ROUNDUP360

Hip & Pelvis

X-ref *For other Roundups in this issue that cross-reference with Hip & Pelvis see: Knee Roundup 6; Trauma Roundups 1 & 2; Children's orthopaedics Roundup 1.*

Delay to surgery for periprosthetic fracture increases morbidity but not mortality X-ref

The number of total hip arthroplasties (THAs) is increasing every year, a trend that, combined with an ageing population, is leading to a corresponding increase in revision burden. While the wear characteristics of implants are improving, there has been a sharp increase in the number of periprosthetic hip fractures. This rate is now estimated to be between 0.1% and 2.1% for primary THAs and between 3.6% and 20.9% for revision THAs, and accounts for 15% of all revision THA cases. Surgery for periprosthetic fracture (PPF) is often complex, which can result in surgery being delayed in order to medically optimize the patient and ensure that the necessary surgical expertise and implants are available. Previous studies have recommended expeditious surgery for patients with native hip fractures to try to reduce mortality and morbidity. However, the authors of this study from **New York, New York (USA)** felt that data regarding the time to fixation in the PPF group of patients were comparatively scarce, and the studies that have been published have produced some conflicting results.[1] The aim of this study was, therefore, to review the effect of the time to revision surgery on the morbidity and mortality of PPF patients. The authors completed a retrospective cohort study from a national registry of 600 institutions based in the United States. Patients were split into two cohorts based on the time from admission to hospital to surgical fixation: group 1 included patients with less than 24 hours from hospital admission to surgery (expedited); and group 2 included patients with more than 24 hours from hospital admission to surgery. Of the 857 patients included in the study, 402 had expedited surgery and 455 did not. The mean time to surgery was 1.3 days for all patients and 2.4 days in the nonexpedited group. Patients in the expedited group were younger, were less likely to have chronic obstructive pulmonary disease, were more mobile, had a lower American Society of Anesthesiologists grade, and underwent a shorter surgical procedure. The incidence of complications in the expedited group was 10%, compared with 20.7% in those who underwent nonexpedited surgery. Complications included respiratory and urinary tract infections. There was also an increase in the postoperative length of stay in the nonexpedited surgery group. There was no difference in the overall mortality between the two groups. The findings of this study can be helpful for units to develop their own patient pathway for patients who have sustained a periprosthetic hip fracture. Following all the data from patients who have sustained native hip fractures, it can come as no surprise that delaying surgery for patients with PPF leads to worse outcomes. Increasingly, many orthopaedic units in the United Kingdom have orthogeriatricians available to help optimize patients for native hip fracture surgery. Perhaps a similar approach should be used for those patients admitted with PPF. Unlike native hip fractures, delays to surgery can occur due to the lack of a surgeon with the necessary expertise. These delays undoubtedly result in worse outcomes for the patient and an extended length of stay in hospital. While delays to surgery because a patient needs to be medically optimized are understandable and appropriate in most cases, a delay due to the lack of surgical expertise may become unacceptable when increasing number of studies demonstrate poorer outcomes for these patients.

Robotic arthroplasty X-ref

The use of robotic-assisted surgery should be expected to improve the outcomes of joint arthroplasties, due to the improved accuracy of implantation and reduced risk of errors being made. In the shorter term, one might expect periprosthetic fractures and early failures to be lower, coupled with an improvement in outcome scores. In the longer term, more accurate restoration of surgical alignment could result in better outcomes in terms of wear and failure. The evidence and expert opinion, however, are somewhat mixed in terms of outcomes. The authors of this systematic review and meta-analysis from **Sydney (Australia)** aimed to determine the effectiveness of semiactive and active robotic hip and knee arthroplasty on postoperative patient-reported outcomes of function, pain, quality of life, and satisfaction with surgery.[2] The review team utilized all the usual indices (PubMed, Medline, Embase, and CENTRAL) to identify papers reporting their treatments of choice. The authors reported all comparative studies where the effectiveness of semiactive or active robotic-assisted hip or knee arthroplasty was compared with any other surgical intervention. In line with the best practice for systematic reviews, the authors undertook risk-of-bias assessments and the strength of the evidence and analysis was undertaken using random-effects models. Overall, there were 14 studies in the literature suitable for inclusion in the analysis, which reported the outcomes of 1342 patients in total. All studies included in this analysis compared robotic-assisted surgery with conventional surgery. As would be expected with a review including comparative case series, the authors assessed the majority of studies as being at some risk of bias, and the quality of the evidence was rated as low to very low. The major take-home message from this study is that the postoperative functional outcomes are comparable between the active robotic and conventional total hip and knee arthroplasty at all timepoints and with all outcome measures.

