

# ROUNDUP<sup>360</sup>

## Hip & Pelvis

*For other Roundups in this issue that cross-reference with Hip & Pelvis see: [Knee Roundups 1, 5 and 7](#); [Trauma Roundup 5](#); [Research Roundups 3, 5 and 6](#).*

### Sports and total hips

■ There are few boundaries left for patients undergoing total hip replacement (THR). One of the final frontiers in hip arthroplasty surgery is that of sport participation following a THR. There are not many papers, however, aimed at establishing exactly where this frontier actually lies. An interesting paper from [Marseille \(France\)](#) aims to fill this large void in the orthopaedic literature.<sup>1</sup> The result of their efforts is a superbly constructed review of over 500 THRs with a mean follow-up of nearly ten years. The study is designed to identify the level of sporting activity, in addition to factors that are predictive of return to sports and exercise. The authors then attempt to establish if there is a correlation between participation in sport and patient satisfaction after THR. The study included 815 patients who had undergone THR over a ten-year period, with a total of 571 patients (71%) meeting the inclusion criteria who completed a self-directed evaluation devised specifically to include the UCLA activity score in addition to questions exploring obstacles in returning to sport. Those patients who did not return to sport cited their reasons for not doing so as: fear of dislocation (32%), avoiding wear (25%), and surgeon recommendation (17%). Interestingly, but not

surprisingly, the study team did find a significant relationship between sport participation in those patients with a higher pre-operative Harris hip score and those motivated to participate in sports. There was a surprisingly high number of patients who were able to return to sports post-operatively, with around two thirds of patients returning to sporting activities (as defined by a score > 5 on the UCLA scale). This is one of the single most comprehensive and informative manuscripts on the topic of returning to sport in post THR patients to date. We wonder here at 360 if changes in post-operative surgical advice would yield even higher rates of return to sport activities.

### Topical tranexamic acid and blood conservation in hip replacement

■ While there has been a host of innovations in the field of lower extremity replacement surgery, including anaesthetic and prosthetic advancements, one of the most revolutionary changes has been with blood conservation techniques, particularly with antifibrinolytics such as tranexamic acid. Slightly at odds with other innovations in arthroplasty practice, there is a wealth of high quality data surrounding the use of tranexamic acid in the peri-operative period surrounding total joint replacement (TJR). Researchers in [London \(UK\)](#), catching the surge of interest in the use of topical and IV tranexamic acid, which can potentially provide better localised control of peri-operative bleeding,

set out to establish what the current 'state of the nation' is with regards to tranexamic acid use in TJR. This extensive and well written systematic review and meta-analysis of all Level I studies included 14 randomised controlled trials (11 in knee replacement, two in hip replacement and one in both).<sup>2</sup> The analysis of these well conducted studies suggested that topical tranexamic acid significantly reduced the rate of blood transfusion (TKR: risk ratio (RR) 4.5; THR: RR 2.6). In addition, the rate of thromboembolic events with topical tranexamic acid was similar to those found with a placebo. This paper is the single most comprehensive meta-analysis on the efficacy and safety of topical tranexamic acid. While the evidence it presents is conclusive with regards to the role of tranexamic acid in general, there is still a bit of a knowledge gap with regard to comparison of topical and systemic tranexamic acid. The research teams at the Mayo Clinic (Rochester, USA) and Hospital for Special Surgery (New York City, USA) are currently, however, recruiting to their multicentre randomised clinical trial to directly compare the efficacy of topical tranexamic acid to IV tranexamic acid. We wait with baited breath for their results.

