ROUNDUP360

Knee

Is knee replacement safe in diabetics?

In other areas of surgery diabetes, and in particular poor glycaemic control, has been demonstrated to be associated with adverse outcomes. There is, however, very little data concerning the ramifications of poor diabetic control in those undergoing total knee replacement (TKR). Those industrious chaps at the Kaiser arthroplasty registry **Pasedena (USA)** set about establishing whether there is a potential link between diabetes, glycaemic control and a range of surgical outcomes. To answer the question they designed a retrospective prognostic study (Level II evidence). Patients undergoing primary TKR over an eight-year period were entered into the study, and demographic details including their diabetic status, HbA1C level, comorbidities and outcomes (including DVT, PE, MI, rehospitalisation, infection and revision rates) were recorded. Statistical analysis was adjusted for age, gender, BMI and the Charlson comorbidity index. They included 40,491 patients in their prognostic study, of whom 7567 (18.7%) had diabetes, with overall revision and deep infection rates of 1.1% and 0.7%, respectively. The authors were unable to find any significant link between well-controlled diabetes (HbA1C < 7%) and revision risk (OR 1.32 (95% CI 0.99 to 1.76)) or deep infection (OR 1.31 (95% CI 0.92 to 1.86)). Although in both these cases the OR was > 1.3, the link did not reach significance. Similarly, the investigators found no link between DVT or PE rates. The picture was much the same with poorly controlled diabetics.[1] In a comprehensive study of a large number of patients the authors have effectively demonstrated that there is no increased risk of complications following TKR associated with diabetes. While the naysayers would argue that the proportion of diabetics and infections within the initial 40,000 patients is such that a larger study may be required to demonstrate any link, we would argue that any effect that is small enough not to be seen in a study of this size is so small as to be clinically unimportant.

TKR: a timebomb?

The number of arthroplasties is increasing at a worrying rate, and with a doubling of annual implantations during the last decade within the US this is not just a problem with an aging population; many more are being performed in younger patients. Developed healthcare systems are having to cope with ever increasing demand for arthroplasty which is the focus of much health economic planning. With our Nostradamus hats on, here at *360*, we are perhaps more concerned about the potential issue of TKR in young patients. Researchers from **Boston (USA)** decided to take a scientific approach to estimating the potential future burden of disease and healthcare planning, reasoning that there are currently no accurate estimates of the prevalence or incidence of TKR across the US. The investigators used the Osteoarthritis Policy Model, a validated computer simulation of knee osteoarthritis, and combined this model with the known implantation rate of TKR. Finally these results were combined with annual US census data and two long-term cohort studies (estimating the annual incidence rates of TKR).[2] Although estimates only, the study team suggest that around four million (CI 3.6 to 4.4 million) adults in the US currently live with a TKR, representing a prevalence of 4.2% in the over 50s population. As would be expected, the prevalence is greater in females (4.8% *versus* 3.4%) and increases with age. Based on these estimates the current lifetime risk in the US of a TKR is 7%, and that 50% of adults with a diagnosis of osteoarthritis of the knee will undergo a TKR. Perhaps more worrying is the finding that currently 1.5 million people below the age of 69 have a TKR that may require revision surgery during their lifetime. A sobering thought for those involved in healthcare planning.

Antidepressants for osteoarthritis?

Perhaps not the most natural or intuitive treatment for osteoarthritis is an antidepressant, but this hasn't stopped researchers at Lilly Pharmaceuticals in **Indianapolis (USA)** reporting a secondary analysis of a previously conducted double-blinded randomised controlled trial to establish the effect of duloxetine on osteoarthric pain in the knee. The research team report on a second analysis of a previously conducted randomised double-blinded controlled trial of patients with moderate osteoarthritic pain despite a course of non-steroidal anti-inflammatory agents. The researchers aimed to assess changes on the Intermittent and Constant Osteoarthritis Pain (ICOAP) scale in patients taking duloxetine or placebo, using other previously validated scores of pain severity; Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Brief Pain Inventory (BPI). Using the primary outcome of mean pain difference between duloxetine and placebo at eight weeks there were statistically significant differences in all measures included in the study. The effect estimates with all scores were similar (ICOAP 0.53, pain severity score 0.59, BPI 0.53). The authors conclude that this randomised placebo-controlled trial demonstrates the efficacy of duloxetine as compared with placebo for osteoarthritis-related knee pain.[3] While we are convinced of the results of the study, we are not wholly convinced of the treatment rationale or face validity. It does stand to reason that living with pain has well-characterised psychological effects, including depression, and that treating this pain is important. However, we do wonder if offering patients happy pills rather than treatment for the pain is rather a case of the tail wagging the dog.

