

# ROUNDUP<sup>360</sup>

## Hip & Pelvis

**X-ref** For other Roundups in this issue that cross-reference with Hip & Pelvis see: *Knee Roundups 2 & 5; Hip Roundup 3; Research Roundup 4.*

### Hip arthroscopy then arthroplasty?

■ As greater numbers are being diagnosed with femoroacetabular impingement, more patients are undergoing hip arthroscopy. Despite its increasing popularity, the results are far from clear. Patients are undergoing bone removal and labral repairs. When successful this is clearly positive, but what about when it is time for an arthroplasty? Is there an increased risk of infection? Does the hip arthroscopy affect the long- and short-term outcomes of the arthroplasty? The honest truth is, we don't know. The team from **Chicago, Illinois (USA)** set out to establish if indeed there is an effect on the outcomes of the second procedure.<sup>1</sup> Although a small series, the authors were able to report on 42 patients who underwent subsequent hip arthroplasty following a hip arthroscopy, and matched them 2:1 by age, sex and BMI to primary total hips. Outcomes were assessed with the Harris hip score (HHS), complication rates and revision rates. Bearing in mind that this is a small study and so is likely to be significantly underpowered, it is the first to compare complication rates and revisions, and found them to be similar to primary total hip arthroplasty (THA) patients. Additionally, HHS improved in all patients, regardless of prior surgery. Thus, hip arthroscopy does not compromise subsequent THA, and patients should still be

considered for THA after previous hip arthroscopy.

### Another outcome score? X-ref

■ There have been myriad outcome scores for total hip arthroplasty (THA), with many used extensively. These include the hip and osteoarthritis outcome score (HOOS), Harris hip score (HHS), Oxford hip score (OHS), lower extremity function scale (LEFS), forgotten joint score – hip (FJS - hip), musculoskeletal outcomes data evaluation and management systems (MODEMS) hip score, Merle d'Aubigné and Postel score, Iowa hip score, Charnley hip score, and the American Academy of Orthopaedic Surgeons' hip score. While these scores all have certain benefits and pitfalls, administering these outcome tests may result in incomplete forms. Some were not designed for what they are measuring (the Harris hip score, for example), many have not been validated and a few are inconsistent, suffer from floor and ceiling effects and many are not as responsive or reliable as one might expect. One thing, however, that all these scores have in common is that they are time-consuming to administer. Researchers in **New York, New York (USA)** have set out to construct and validate two short-form outcome scores.<sup>2</sup> They used a two-step study design and pre-operatively administered the HOOS in its entirety to a cohort of 2371 patients. The study team then underwent a formal process of item reduction analysis using semi-structured interviews in 30 patients, removing those items that did not seem relevant based on the qualitative research. The long list of 30 items was then subjected

to Rasch modeling, and the most pertinent six items retained to form the HOOS joint arthroplasty. The authors tested internal consistency, responsiveness and floor and ceiling effects, in addition to validity against other established hip scores. This study validates the shortest outcome score to date using only six questions and may become the standard of patient-reported outcome testing for THA in the future, providing a validated, rapid assessment of outcomes following joint arthroplasty for hip osteoarthritis.

### Cement-in-cement revision in the hip

■ Revising a cemented stem can be one of the most challenging aspects of revision hip arthroplasty. The advent of a cement-in-cement technique with the insertion of a smaller, shorter stem into the old cement mantle has already been reported in the literature with considerable success. However, this relies on a complete femoral canal and stable cement mantle. If a small-sized stem is already *in situ* and there is no smaller stem available, then the only alternative is to remove the cement mantle in the traditional way. The authors of this paper from **Edinburgh (UK)** are the first to publish the 'in-cement' revision technique.<sup>3</sup> This technique involves the introduction of a stem of the same size as the original implant into the original cement mantle, without additional cement or downsizing. Potential benefits of this technique include a better view of the acetabulum, ability to use the same-sized stem with the same offset and neck length, and it is quicker! The paper