### Blind spots and biases in hip research

■ Two interesting yet flawed papers piqued our attention this month at 360. The authors of the first have a blind spot in their study design. Reasoning that the success of total hip replacement (THR) is to a greater

or lesser extent reliant on acceptable cup placement, a research team from [Boston \(USA\)](#) designed a study to evaluate the utility of intra-operative fluoroscopy to aid placement of cup orientation.<sup>3</sup> The research team chose to establish if the use of fluoroscopy led to more accurate positioning in the Lewinnek safe zone, if there was a learning curve associated with its use and, finally, if operative times were increased or leg lengths affected in any way. In an impressive execution of their study, the research team were able to include a consecutive series of 109 consecutive patients all undergoing THR for various indications over a 24-month period. The surgical team performed the first 52 operations with freehand component positioning and switched to fluoroscopy-aided positioning after this. Outcomes assessed included radiographic measurements of version, abduction and leg length discrepancies, undertaken at the initial six-week follow-up visit. In terms of positioning of the components, there was a clinically relevant and significant improvement of component positioning with the use of fluoroscopy. Sadly, although this is an impressively conducted study in execution, the conception is subject to a significant blind spot. The study team decided to use the outdated Lewinnek classification – aiming for the 'safe zone'. The authors report an initial poor component positioning in the lateral position. This said, their study clearly describes an improvement in the accuracy of component

positioning when using fluoroscopy. We have no reason to suppose that this wouldn't be seen with surgeons aiming for different component positions.

### No recurrence in cam lesions at two years

■ The difficulty with certain operations is that no matter how well you do them, a certain proportion will need doing again. Surgeons struggling with Dupuytren's contracture, scoliosis, osteochondral lesions and adhesive capsulitis, amongst many other conditions, will know well the infuriating recurrence rates. Although it has never been studied, one might expect that the resection of a cam lesion, leaving a raw area of bone likely to heal with callus, might result in an appreciable recurrence rate. Using the alpha angle as a marker of the presence of a cam lesion, researchers in **Maywood (USA)** set out to establish if the mid-term radiographic outcomes of cam lesions were supportive of longer-term improvements.<sup>4</sup> There are no long-term outcomes assessing surgery for cam deformity at a two-year follow-up. The study team designed a prospective two-year cohort follow-up study of 47 patients, all of whom had undergone femoral neck cam resection. Participants were, as expected, predominantly male (60%), with a mean age of 37 years and with follow-up achieved to just over two years (28 months). The patients had an alpha angle corrected from 70° (60° to 97°) to around 43° (32° to 50°). There was no progression over the two-year follow-up of the study, with a mean two-year alpha angle of 43° (32° to 54°). Similar sustained improvements of femoral offset were seen (pre-op 3.7 mm to 7.8 mm). In support of other outcome studies, the patients' clinical outcome scores improved significantly. This simple outcome study has clearly demonstrated that the recurrence rates for femoral impingement lesions are low and patients achieve a sustained clinical improvement. While the results as presented here do appear

to be highly positive, one can't help but wonder if the bias of the authors doesn't show through more than a little. Radiographic outcomes of cam lesions are hotly debated; the only certainty presented by this paper is that burring away a cam lesion doesn't result in it reforming within two years.

### To drain or not to drain?

■ A duet of recent papers caught our eye here at 360, returning to the age-old question of closed suction drainage following hip surgery. Potentially a question that will never be resolved, the proponents point out that haematoma formation is not ideal and likely to result in higher infection rates, arguing that drains reduce this. Others argue that 'closed' is a relative term and infection rates are increased by failing to completely close the skin. In the first of these papers, a study team in **Shijiazhuang (China)** conducted a systematic review and meta-analysis of randomised controlled trials to compare the outcomes of patients treated with or without a closed suction drain in hip replacement.<sup>5</sup> The review team included only randomised or quasi-randomised controlled trials indexed in the major medical databases. The review was based on the results of 16 studies reporting the results of 1663 patients, all undergoing hip replacement and randomised to either closed suction drainage or traditional treatments. A thorough meta-analysis for all potential and commonly reported adverse outcomes including haematoma formation, incidence of dehiscence or deep vein thrombosis, was undertaken. The review team also established the outcomes with regards to wound infection and range of movement. Amazingly,



ingly, despite the large sample size and reasonable methodology, the review team was unable to establish any significant differences in adverse outcome measures between either group, although they did note a higher post-operative infection rate in the closed suction group.

