

# ROUNDUP360

## Hip & Pelvis

**X-ref** For other Roundups in this issue that cross-reference with *Hip & Pelvis* see: *Knee Roundup 5* and *8*; *Trauma Roundup 4*; *Research Roundups 3, 4, 6, and 7*.

### Revision risks for femoroacetabular impingement surgery

■ The bread and butter of femoroacetabular impingement research is studies with short-term follow-up reporting outcomes after arthroscopic treatment of femoroacetabular impingement. This particular study from the home of femoroacetabular impingement surgery in **Bern (Switzerland)**<sup>1</sup> set out to establish the clinical and radiographic outcomes, along with survival, at a mean seven-year follow-up, offering a much needed longer term view. The series reports the outcomes of 52 hips (50 patients, 89% female). Of these, a total of 39 hips underwent head-neck offset correction, four hips had acetabular rim trimming and nine hips had both interventions. In common with most prospective series, four hips had the labrum resected, and in 16 hips, the labrum was excised. At a mean follow-up of 7+/- 1 years, two patients were lost in entirety to follow-up and 16 patients did not return for clinical examination but did complete a postal questionnaire. Of the 52 hips in the study, two (4%) underwent a THA, at seven and nine years, respectively. Eighty-seven percent of patients (45/52) reported favourable clinical outcomes (Merle d'Aubigné 15–18 points) although there was progression of arthritic changes in six hips and heterotopic ossification in six hips. Although

the conversion rate to THA looks favourable, a further nine hips (17%) underwent revision surgery for either offset correction or rim trimming, and, in some patients, both. The mean survivorship at seven years was therefore just 81%. There were a number of univariate factors that led to revision surgery, including pincer impingement and pistol grip deformity. This very honest study from a world-leading group highlights the importance of patient selection, adequate debridement of a pincer and also restoration of a normal head-neck offset in order for the technique to be successful. Very few studies have been published to date following hip arthroscopy in patients with more than five years of follow-up. Hopefully, the results published in this study will encourage more surgeons to publish their own data with mid- to long-term follow-up, as the data at present are lacking, and given the aims of hip preservation surgery it only really becomes entirely justifiable if the long-term results at ten to 15 years are favourable.

### Cementless stems in the older patient

■ In the current climate there is strong pressure on many arthroplasty surgeons to implant cemented stems in the older patient cohort, the rationale being (at least in part) that this group has a high likelihood of osteopaenia/osteoporosis, leading to increased risk of fracture or poor osseointegration resulting in early failure in cementless stems. This paper from **Maryland** and **Kentucky (USA)**<sup>2</sup> specifically addresses this issue, comparing both mid-term

revision rates and clinical outcomes between patients over 80 years and a matched group of younger patients (mean age 59 years). Although the data presented here are limited by their retrospective study design, it is somewhat obscure in the manuscript that these are neither consecutive patients or a predefined cohort specifically selected. However, the results do support the authors' assertion that both subjective patient outcome data and complication/revision rates are comparable between younger and older groups. This study definitely lends some support to those surgeons favouring un cemented stems in older patients, and, given the concerns over the potential side effects of cement pressurisation in the femoral canal, it is heartening to read a comparative series with no higher complication rates. The selection of femoral stems in the older patient cohort is one of great debate, not least due to the range of functional levels seen in what is becoming an increasingly heterogeneous group pre-operatively.

### Superobesity and total hips

■ Opinion remains divided regarding the implications of obesity on cost, complications and outcomes following total hip replacement. With the literature as divided as surgeons are on the relative risks and implications of the 'superobese', it is difficult to know exactly where the truth lies. We were heartened to read this simple but comprehensive analysis from **Philadelphia, Pennsylvania (USA)**<sup>3</sup> of a retrospective of fairly sizeable numbers which is able to stratify patients into different

grades of obesity. The statistical analysis compares 377 000 patients with 'normal' BMI against 9900 who were morbidly obese and 800 'superobese' patients (BMI > 50) in one of the first analyses to be able to account in significant numbers for the superobese. The authors conclude that in those patients with a BMI over 40, there is an increased risk of infection, and in the number of complications. Interestingly, the excess complication burden includes both surgical *and* medical complications and is especially pronounced in those with BMI > 50. The data here clearly come down in support of a school of thought that increased BMI is associated with higher rates of complication and re-admission. The difficulty with papers like this is that healthcare insurers and providers will often use them as an excuse to deny surgery to obese patients. However, the health economic decision is obviously much more complex than this. What this paper does clearly establish, given the large numbers, is that there is an excess in complications significant enough to warrant a mention during the pre-operative counselling process.

