

# ROUNDUP<sup>360</sup>

## Hip & Pelvis

**X-ref** For other Roundups in this issue that cross-reference with Hip & Pelvis see: *Knee Roundups 3, 5; Wrist & Hand Roundup 5; Spine Roundup 5, Trauma Roundups 1, 2, 5, 7, 8; Children's Orthopaedic Roundup 6; Research Roundups 1, 2, 4, 5, 6.*

### Hip arthroplasty more complicated in the mentally unwell **X-ref**

■ Surgeons in **North Carolina (USA)** have undertaken an interesting retrospective database study, designed to compare medical and surgical complication rates between two cohorts undergoing total hip arthroplasty, some with and some without mental health diagnoses. The study aims to answer the question, do mental health diagnoses have an effect on complication rates?<sup>1</sup> The outcomes were compared between a control group of 591 000 patients and 87 000, all with 'psychiatric disease' (depression, schizophrenia or bipolar disorder). Patients were identified from the Medicare database with linkage performed between ICD-10 codes, allowing patients undergoing total hip arthroplasty to be linked to their mental health diagnoses (if indeed they had one). Outcomes were assessed at two years, but in essence only 'codeable' complications recorded as a post-operative complication or requiring a further healthcare episode were captured. In the psychiatric disorder group, the authors report that at 90 days there were increased rates of 13 of the 14 listed medical complications,

and at two years there were increased rates in five out of six surgical complications, including infection, dislocation, periprosthetic fracture and revision. Their literature review attempts to understand these phenomena in terms of possible biochemical changes seen systemically in patients with psychiatric diagnoses and makes for stimulating reading although it is (for the most part) conjecture. The authors' overall conclusion - that these data should prompt arthroplasty surgeons to undertake appropriate counselling pre-operatively in such patients - is worthy of note and is a new finding.

### A small piece in the hemiarthroplasty puzzle **X-ref**

■ Debate is still ongoing regarding the relative risks and benefits of stem cementation when undertaking arthroplasty procedures for neck of femur fractures. On the one hand there are concerns over the systemic and cardiovascular effects of cement in this physiologically relatively weak patient cohort. Conversely, however, the poor bone quality of many hip fracture patients has potential negative implications for the use of uncemented implants (whether hydroxyapatite-coated or not), which rely on bony biological processes to achieve satisfactory long-term fixation. An interesting randomised study from **Stockholm (Sweden)** is worthy of inclusion in this month's 360 roundup.<sup>2</sup> Initially conceived as two separate studies

looking at hemiarthroplasty and total hip arthroplasty (THA) respectively, the two studies were pooled midway through the project due to low recruitment numbers. Not exactly 'gold standard' methodology, however, this is more than illustrative of real world research in a difficult-to-study patient cohort. In a therefore slightly complex study design, all patients were randomised to receive either a cemented Exeter or uncemented Bimetric stem; those aged between 65 and 79 years received a THA with cemented polyethylene socket, those aged 80 years and over, a monopolar hemiarthroplasty. This made the results perhaps more generalisable to day-to-day clinical practice. Among the 67 patients receiving cemented stems, there were no intra-operative fractures, compared with nine from the group of 74 receiving an uncemented implant. Additionally, there were no differences in mortality rates between the two groups. Conversely, however, a substantial number (though not all) of the scoring assessment tools used demonstrated significantly better symptomatic and functional outcomes with cemented prostheses. Although the numbers are relatively small, this study clearly provides food for thought for all surgeons treating intracapsular fractures, suggesting substantial benefits to the use of a cemented stem, no increase in associated mortality rates and fewer intra-operative complications. Detractors would

argue that this study may be underpowered for mortality as a primary endpoint, however, it certainly constitutes an important piece in an increasingly clear jigsaw.

### A second look at cement in trauma **X-ref**

■ Following on from the Swedish paper, this study from **Ahvaz (Iran)** again looks at the relative risks and benefits of stem cementation, this time in 51 patients over the age of 65 years, all of whom underwent hemiarthroplasty (not THAR) for a fractured neck of femur.<sup>3</sup> While this study is not randomised (indeed it is not explained how patients were allocated to receiving cemented or uncemented stems), its findings correlate with those of the group from Stockholm. Of the 22 patients receiving a cemented stem (all received a bipolar hemiarthroplasty), 21% sustained an intra- or post-operative complication. This rate was significantly higher in the 29 who were treated with an uncemented prosthesis (31%), who also had higher pain levels post-operatively than those receiving uncemented implants. HSS scores at four and 24 weeks were better in the cemented group (although there are no data on pre-operative symptomatic and functional levels). Although far less robust than the data from the Swedish RCT, this again clearly provides food for thought for all surgeons still considering the use of uncemented stems in the hip fracture context.