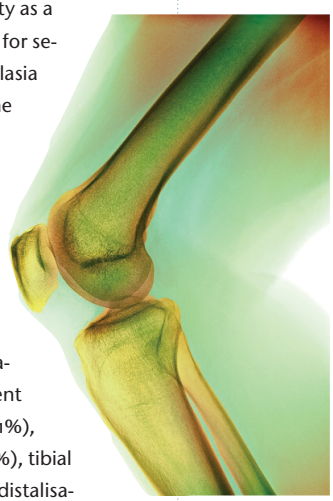
Where's the artery?

Perhaps one of the most important questions in the majority of surgery, but certainly for the enthusiastic

osteotomisers amongst us, is where is the artery? To make matters worse, anatomic studies based on normal knees may not be relevant in the setting of osteotomy for arthritis as the change in geometry of the knee associated with arthritis is likely to change the relationship of the artery. Researchers in **Incheon (South Korea)** set up a study with the aim of evaluating the precise coronal and sagittal location of the popliteal artery during high-tibial opening wedge osteotomy (HTO), and secondarily to confirm the effects (if any) that osteoarthritis has on the traditionally understood anatomical relationships. The researchers designed a prospective case series (Level III evidence) and subdivided the groups into non-arthritic and arthritic knees based on the results of MRI scans of the affected knee. The same MRI scans were used to evaluate the arterial position along a planned osteotomy plane. The distance from the posterior cortex was 13 mm to 14 mm, and the popliteal artery was located between 30 mm and 40 mm (mean 35 mm) from the starting point of the osteotomy plane. With regards to the difference between osteoarthritic and normal knees, while there was a statistically significant difference in sagittal plane position (14.4 mm *versus* 13.6 mm) the differences were of questionable clinical significance.[4] The research team have carefully demonstrated the safe window for osteotomy and of particular clinical relevance is the 'danger zone' of 30 mm to 40 mm after starting the osteotomy, when careful progress and regular fluoroscopy should be available to avoid the neurovascular structures at the back of the knee.

Trochleoplasty a good option

Recurrent patellar dislocation and subluxation can be a really tricky condition to treat. While the majority of adolescent dislocators settle down with age, some do not. These patients are faced with a significant disabling condition that can affect the reliability of their knee enough to impact the long-term performance of their joints. There are several conflicting opinions on how best to treat these difficult dislocators, grouped roughly into patellar realignments, ligament reconstruction and trochleoplasties; there are multiple ways to skin this proverbial cat. Like many conditions with a variety of aetiologies, it seems to us here at *360* that choosing the correct operation is probably more important than anything else in the management of these patients. The Dejour trochleoplasty originated in Lyon, and this month sees the mid-term results published by the grandfather of sulcus deepening trochleoplasty. The group in **Lyon (France)** designed a retrospective case series (level IV evidence) spanning over a decade of treatment with just over seven years of follow-up. A series of 31 knees (27 patients) undergoing trochleoplasty as a primary procedure for severe trochlear dysplasia were included in the study. It is important to note that trochleoplasty was combined with other procedures for the majority of the time (medial patellofemoral ligament reconstruction (16.1%), vastus plasty (83.8%), tibial tuberosity transfer distalisation (51.6%) and medialisation (67.7%), lateral release (67.6%)), making this series, in part, a wide range of disparate combinations of operations. Following surgery, radiological measures all improved significantly with the mean sulcus angle decreasing by 10° (152° to 141°) and tibial tuberosity-trochlear groove distance (TTG) decreasing by 12 mm, as did measurements of patellar tilt (from 37° to 15°). The research group miraculously report no cases of stiffness or recurrence, although the apprehension test remained positive in 20% of cases despite an improvement in the International Knee Documentation Committee scores from 51 to 82. The mean Kujala score was also found to improve significantly (59 to 87) post-operatively. By the time of final follow-up, no patients had any signs of radiological patellofemoral arthritis.[5] The results of this series of patients with trochlear dysplasia is impressive, and despite our reservations about the heterogenous mix of operative combinations and low recruitment rates (fewer than three operations per year in a centre renowned for this surgery), these results certainly support the use of the Dejour trochleoplasty to address trochlear dysplasia in selected patients.