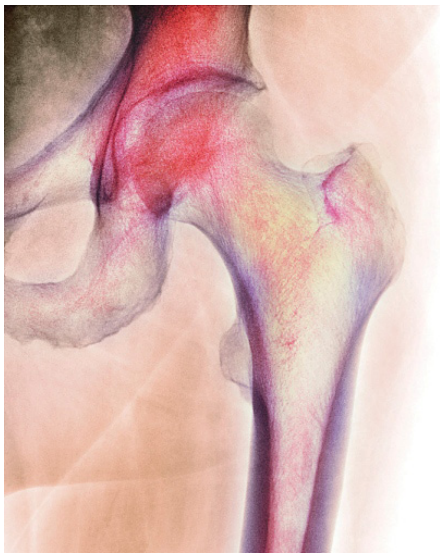
Trendelenburg and the direct lateral approach to the hip X-ref

It seems that for any given question, there is now likely to be a randomized controlled trial. A large number of these are small trials of several hundred patients, or sometimes fewer than a hundred patients, usually recruited in a single centre. There is a temptation to write these trials off as

unimportant. However, although often not powerful enough to detect a small but meaningful effect size, these studies add to the body of knowledge (in terms of contribution to meta-analysis) and can answer simple questions without the risks of bias seen in other study designs. This study from **Kristiansand (Norway)** reports one such trial, which investigated whether the approach for hemiarthroplasty following hip fracture has an effect on the rate of positive Trendelenburg gait.[3] Their trial ran for three years and recruited 150 patients with a follow-up of 12 months. Patients were randomly allocated to either an anterolateral or a direct lateral approach to the hip for their hemiarthroplasty. Blinded assessments at 12 months was undertaken by a physiotherapist who collected both the presence of a Trendelenburg gait and patient-reported outcome measures at three and 12 months. The direct lateral approach was associated with more positive Trendelenburg tests (n = 11) than the anterolateral approach (n = 1). The Trendelenburg positive group also reported poorer Hip Disability Osteoarthritis Outcome Scores. However, there were no other particularly significant differences between groups. This study has a simple message: patients who have a true anterolateral approach are less likely to have a positive Trendelenburg gait, and – in this study, at least – there is a suggestion that this will improve long-term outcomes.

Are oral anticoagulants the way forwards?

Oral anticoagulants have been an approved alternative to low-molecular-weight heparin (LMWH) following total hip arthroplasty (THA) for over a decade now; however, we still do not fully understand their relative merits and drawbacks. It is accepted that patients having a large total joint arthroplasty require anticoagulation, but there is some disagreement as to whether this extends beyond the inpatient episode. There is further debate surrounding the suitably of aspirin as an anticoagulant, and yet more surrounding the newer oral anticoagulants (predominantly the factor Xa inhibitors). There is still insufficient data to support oral anticoagulants as efficacious treatment for prophylaxis following joint arthroplasty, and this is the focus of this registry study from **Stockholm** and **Gothenburg (Sweden)**.[4] Although the study does not provide definitive answers, it is certainly worthy of review, not least because of its large number of patients. Using routinely collected healthcare data in the Swedish Hip Arthroplasty Register, The study team were able to identify 32 663 THAs undertaken between 2008 and 2012 (selected from a total of 78 066 after