### A fresh look at resurfacing?

■ It is easy to confuse the concerns surrounding metal-on-metal

arthroplasty and the concept of hip resurfacing. The complication profile is different, and although the two often go hand in hand, given the tribological restrictions on larger bearing surfaces it is important perhaps to remember that resurfacing as a concept does not necessarily require a metal-on-metal bearing, and that difficulties with many resurfacings are due to the tribology of the bearing surface and not necessarily the concept itself. At a time when hip resurfacing has largely fallen from favour due to concerns over adverse reactions to metal debris, it is interesting to read this series describing the seven- to ten-year results of a metal-on-polyethylene (MoP) hip resurfacing arthroplasty system. Running the risk of high wear rates due to adhesive wear, large sliding distances and restrictions on the thickness of the polyethylene, 'hard-on-soft' resurfacing was largely abandoned in the 1990s due to the high wear rates associated with the larger head size. However, things have moved on in surface technologies and hence surgeons from **Washington (USA)** have reported their results of a prospective series of 190 patients (all of whom were self-selecting) who underwent hip resurfacing rather than total hip arthroplasty.<sup>4</sup> The series reports hip resurfacing using highly cross-linked polyethylene, with the rationale that the perceived improvement in wear properties of the highly cross-linked polyethylene may allow for the potential benefits of hip resurfacing without the drawback of a metal-on-metal bearing surface. Although some previous authors and surgeons have expressed serious concerns over the possibility for delamination and catastrophic failure within the weight-bearing portion of the acetabular liner when manufactured from polyethylene, this particular series certainly makes a reasonable case for such a system. Survivorship at between seven and ten years was 97%, and perhaps more importantly there were substantial

improvements in patient satisfaction scores following the procedure. A subgroup of 51 patients also underwent metal artefact reduction CT scanning post-implantation as part of osteolysis surveillance, and CT visible osteolysis rates were found to be only in the region of 2%. While further evaluation and longer-term follow-up are clearly required for wider interest to develop in the use of such a system, these early results are certainly promising, suggesting that with a few design tweaks, resurfacing as a concept may not be consigned to the scrapheap just yet.

#### **Tranexamic acid in hip arthroplasty surgery X-ref**

■ Many readers of *360* will use tranexamic acid (TXA) as a matter of routine for patients undergoing THA. Thus far, the most definitive paper in support of this approach to cross the editorial desks here at *360* is from the **Araba University Hospital (Vitoria-Gasteiz, Spain)**. Giving blood transfusions to patients because of blood loss sustained during a THA is not without risk, being associated with transmission of infections and immunological reactions, among others. In addition, blood is an expensive and limited resource. Tranexamic acid has risen to the fore in common practice and is an antifibrinolytic that has been shown to reduce blood loss in many types of surgery, including THA. Debate, however, continues as to the best treatment regimen. The authors of this study<sup>5</sup> conducted a randomised, double-blind, parallel group, placebo-controlled trial in two hospitals. All patients with ASA I-III, aged 18 years or older and with no known allergy to TXA were invited to participate. However, there were a number of exclusions including severe vascular ischaemia, history of venous thrombosis and pulmonary embolism (PE). Patients were randomised to one of three interventions: single dose of TXA, double dose group and a placebo control group. The trigger to transfuse was set at Hb 8.5 g/dl under normovolaemic conditions, and at 9

g/dl in cases of moderate cardiac or respiratory disease or symptoms of acute anaemia. Although rather small in eventual analysis, with 35 patients from the single dose group, 36 from the double dose group and 37 from the placebo group, there were some important findings. The study confirms that TXA does reduce bleeding, up to the second day following surgery. However, there was no difference between the intervention groups in terms of estimated blood loss. There was, on the other hand, a difference in blood transfusion rates (22.9% single dose vs 11.1% in the double dose group and 37.8% in the control group).

In summary, we should all seriously consider using TXA in patients undergoing a THA. At present there is still not sufficient evidence to conclude whether one pre-operative dose and one post-operative dose is any better than a single pre-operative dose, and only weak evidence to support a single dose regime.

#### **Reducing complications in anterior hips**

■ The overwhelming success of total hip arthroplasty is one of the medical miracles of the 20th century. However, despite the great benefits that can be achieved, surgeons continue to innovate in attempts to improve what is one of the most successful medical treatments. Use of the direct anterior approach to the hip (DAA) is gaining popularity, mainly due to perceived benefits of earlier post-operative recovery and the lower dislocation rate associated with a technique that is muscle sparing. The steep learning curve and reported complications in the hands of an inexperienced surgeon have discouraged experienced surgeons from trying 'something new'. The common complications associated

with the DAA include femoral shaft fracture, component misalignment, anterior dislocation and wound complications, with some series reporting an incidence as high as 9% for major complications and a 6.5% early re-operation rate. Using what the authors from **Juntendo University (Tokyo, Japan)** rather hopefully term 'countermeasures'<sup>6</sup> may, however, reduce these complications and help keep the unwary out of trouble. The measures evaluated in this study include: exclusion criteria for DAA; no positioning table; use of fluoroscopy; and experienced assistant having performed over 100 procedures.



The authors also excluded the procedure for surgeons new to the DAA in patients with a previous history of osteotomy, or femoral abnormality (Perthes, or developmental dysplasia) and soft-tissue contractures.