reports 23 patients with a mean age of 65 years. Indications for revision were recurrent dislocation, aseptic loosening and infection. Mean follow-up was 67 months (12 to 128). The overall survivorship was 91.3%, with none of the patients requiring further revision for stem loosening or mechanical failure, though two patients required further revision for infection. The authors outline three key aspects to success: assessment of the cement mantle for stability and version once the old stem is removed; protection of the cement mantle while revising the acetabular component with a damp swab in the canal; and finally the re-insertion of the same-sized stem, without a centraliser. Clearly this is a small series of patients and, as the authors suggest, it warrants further investigation in a larger series with additional outcome measures, in particular radiographic outcomes. Although obviously only suitable in patients where an identical stem can be obtained, this very simple technique potentially avoids the added burden of having to remove the cement mantle in patients who may not otherwise be eligible for a cement-in-cement revision. Detractors would argue that this is really only an exchange, and that patients suitable for this procedure really didn't need a femoral revision in the first place.

### The determinants of poor outcomes in metallosis revision X-ref

■ Much focus and innumerable journal pages have been devoted to metal-on-metal (MoM) bearings, both their advantages and

disadvantages. A particular focus and cause for concern has been the revision of MoM total hip arthroplasty (THA), with poor outcomes predicted in patients who have a pseudotumour. Although the risk factors for MoM failure have been well explored over the last few years, the determinants of outcome following revision are still not completely clear. This current study from **Boston, Massachusetts (USA)** aimed to identify the potential pre-operative risk factors associated with revision outcomes (either good or bad) in patients who underwent revision surgery for a failed MoM THA due to a symptomatic pseudotumour.<sup>4</sup> A total of 102 consecutive large diameter head MoM hip arthroplasties in 97 patients underwent revision surgery for pseudotumour. In common with other series, there were significant numbers of poor outcomes. The primary revision procedure resulted in a 14% complication rate and a 7% re-revision rate at 30 months' follow-up. All of the chief predictors of a poor outcome in this series were radiographic. The authors report that signs of pre-revision radiographic loosening, MRI findings of solid lesions associated with an abductor deficiency, and intra-operative findings of adverse tissue reactions were correlated with post-revision complications. However, patient and surgery factors such as age, sex, pre-revision surgery metal ion levels, type of femoral head used at revision, and femoral head size were not significantly correlated with complications. In what is a very helpful study of clinical importance to the orthopaedic surgeon considering revising a MoM hip arthroplasty for pseudotumour, the authors have identified simple, visible radiographic features that are indicative of a poor outcome. This is useful in pre-operative discussions with the patient, particularly when it comes to prognosis. It also further highlights the importance of performing an early revision in patients with symptomatic pseudotumours

following MoM hip arthroplasty, before extensive soft-tissue destruction has occurred.

### Infection in arthroplasty

#### X-ref

■ Periprosthetic joint infection (PJI) is thankfully a relatively infrequent but devastating complication of total joint arthroplasty. Prevention here is clearly better than cure, and this is illustrated in the large volume of literature published on the potential PJI risk factors. As the authors of this meta-analysis point out, however, the conclusions of these studies can be varied and at times contradictory. A review team from **Hebei (China)** undertook a meta-analysis with the aim of identifying risk factors including patient characteristics, surgical-related factors and comorbid conditions in order to quantify these risks in patients undergoing total joint arthroplasty (TJA).<sup>5</sup> The authors identified 24 suitable studies for inclusion in their meta-analysis, with a reported rate of PJI of between 0.51% and 3.35%. The review team identified a number of risk factors for TJI including male sex, obesity, alcohol abuse, higher American Society of Anesthesiologists (ASA) score, operative time, drain usage, diabetes mellitus, urinary tract infection and rheumatoid arthritis. The most significant risk factor was comorbidity, with patients with an ASA > 2 most likely to present with infection. Following subgroup analysis, although male gender was not a significant factor in total hip arthroplasty, it was significant in total knee arthroplasty. Smoking, steroid use, bilateral surgery, blood transfusion, cementation or hypertension were not proven to be risk factors, despite sporadic reports in the literature to suggest that they might be, as they did not reach statistical significance. The authors concluded from their statistical analysis that there was no evidence to suggest a publication bias in the papers that were included. The most common and increasing challenges are patients listed for surgery who are obese (BMI > 30), and an increased PJI incidence