the application of exclusion criteria). All of the patients had undergone a unilateral THA, had no history of thrombotic events, and had not taken thromboprophylaxis of any type in the six months leading up to the operation of interest. These were subdivided into groups who had received an oral anticoagulant (dabigatran or rivaroxaban; 5752 patients) or LMWH (26 881). Unusually, the authors confirmed the administration of medications through data linkage to a national prescribing database. For the purposes of this report, the primary outcome measures (defined as occurring within 90 days of surgery) were symptomatic deep vein thrombosis (DVT) or symptomatic pulmonary embolism (PE). Both symptomatic DVT and symptomatic PE were statistically lower in the oral anticoagulant group. There were no statistical differences between the cohorts with respect to the secondary outcomes of mortality, reoperation, or recorded bleeding rates. Overall, these authors report that the risk of symptomatic DVT was lower in the group that received new oral anticoagulants than in the group that received LMWH (0.3% *vs* 0.6%; odds ratio (OR) 0.47). As one might expect given the markedly higher event rate in the LMWH group, the risk of symptomatic PE was lower in the oral anticoagulant group (0.1% *vs* 0.4%; OR 0.36). The authors could not find any differences from a coding data perspective between the two groups in risks of bleeding events or death. The authors acknowledge the limitations of their dataset, which include its retrospectivity, the heterogeneity of the regimens employed within both groups, and the fact that there is likely to be under-reporting of more minor postoperative bleeding complications. Nevertheless, the differences shown are fairly substantial: symptomatic DVT halved in the oral cohort, while symptomatic PE was reduced by 75%. At a time when scepticism may be found about anticoagulants within the orthopaedic arthroplasty community, the results reported here suggest they should not be written off just yet.

Total hip arthroplasty *versus* hemiarthroplasty in the hip fracture group X-ref

Despite the huge pathology burden of hip fracture and the rising number of patients suffering hip fractures, patients with increasingly active lives expect high performance in the longer term. Following a number of small randomized controlled trials (RCTs), there has been growth in the use of total hip arthroplasty (THA) to treat patients with hip fractures. There is now national guidance in a number of countries recommending the use of THA for a broad portion of the population. However, there appears to be a degree of evolving concern within the orthopaedic community regarding the current recommendations, which are wide-ranging but not always entirely supported by the evidence. This paper from **Oxford (UK)** neatly uses two methodologies to assess the suitability of recommendations to particular groups of patients.[5] First, the authors undertook a systematic review and meta-analysis of existing RCTs. In order to optimize the clinical relevance of the findings, they applied inclusion/exclusion criteria, limiting studies to those that excluded patients demonstrating cognitive impairment or limited mobility prior to injury. The rationale for this was to make their findings as relevant as possible in the light of national guidelines from the National Institute for Health and Care Excellence (NICE) and other organizations, which have specified that THAs are to be offered to patients with normal cognitive and ambulatory function prior to fracture. At the same time, in acknowledgement that this methodology yields a relatively small number of patients for inclusion in the meta-analysis, the paper also describes the findings of the authors' own observational study. This includes a cohort of 143 871 patients identified from the British National Hip Fracture Database between 2011 and 2017, corroborated against Hospital Episode Statistics (HES) data. Propensity score matching was applied to minimize biases in the comparative cohorts, giving a subgroup of 12 290 patients on which the outcomes of this study were selected. The key findings from the systematic review/meta-analysis were: a nonsignificant trend towards higher dislocation rates with THA; higher revision rates following THA (although this effect reduced following the exclusion of a single paper that trialled a nonstandard THA implant); and a statistically higher mortality up to 12 months following

hemiarthroplasty (15%) *versus* THA (9%). No statistically significant difference was found for the following: 30-day readmission rates; 36-Item Short-Form Health Survey (SF-36) and EuroQol five-dimension (EQ-5D) quality-of-life scores; length of stay (which was shorter for THA following adjustment for covariables); and time to surgery (although two RCTs demonstrated a difference of approximately one hour with THA within the propensity score matched cohort). The duration of surgery was statistically longer for THA, albeit only by 15 minutes, which the authors note is unlikely to be of clinical relevance. There were higher rates of discharge to the patient's own home after THA (albeit only within the propensity score matched cohorts), and one paper showed a marginally superior functional outcome with THA. While the authors are careful to acknowledge the potential for confounding, even with well-designed RCTs (for example, surgical approach and its effect on dislocation), they conclude that concerns about the increased provision of THA leading to clinically significant delays for hip fracture patients appear to be groundless. The authors also surmise that there is no evidence to suggest that dislocation or revision rates are higher outside the context of clinical trials. Notwithstanding the limitations, these conclusions appear to be supported by the data presented.