The modified technique described utilised fluoroscopy to aid in the osteotomy level of the neck, reaming of the acetabulum and position of the components during both trial and implant insertion. The authors applied this technique to three surgeons starting to undertake DAA, and reported the results of the first 40 procedures performed by each using their 'countermeasures'. As perhaps would be expected, there was a fairly long operating time of 117+/- 27 minutes, and over one minute of fluoroscopy was used. Amazingly, however, the authors report no intra-operative complications and no re-operations. There was one late anterior dislocation which was treated by a closed reduction and had no further dislocation. Having compared their early results with those in the published literature, the authors concluded that they had demonstrated a lower complication rate by employing these four measures.

## Having your cake and eating it? The outcomes of ERAS X-ref

■ In the era of bundled payment in the majority of Europe and the United States, the focus of healthcare systems is moving from a 'quality' agenda to a 'value' agenda. One of the best methods for cost containment which has become more and more popular in hospitals worldwide is the 'enhanced recovery programme'. These pathways aim to decrease hospital length of stay without compromising patient outcome. Most focus on peri-operative anaesthetic optimisation, physiotherapy and planned stays. Although minimally invasive surgery was lauded as a potential benefit, multiple studies have shown that this does not affect the length of stay. In this study conducted at the **Royal Infirmary of Edinburgh (UK)**, the authors implemented pre-operative physiotherapy and occupational therapy, provided patient literature, and a periarticular local anaesthetic injection was used in order to reduce length of stay.<sup>7</sup> Unusually, the authors report not only their outcomes in terms of resource use, but also their outcomes in terms of functional scores, 18 months post-operatively. The study team report the effect of

their programme on a serial cohort of 1161 patients, all undergoing total hip arthroplasty with and without an enhanced recovery programme. The study reports the outcomes of 611 treated without the enhanced recovery programme and 550 treated with the programme. The study team undertook multivariate analysis to adjust for confounders and were able to report that implementing this programme resulted in a decreased hospital stay of 1.5 days. Mortality and dislocation rates were similar between groups, while the Harris Hip Score and SF-36 score improved. Utilising an enhanced recovery programme is clearly beneficial after total hip arthroplasty for both the patient and the hospital system, and without compromising longer-term outcomes.

### Hip dislocation due to 'silent' trunnion corrosion

■ It is always tempting when things don't quite work out, and the patient suffers a complication, to find a reason or excuse as to why this might have happened. We can admit to being slightly cynical here at 360 on encountering this report on 'silent' trunnion corrosion being responsible for late hip dislocation. However, in what is a short paper describing ten cases of hips revised in **Vancouver (Canada)**,

the authors make a fairly compelling argument that pseudotumour formation can be seen in metal-on-polyethylene hips, and that this can present as a late dislocation.<sup>8</sup> The authors present a case series of ten MoP THAs with delayed dislocation, and demonstrated that pseudotumour is an infrequent (and often unsuspected) but important contributor to delayed instability following MoP THA. In their series, the patients presented at around five years following primary hip replacement, and in all cases there was histological confirmation of adverse local tissue metal reaction. The authors make the valid point that pseudotumour formation, due to its rare incidence in MoP hips, is often not on the list of differential diagnoses, however, malaligned components can result in increased trunnion forces and fretting corrosion, just as they can at an articulating surface. It is clearly better to establish this diagnosis prior to revision, as the rates of complications are high and a revision of this nature would ideally be undertaken by a surgical team experienced in the management of adverse metal reactions.

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## Knee

**X-ref** For other Roundups in this issue that cross-reference with **Knee** see: **Wrist & Hand Roundup 5, Trauma Roundup 5, Research Roundups 1, 3, 4, 5, 6, 7.**

### Patient-specific instrumentation no good in UKA

■ As with all joint arthroplasties, there is good evidence to support the idea that correct positioning of the unicompartamental knee arthroplasty (UKA) implant is vital to ensure both good function and implant

survivorship. Despite the potential innovations of computer-assisted surgery and robotics there is little evidence to support their use, and there are ongoing concerns regarding cost and the additional surgical times. Patient-specific instrumentation (PSI) is now commonplace and available in many institutions. An MRI-based imaging protocol is used to print 3D bespoke cutting blocks to guide the frontal and sagittal cuts on the tibia and the distal femoral cut. These authors from **Aix-Marseille**

**University, Marseille (France)** designed a randomised controlled study with 60 patients divided into two groups using either the PSI technique or the conventional technique, and outcomes were assessed using gait analysis and component positions.<sup>1</sup> There were no reported statistical differences between the two groups in terms of gait analysis at one year, nor in component alignment or functional scores at three months and one year after surgery. There have been some commentators (including

a letter to the Editor<sup>2</sup>) suggesting that, given the lack of difference in outcomes between the two templating approaches, PSI would benefit a relatively inexperienced surgeon. However, here at 360 we would interpret the data differently. Surely we should be careful of advocating PSI as a replacement for experience? The PSI technique is not infallible and to make the most of PSI, the surgeon surely needs a good understanding not only of the technique and how the instrumentation works, but of the