any advice and usually leave that advice to treating surgeons. The older literature suggests that patients should avoid driving for a period of around six to eight weeks, and many surgeons are concerned about the potential for wound breakdown, weak hamstrings and quadriceps function prior to this point. However, undaunted surgeons from **Egg Harbor Township, New Jersey (USA)**[4] undertook a fresh look at this long-standing question. They report the outcomes of 50 prospectively followed patients, all of whom underwent a right TKA. 47 patients completed the study and undertook objective evaluation of the braking reaction time at two, four and six weeks post-operatively. The surgical team compared this with the pre-operative measured braking times and established that 80% reach their baseline at two weeks and 100% by four weeks. Clearly, braking reaction time normalises for all patients to their pre-operative reaction time between the second and fourth post-operative week, and it would not seem unreasonable to allow patients to return to driving, depending on progress, at around this stage.

Weather and osteoarthritis symptoms X-ref

It is commonplace for patients in clinic, whatever their diagnosis, to complain of weather-related pain. Patients complain of symptoms as varied as pain when 'the wind chills' through to specific complaints of pain during cold or wet weather. Here at *360*, we have always taken these associations at face value as there was no evidence one way or the other. We were delighted to read this paper from **Sydney (Australia)**,[5] quantifying the association between the weather and exacerbation of knee arthritis. The study team undertook a web-based crossover study and examined knee osteoarthritis symptoms and their relationship to the weather collated in terms of maximum and minimum temperature (°C), relative humidity (%), barometric pressure (hPa) and precipitation (mm). Knee pain was collated on a numerical rating scale and the results of 345 participants (171 with a single episode of pain exacerbation) yielded 1425 observations. Perhaps surprisingly, given the frequency of the complaint in clinic, there did not appear to be any link between knee pain exacerbation and any of the meteorological factors measured. One could perhaps argue that compared with the rest of the world, the weather is never very bad in Australia!

Patient dissatisfaction and post-operative pain

Pain is not universally effectively treated following total knee arthroplasty (TKA) and there is a pool of patients who complain of persistent post-operative pain. This may or may not lead to dissatisfaction and this is an important study that aims to unpick the link between, and determinants of, dissatisfaction and pain following TKA. The team in **Bristol (UK)**[6] undertook a case-controlled analysis comparing patients with persistent pain and those without, using 2:1 matching for potential covariates of age, gender, time from surgery and prosthesis used. The variables assessed were biological, implant-related and psychosocial factors. This study established that dissatisfaction in those patients reporting post-operative pain following knee replacement was associated with a range of factors including instability, stiffness and lack of social support. Patients who had persistent pain but were not dissatisfied, were associated with patellofemoral problems, high BMI, low pain thresholds and these were associated with pain but not determinants of satisfaction.

Re-injury in patients with ACL reconstruction X-ref

As junior sport is becoming more and more competitive, and perhaps hand in hand with the increasing weight of the paediatric population, there is currently a rapid rise in paediatric anterior cruciate ligament (ACL) injury. Those series describing primary repair would suggest that patients do well with reconstruction, and that in the longer term there is little or no effect on knee growth from the reconstruction itself. However, it is well known that the re-injury rate is high in the younger population. Estimates in the published literature suggest re-injury rates of up to 40% which is colossal and calls into question the value of undertaking ACL reconstruction in this age group. The sports medicine group in **Melbourne (Australia)**[7] have been able to report the outcomes of 354 consecutive patients, all with ACL reconstructions undertaken in patients who were under 20 years of age. The authors subdivided these into patients below the age of 18 years and those in the 18 to 20 years age bracket. Follow-up was achieved to a mean of five years, with the chief outcome measure being further injury to the ACL. In their series, the ACL graft failure rate is reported at 28% in the under 18s within two years, with a further

18% also reporting contralateral ACL injuries within four years. This contrasts sharply with those over the age of 20 years (where a 14% re-injury rate is reported). It is clear that in this series at least, early reconstruction is a risk factor for secondary injury, although in clinical practice the importance of protecting the meniscus may outweigh concerns of higher ACL re-injury rates.