in this patient group is undoubtedly multifactorial, including longer operative time, the presence of other comorbidities, and wound complications such as haematoma formation and wound dehiscence. While not underestimating the difficulties that obese patients have in losing weight, particularly when they find it difficult to exercise, it is important to explain the potential benefits pre-operatively in reducing their risk for PJI, as well as the other health benefits of losing weight. Two surgically-modifiable risk factors were identified including operative time and the use of a drain which was protective of infection (likely due to the reduced incidence of haematoma). Although the authors are to be commended on an up-to-date meta-analysis, their work again emphasises the enormous heterogeneity of the studies analysed. While the risk factors they identified come as no surprise, there is a real need for a large, high-quality study to accurately quantify these risk factors so that robust preventative management can be instigated, reducing the risk of PJI for patients.

### Tantalum acetabulum

■ The vogue for tantalum acetabular and femoral components is mostly due to the ability to form a firm bond with the bone and avoid the issues of delamination or failure, as the bone is able to fully osseointegrate with the prosthesis. The ability to augment bony defects with a biocompatible metal has dramatically changed the management of (amongst other things) acetabular defects. Despite dramatic uptake within the orthopaedic community, there isn't really much evidence to support this approach. The porous coated tantalum acetabular shells are the focus of this paper from **Vancouver, British Columbia (Canada)**. The authors report the outcomes of 46 patients, all recruited with a failed acetabular component and Paprosky grade II or III bone defect addressed with a hemispherical, tantalum acetabular



component, supplementary screws and a cemented polyethylene liner.<sup>6</sup> The authors report a minimum of ten years' follow-up and they primarily focused on acetabular component survival, although clinical scores are also reported. The authors demonstrated excellent clinical results with the use of porous tantalum uncemented acetabular reconstruction in revision total hip arthroplasty, with an acetabular survival rate of 96% and overall joint survival of 92%. Clinical scores were also good with a mean Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) 92.6 pain score.

### Silver-coated acetabular components

■ We are always interested in preventative methods for infection. As antimicrobials become more and more ineffective, the use of surface coatings to reduce infection is becoming more of a 'go to' position. An interesting and unique series of just 20 patients is reported by investigators in **Saga (Japan)**. All the patients underwent implantation of an acetabular component thermal-sprayed with a silver oxide-containing hydroxyapatite-coated acetabular and femoral component.<sup>7</sup> The authors report no adverse reactions attributed to the silver coating at one year after surgery. Silver is helpful in that it has a strongly cytotoxic effect and is active against bacterium. There are some concerns about toxicity; it is known to cause 'silver skin' at higher concentrations and can cause DNA damage in excessively

high amounts. We are delighted to see this paper describing an effort to prevent and minimise the peri-operative risk of infection. These implants appear to be safe without compromising patient function and may become increasingly relevant. The key to establishing their safety is to carefully introduce new technology backed up by appropriate animal safety studies. Orthopaedic surgeons are all too familiar with the ongoing issues associated with metal-on-metal reactions and accumulated metal debris. Silver has a long track record of safe use in humans (in applications as diverse as the silver Negus tracheostomy tubes), however, clearly any new metallurgy involved in an articulating surface should be evacuated very carefully, given recent history.