### Can the hip ever be forgotten in young arthroplasty patients?

■ This is a great study from **St Louis, Missouri (USA)**<sup>4</sup> examining expectations in hip arthroplasty in younger patients. This study examines whether we ought to make our expectations more realistic in terms of what we tell younger patients (18 to 60 years) to expect, symptomatically and functionally,

following total hip arthroplasty surgery. Traditionally, the perceived expectation is to be able to achieve the "forgotten hip". It is a retrospective cohort study which initially identified 1336 patients undergoing either total hip arthroplasty or hip resurfacing. After patient dropout/refusal to comply, or failure to meet exclusion criteria, 886 remained in the final dataset. A computer system was then used, utilising telephone numbers randomly generated, to identify and contact a group of control patients matched for age, sex, and various other criteria. In the control group, the researchers found a surprisingly high incidence of limp (15%), stiffness (11%), pain (8%), or hip noise during the previous 30 days. Although these issues are less common than those found in the joint replacement surgery group, this does highlight the fact that even a "normal" hip is not always a symptom-free joint. Given the results of this study, it is unrealistic to suggest to patients who have both experienced significant hip pathology and then undergone a major surgical intervention that the end results of a "forgotten hip" can be in any way taken for granted.

#### Length of stay and surgical timing

■ In such financially austere times, all factors potentially saving the healthcare dollar are of great potential interest – and specifically, the length of hospital stay following elective orthopaedic surgery might seem an easy target, and has been the focus of a generation of efficiency papers. This well constructed paper from **New York, New York (USA)**<sup>5</sup> has a clearly defined objective with appropriate analysis. The authors aimed to compare length of stay (LoS) following hip arthroplasty between patients having surgery on Monday/Tuesday and those on Thursday/Friday. A further analysis compared LoS in patients whose operations started after 2 pm with those commencing earlier. All 580 patients were operated by three surgeons and adjustment

is made for patient factors, surgical approach and comorbidities. Perhaps the 'start time' affecting LoS result might seem obvious, however, the outcomes regarding choice of week day were more eye-opening. The odds ratio of extended LoS (> 75<sup>th</sup> percentile LoS) is 3.27 for patients undergoing surgery later in the week (mean LoS 0.4 days longer for end of week patients). The authors of this study have not attempted to interpret the causes of this disparity, and it is certainly more than likely that the differences in the availability of the various allied health professionals at weekends, as compared with midweek, may reflect the underlying differences. What is perhaps unclear, however, is whether hospitals can be persuaded that investment in the resources required to address this would be cost effective.

#### Risk stratification following metal-on-metal hip replacements

■ While it's true that fewer metal-on-metal (MOM) implants are being implanted, there are certainly a large number of patients with a potential 'ticking time bomb' in their hips and we will be following these up for many years to come. A survey at the recent American Association of Hip and Knee Surgeons meeting concluded that patients with MOM implants must be followed up and counselled. This article from **Boston, Massachusetts (USA)**<sup>6</sup> provides an American take on risk stratification parameters to allow providers to counsel their patients. Whilst a lot of work has been undertaken on this subject on the other side of the pond, there are few agreed protocols. This is a clear take on a risk stratification approach to following up patients with a MOM hip implant. The use of this suggested protocol would result in patients classified as high risk having a likelihood for needing revision of 5.8-fold increase relative to moderate risk patients, and a 21.8-fold increase in revision relative to low risk patients. This paper is essential reading for anyone formulating their own follow

up protocols and suggests a sensible approach to a very tricky problem.

#### Large head metal-on-polyethylene hips not subject to excessive wear

■ As the hard-on-hard bearing surfaces became more popular in the early 2010s in total hip arthroplasty, there was a move to maximise femoral head size. The advantages of stability with increased jump distance, femoral neck:head ratio were combined with a higher radius of curvature making thick film lubrication more likely. Whilst only the stability components of this were applicable to hard-on-soft bearings, the introduction of cross-linked polyethylene has made the larger femoral head size a possibility, especially in ceramic-on-polyethylene. Like many iterative changes, however, there is little to no evidence to support the move from 28 mm heads to the 36 mm, and larger, heads. This study from **Adelaide (Australia)**<sup>7</sup> evaluates 36 mm and 28 mm femoral heads in metal-on-polyethylene articulations in a head-to-head randomised controlled trial. The authors recruited 56 patients, all undergoing total hip arthroplasty, and undertook radio stereometric analysis (RSA) to establish the wear rates. One would expect the smaller 28 mm heads to have an apparently larger wear rate on RSA, as it measures component migration as a surrogate for wear, which in practice equates to penetrative, not volumetric wear. This study followed the patients to between one and three years post-operatively, taking advantage of the accuracy of RSA to draw early conclusions. The results of this study suggest that to all intents and purposes there were no differences in the wear rates (0.00 mm/yr for 36 mm metal heads and 0.01 mm/yr for 28 mm heads). Nonetheless, papers like this always need to be taken in context. The negligible wear rates reported are likely to encourage surgeons to implant 36 mm heads without concern for increased wear. However, wear is a multifaceted beast and the volumetric wear



is not really measured here as the migration in both groups is too small for it to be inferred. We would be interested to see a longer follow-up of this group when enough time has passed to see some migration occur.