■ Taking a slightly different approach to the question, a surgical team in **Tokyo (Japan)** recruited patients into their prospective study undergoing bilateral hip arthroplasty and placed a drain on one side but not the other – providing the 'perfect' control group.<sup>6</sup> The study was designed to establish if the presence of a closed suction drain improved short-term clinical outcomes and peri-operative recovery. This interesting angle on closed suction drainage allowed the authors of this study to compare outcomes between the two operated hips. They undertook a fairly detailed evaluation and measured pain scores, wound thermography and CT cross section of both thighs in the post-operative period. The study team recruited 102 hips (in 51 patients as all provided their own internal controls) in order to establish the effects of closed suction drainage in this cohort. There was earlier post-operative recovery with faster achievement of straight leg raising and active weight bearing on the drained side. Their findings suggested that this earlier post-operative recovery was due to reduced post-operative inflammation and hence better pain control and earlier joint function recovery (with smaller cross-sectional areas, pain scores, and peri-wound pain scores). An interesting and fresh take on an age-old question. We do wonder if these canny researchers may be on to something.

### Sonication and diagnosis of implant-associated infection

■ Sonication is a technology that continues to bubble away in the background with a steady stream of interested clinicians and scientists turning out a constant stream of relatively straightforward papers highlighting the potential importance of this technology. A review team in **Heidelberg (Germany)** have recently published a nice refinement to this technique.<sup>7</sup> Sonication works by treating explanted implants with ultrasound in order to move planktonic and adherent bacteria from the implant into a suspension, thereby facilitating culture, molecular and genomic analysis. In acute purulent infections there is often little diagnostic difficulty. However, in more indolent infections it can often be difficult to establish if low grade or 'subclinical' infection exists in patients with early and unexpected implant loosening. This is the scenario in which implant infection cannot be easily excluded and the added sensitivity given by sonication may be particularly useful. This team of scientists report on the use of sonication in a clinical setting where the diagnosis is unknown, finding sonication to increase the likelihood of bacterial detection. They comment that, given the high risk of biofilm formation and the increased sensitivity of sonication, it should be considered a useful adjunct in patients where the diagnosis is not clear.

### Biomarkers and periprosthetic infection x-ref Knee, Foot & Ankle, Shoulder & Elbow, Research

■ In a slightly different take on the 'is it infected or not', Dr Parvizi and colleagues in **Wynnewood (USA)** report on the potential for improved detection of periprosthetic infection using synovial fluid biomarkers.<sup>8</sup> Biomarker technology is one of the most rapidly advancing fields in translational medicine and offers a tantalisingly rapid lab-to-clinic pathway. These investigators used synovial fluid samples from 95

patients presenting with hip or knee revision arthroplasty and assessed the diagnostic characteristics of 16 potentially useful biomarkers as a method for the diagnosis of periprosthetic infection. The cohort was classified using the Musculoskeletal Infection Society (MSIS) criteria into 29 infected and 66 aseptic joints, all of whom were undergoing revision. Synovial fluid aspirates were taken and immunoassays tested for a range of biomarkers, and their sensitivity and specificity analysed using receiver operating characteristic curves. Of those tested there were five biomarkers that were 100% sensitive

and specific for infection; human  $\alpha$ -defensin 1-3, neutrophil elastase 2, bactericidal/permeability-increasing protein, neutrophil gelatinase-associated lipocalin, and lactoferrin. A further eight less sensitive markers achieved an AUC of  $>0.9$ . With these sorts of impressive results, we tend to agree with the authors of this paper in their rhetorically ambitious title “Diagnosing periprosthetic joint infection: has the era of the biomarker arrived?”, and perhaps indeed they are correct. The era of biomarkers may well have arrived.

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