Acute kidney injury following arthroplasty X-ref

■ Acute kidney injury (AKI) is becoming more of a focus in the study of patient safety and outcomes. The addition of calculated eGFR to the majority of standard renal function panels has focused attention on kidney injury, particularly in the peri-operative period. In a simple observational study from **Arran and Ayrshire (UK)**,[8] investigators have simply evaluated current care provided to patients following a primary hip or knee arthroplasty at an NHS hospital. A retrospective review of hospital records of 413 consecutive patients forms the basis for this study, all having undergone primary hip or knee arthroplasty over a one-year period. Post-operative AKI was identified in 34 patients (8.2%), however, 96 patients had an increase in creatinine of >25% from baseline which has been associated with a higher incidence of death in some studies. There has been a persistent increase in acute kidney injury, with its associated negative connotations, in patients following total hip or total knee arthroplasty over the past ten years. This may be due to changes in how we define AKI or due to changes in antibiotic prophylaxis or medical care in the peri-operative period. This risk of AKI should be highlighted to patients at the time of obtaining informed consent as it is potentially the most common complication following lower limb arthroplasty and can be easily identified with risk factors including age, pre-existing kidney disease and administration of more than a litre of post-operative fluids. Incidence was not increased in this series with the use of gentamicin or teicoplanin antibiotic prophylaxis or pre- or post-operative NSAIDs. Of these risk factors, multivariate analysis suggested that only age and volume of post-operative fluids remained as significant predictors of AKI. The authors make an interesting suggestion to explain the increased incidence of AKI, attributing it to the widespread use of an enhanced recovery programme. As the programme is designed to encourage early mobilisation, this may result in patients receiving less intravenous fluids. A total of 72% of patients received no intravenous fluids post-operatively. Although there was no causal link identified between patients receiving no intravenous fluids and AKI, this may be due to the small numbers analysed. This important paper highlights an under-reported problem and, in view of the true incidence of AKI following lower limb arthroplasty, more studies are clearly needed in order to identify the risk factors and strategies to avoid it.

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Foot & Ankle

X-ref For other Roundups in this issue that cross reference with Foot & Ankle see: Trauma Roundup 2; Research Roundup 6.

Pain resolution after hallux valgus surgery

■ This article from **Singapore (Singapore)**[1] gives a slightly new perspective on pain relief after hallux valgus surgery. The authors argue that, despite the large number of publications, there are few reporting on pain resolution following surgery. They designed a prospective study of patients undergoing hallux valgus surgery who were prospectively followed. Patients were treated according to the institutional preference and reconstructive surgery was chosen based upon hallux valgus angle, intermetatarsal angle and deformity of adjacent joints. The authors entered 308 patients into the study and reviewed them at both six months and two years following surgery to establish the residual pain levels. Outcomes were assessed using the visual analog scale (VAS), the AOFAS forefoot specific outcome and the 36-item short form survey (SF-36) to assess quality of life. The authors established that 31% (n = 94) of patients had residual pain at six months. Four of these went on to develop osteoarthritis, however, the picture was rosier for the remaining 90 patients, of whom 81% (n = 73) went on to improve their outcomes over the subsequent 18 months. The authors also investigated the potential predictors of poor outcomes. For patients who did not have a resolution of their pain higher pre-operative pain scores and a lower pre-operative mental component of the SF-36 were potentially predictive of ongoing pain following surgery. It is clear that, for many patients, forefoot hallux valgus surgery can be expected to improve their pre-operative pain levels, and that this improvement can be seen to span a two-year period, with outcomes improving between six and 18 months. Some patient selection is obviously required as those reporting disproportionate pre-operative pain levels and with poor performance on the SF-36 mental component score did not do as well as the other patients.

A 'PROMIS' of success X-ref

■ Assessing outcomes is now widely researched but not yet done to death. We are more and more judged on our post-operative results, at a surgeon, institution, and even national level (commissioning of healthcare services, for which there is RCT evidence it doesn't work, is becoming increasingly tricky for healthcare providers). One of the