#### Are ceramic heads cost-effective in hip arthroplasty?

■ Ceramic heads are increasing in popularity of use across all indications for primary hip arthroplasty. The elimination of trunnionosis and the appeal of a smoother wettable surface potentially giving rise to lower rates of adhesive and abrasive wear makes for an attractive option. That said, they are much more expensive and therefore may not turn out to be cost-effective. These authors from **Charlotte, North Carolina (USA)**<sup>8</sup> sought to determine the optimal age to use ceramic heads based on a health economic Markov model. Based on the published literature for failure rates, the authors constructed their Markov model to assess the cost-effectiveness of ceramic heads at various price differentials. If there is a small differential in price (\$325) between ceramic-on-polyethylene (COP) bearings and metal-on-polyethylene (MOP) bearings, then COP should be used on patients less than 85 years old. If there is a moderate differential in price (\$600), then COP should be used in patients less than 65 years old. If the price differential is large (> \$1003), then COP should not be used. Thus, all efforts should be made to negotiate to lower the cost of ceramic heads, so that they can be used cost-effectively in more patients.

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# Knee

**X-ref** For other Roundups in this issue that cross-reference with *Knee* see: **Trauma Roundup 2; Oncology Roundup 8; Research Roundups 2, 3, 4, 6 and 7.**

## The rising burden of knee arthroplasty

■ The increasing burden of osteoarthritis in an ageing population is well known, and despite a plethora of doom-mongering predictive papers a few years ago, there has been little in the recent literature to confirm if the rising tide is indeed, as they claim, rising! An epidemiology team in **Melbourne (Australia)**<sup>1</sup> have published one of the first studies to accurately quantify this increase. The major strength of this paper is in quite how comprehensive the dataset is, the investigators having reviewed data from Australia, Denmark, Finland, Norway and Sweden. They used the long-standing and established population registries in these countries to compare the lifetime risk of primary total knee arthroplasty (TKA) for osteoarthritis (OA) in five countries, and to describe a change in lifetime risk over a ten-year period. The incidence of TKAs performed annually in patients aged 60 years or younger increased over the study period in all countries by up to 5.1%. The proportion of TKAs performed for those patients aged 80 years or older decreased over the ten-year period in all countries except Finland. TKA was most

frequently performed for the 60 to 69 years age group at the end of the study period in 2013. The lifetime risk varied across all countries included in the study from 5.84% (Denmark) to 19.2% (Finland). The considerable data presented in this paper comprehensively assess the increasing burden of TKA in a range of developed countries, providing an important and sanitising review for all those responsible for planning healthcare budgets. In the face of tightening financial controls, decisions have to be made about this increasing demand. Difficult decisions are clearly looming and these will need to be made at national or health-care funder level – in the majority of countries it seems likely that this increase in demand is unaffordable.

## HIV in knee replacement

■ Early diagnosis and treatment of HIV has resulted in life expectancies approaching those of the general population. Such patients are just as susceptible to degenerative joint diseases as those without HIV, in addition to the excess risk of osteonecrosis. Concerns have previously been raised about the higher risk of peri-operative complications such as myocardial infarction, acute renal failure, wound infection and lower implant survivorship in the HIV population, however, there is little data to support this supposition. With considerable disagreement in the current literature, the authors

of this study aim to review clinical outcomes in patients with HIV undergoing total knee arthroplasty (TKA), implant survivorship and complications. Despite this increasing disease burden, there are few studies on which to form an evidence base. We were delighted to see this retrospective review from **South Orange, New Jersey (USA)**<sup>2</sup> of 45 patients, all with HIV, reporting the outcomes of 50 TKAs. The paper reports the outcomes to a mean follow-up of six years (4 to 10) with a comparison-matched cohort of 135 patients without HIV. These also underwent a TKA performed by the same surgeons. Importantly, patients with HIV who also had haemophilia were excluded from this study. There were no differences in clinical outcomes at the final follow-up between the two groups, and no differences in survivorship. There was a single revision in the HIV group at two years for pain and instability and a single case of aseptic loosening in the matched cohort at three years. There were no revisions for infection in either group and post-operative complications were also comparable in both groups. With the improved medical management of HIV and better survival rates, it is increasingly likely that these patients will present with end-stage degenerative joint disease, requiring total joint arthroplasty. Despite its weaknesses, this is the largest comparative study to date reviewing this

patient population, for which the authors should be commended. The message from this study is clear: as with any comorbidity, pre-operative optimisation is vital to a successful outcome. Close liaison with the medical team pre-operatively is essential when contemplating performing a TKA in a patient with HIV. Do check with your medical colleagues that they are happy to provide support peri-operatively. However, when appropriately performed in a multidisciplinary setting, the results are comparable with those of HIV-negative patients.

## Frame-assisted fusion: the ultimate bailout?

■ The almost universal success of large joint arthroplasty makes the failures somewhat harder to bear. However careful and competent the surgeon, patients will go on to develop deep infections, and on occasions these will not be treatable with the traditional washout or revision arthroplasty approach. When other options have failed, knee arthrodesis is often the 'go to' salvage procedure. It allows the surgeon to address patients with extensive bone loss and recurring knee infections without loss of the limb. The aim of such a procedure is to gain a stable, pain-free lower limb, and with obliteration of the joint there is a low risk of further infection - an attractive alternative to an above-knee amputation. Arthrodesis can be performed in a