Bioglass bone cement X-ref

■ Bioglasses are promising materials that are yet to find their application in orthopaedic surgery. Bioglasses are bone compatible and biocompatible, and are known to osseointegrate. The most commonly used bioglasses are 45S5 glass, named due to its 45% silica content and 5:1 ratio of calcium to phosphorus. It is this high calcium-to-phosphorus ratio that results in the biocompatibility and osseointegration properties. We were interested to see this long term follow-up study from **Kyoto (Japan)** describing their experiences using bioglass-based cement.[6] Their cement was a locally developed apatite-wollastonite glass-ceramic powder and bisphenol-a-glycidyl methacrylate resin, and is a bioactive bone cement (BABC). The authors describe the long-term follow-up of their unique bone cement used to fix cemented acetabular components in the 1990s. Their trial reports the outcomes of 20 total hip arthroplasty patients who had a BABC cementation to the acetabular component. All of the patients were young, with a mean age of 57 years, and the results are reported using survival analysis. The authors report a mean follow-up of just over 17 years, with two patients lost to follow-up. The overall loosening-free survival rate was 85% at ten years and 70% at 20 years, while the implant retention rates were 95% and 85% at ten and 20 years, respectively. These results are on the lower end of what can be achieved with traditional methods and so, although BABC has advantages to bone ingrowth and a favourable biocompatible approach, the authors hypothesize that the mechanical properties may be to blame for the poor longevity.

The natural history of patient-reported outcome measures for total hip arthroplasty

■ In these days of accountability, payment by results, and heightened patient expectations, patient-reported outcome measures (PROMs) are routinely collected on almost all patients undergoing total hip arthroplasty (THA). However, despite these vast volumes of data, we are uncertain of what to do with all the results. Although most PROMs in common use are now validated, the responsiveness to change over time – and, indeed, the best way to interpret monitoring PROMs – is not entirely clear. In this timely paper from **Boston, Massachusetts (USA)**, the authors set out to establish the improvement seen in a range of commonly reported PROMs after undergoing THA.[7] Secondarily, the authors were able to describe the natural history of PROMs. Overall, the authors recruited 976 patients into their prospective, multicentre study. PROMs reported included the Harris Hip Score (HHS), the 36-Item Short-Form Health Survey (SF-36) Physical Component Summary (PCS), the SF-36 Mental Component Summary (MCS), and the EuroQol five-dimension (EQ-5D) index preoperatively and at regular intervals until seven years following surgery. As would be expected with THA, the improvements from the baseline score were marked in each of the PROMs reported. However, there were lesser improvements in the HHS in those with self-care issues, while anxiety or depression dampened the improvements seen in the PCS and EQ-5D scores. Deterioration in scores over time was associated with obesity, other joint pain, and difficulty in self-care. This paper is useful in that it quantifies the complex interplay between comorbidity, mental health, and outcomes following THA, as measured by a battery of commonly used PROMs.

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Knee

X-ref ***For other Roundups in this issue that cross-reference with Knee see: Hip & Pelvis Roundups 2 & 6; Sports Roundups 1, 3 & 4.***

How to measure an acceptable result in total knee arthroplasty

■ A research team from **Boston, Massachusetts (USA)** have investigated the interpretation of patient-reported outcome measures (PROMs), reasoning that the acceptability of the joint arthroplasty to the patient is a good bar to measure against.[1] The authors designed a study to assess the patient acceptable symptom state (PASS) for PROMs at one and three years following total knee