Articulated spacers

One of the difficulties with undertaking two-stage revision in the knee is stiffness developing during the first stage of the procedure, and there are multiple studies clearly demonstrating that the biggest predictor of post-operative mobility is pre-operative movement. Eradication of resistant established infections can require a two-stage procedure and any innovation aimed at reducing stiffness must be welcomed. Surgeons in **Florence (Italy)** have proposed a novel alternative to commercially available spacers or 'home made' static spacers. They propose the use of two custom made antibiotic-loaded space-containing unicompartmental implants to maintain movementbetween the two stages of the procedure. They report the results of nine consecutive cases performed in this manner. The first stage consisted of removal of all infected components, thorough lavage and debridement, followed by implantation of the custom spacer. The second stage was undertaken when laboratory results had returned to normal and cultures were negative. The surgical team were able to eradicate infection in all cases, and amazingly the range of movement was maintained throughout the procedures with a mean improvement in range, post-operatively (105.6° to 110°). As would be expected with this sort of surgery, the clinical outcome scores also improved significantly although only six patients were satisfied with their outcomes.[6] We were slightly bemused to read this article, here at *360* HQ. While we are convinced of the benefits of articulating spacers, particularly in the knee, we were confused about the costings. Perhaps the most expensive implant in existence is the 'dual unicompartmental' knee replacement, especially given there are many 'off the shelf' options offering articulating TKR designs at a fraction of the cost. We are sure this cannot be the cause for the financial meltdown of the Eurozone, but it can hardly be helping.

Mental health and joint replacement

Joint replacement in patients with mental health issues is something of an unknown quantity; the effect of the surgery and associated life event is really unknown, as is the eventual outcome. Surgeons in **Edinburgh (UK)** have attempted to answer a number of these questions with a prospective comparative case series (Level II evidence) of 962 patients undergoing TKR to examine their outcomes over a three-year period. Patients undergoing primary TKR were included in the study and completed the Short-Form (SF)-12 and the Oxford knee score (OKS). The cohort was subdivided according to the results of the mental component of the SF-12 into levels of mental disability. This study really piqued our interest. The mental disability scores had a profound effect on the presentation of, and outcomes following, TKR. Patients who demonstrated any degree of mental disability had significantly greater subjective physical disability on their SF-12 scores. Patients with and

without mental disability enjoyed the same level of post-operative improvement in their disease-specific scores, but interestingly a significantly lower improvement in their overall physical health scores was seen in patients with mental health condition. This effect was offset by a comparable improvement in their mental health scores.[7] It appears from this extremely interesting study that there is a complex relationship between mental disability and recovery following TKR. Although patients enjoy a similar benefit in their disease-specific scores, accompanied by an improvement in their mental disability, they do have higher rates of dissatisfaction and fail to improve in score for the physical component of the SF-12, as seen the patients without mental disability This is certainly an area that requires more in-depth study.

Physiotherapy for meniscal tear?

Things are not looking quite so rosy in the world of arthroscopic knee surgery. Two potentially landmark papers reported in the last edition of *360* called into question the benefit of arthroscopic surgery at presentation (but not if subsequently symptomatic) for ACL ruptures and degenerate meniscal tears. This month sees a paper reported in the *New England Journal of Medicine* asking if arthroscopic debridement is warranted in patients with traumatic meniscal tears. Investigators from a wide range of institutions in the USA designed and conducted a multicentre randomised controlled trial (Level I evidence) in an attempt to answer the study question: "Are meniscal tears, associated with arthritis, best treated with arthroscopic debridement or physical therapy?" They studied 351 patients aged 45 years or older, randomly assigned to physiotherapy or arthroscopic debridement. Outcomes were assessed using the WOMAC score at six months after surgery and results analysed on an intention to treat basis. While both groups improved by six months, the benefit was greater in the surgical group (20.9 points *versus* 18.5 points) and there was a 30% crossover between the non-operative and operative groups. There were no differences in adverse event rates between the two groups.[8] This is not quite another nail in the coffin of arthroscopy as a primary treatment modality, however, the slightly superior outcomes of the arthroscopy arm were not significant. Allowing for the likelihood of around a 30% treatment failure of the conservative treatment group, this study supports the practice of a trial of conservative management. We would love to see a health economic analysis as a secondary outcome of the study. Perhaps that will give a final answer as to what is the best treatment modality.

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