### High rates of failure with modular neck designs

■ Increased modularity adds the attractive option of a more

‘anatomical’ fit for many implants, with the advantage of increased restoration of normal anatomy and therefore function. However, there are some potential disadvantages to this approach and, with the phenomenon of trunnionosis already a problem, adding further junctional tapers (often with oblique loading) has the potential to worsen the situation. Some early clinical reports have suggested high failure rates from these implants. Researchers from **Houston, Texas (USA)** have set out to establish the potential problems with these systems, and have gone back to review their own modular total hip arthroplasty (THA) experience with 73 arthroplasties.<sup>8</sup> The headline figures are that at a mean follow-up of 4.2 years after THA performed with a specific modular-neck femoral stem (Rejuvenate; Stryker, Kalamazoo, Michigan), the authors demonstrated an 86% clinical failure rate with 78% of the stems having

undergone revision. A truly shocking outcome. The authors assign this to a corrosion-related failure rate. It is clear that continued close monitoring of this stem design is prudent and early revision after identification of stem failure is recommended. It does beg the question: how in the modern era can implants that have such a high failure rate be permitted for public release?

### REFERENCES

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## Knee

**X-ref** For other Roundups in this issue that cross-reference with *Knee* see: [Hip & Pelvis Roundup 2](#); [Children’s orthopaedics Roundups 1 & 7](#); [Research Roundups 1, 2 & 5](#).

### Closure with barbed sutures?

■ There is plenty of evidence from primary studies through to randomised controlled trials and meta-analyses that suture closure reduces the infection rate following orthopaedic surgery. Anecdotally, patients prefer the look of a hand-sewn closure to the rather ugly scars left by clips. Surgeons, however, quite like the convenience and consistency provided by clips, and as such they have continued to be popular. Barbed sutures offer the neat scar and subcutaneous position of a suture, but as they do not rely on knots these sutures also provide the convenience of clips. They are increasingly being used in total joint arthroplasty, but in contrast

to traditional sutures and clips, few studies have been conducted on their use, and in particular their infection rates. Surgeons in **New York, New York (USA)** have been using barbed sutures for closure in their unicompartmental knee arthroplasties (UKA) and report the outcomes of 839 unicompartmental knees closed with either the Quill barbed suture (Surgical Specialties Corporation; Wyomissing, Pennsylvania), or traditional closure consisting of a mixture of 2/0 monocryl and clips.<sup>1</sup> The study cohort consisted of 333 Quill closures and 506 conventional closures. Outcome measures included wound infections. Slightly surprisingly, all eight wound infections occurred in the Quill cohort. Given the low event rate and small numbers, it is possible to ignore these findings. Nonetheless, this is the best evidence there is at present, and it indicates significantly higher

superficial infection rates with the Quill suture. Not unreasonably, the authors recommend against the use of barbed sutures in the subcuticular closure of UKAs.

### Minimally invasive knee arthroplasty at five years

■ Surgeons and patients alike love the thought of minimally invasive or keyhole surgery, and with less soft-tissue disruption, reduced scarring and soft-tissue pain, from a surgical perspective the results seem likely to be preferable. We have never been huge fans here at 360, as the results of arthroplasty are to a certain extent determined by the accuracy of implantation, meticulous attention to surgical technique and the delicate task of getting the thing in straight, all of which are more difficult with a ‘mini’ approach. This, combined with the general lack of good-quality evidence to support the use of minimally invasive hip

or knee arthroplasty, has caused us to stay away. However, we were delighted to see the five-year results of a study from **Rotterdam (The Netherlands)**, designed to evaluate the benefit (or otherwise) of minimally invasive midvastus and conventional total knee arthroplasty (TKA).<sup>2</sup> The authors report their randomised controlled trial of 100 TKAs (97 patients) randomised to either midvastus or conventional surgery. The primary outcome measure was the clinical patient-reported outcome measure (PROM), with the knee injury and osteoarthritis outcome score (KOOS), Oxford knee score (OKS), Knee Society score (KSS) and short form (SF-12) reported. In addition, the usual gamut of secondary outcome measures including and skin incision length were reported. This long-term five-year study essentially demonstrated no clinical outcome differences between the two