

ROUNDUP³⁶⁰

Hip & Pelvis

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

Enhanced recovery works

■ Enhanced recovery programmes invest in higher quality care including a coordinated pre-, peri- and post-operative integrated care regime. The proponents argue that the increased costs associated with higher intensity anaesthetic and post-operative care packages are outweighed by a higher quality outcome and lower costs associated with hospital stay. The difficulty has always been in yielding sufficient benefit in terms of hospital length of stay without increasing the costs astronomically. Surgeons in [Delft \(The Netherlands\)](#) previously developed their own take on rapid recovery protocols. Four years on, they have looked back to review the results of 1180 primary unselected total hip replacements in a retrospective cohort series during the introduction of their rapid recovery pathway. All patients who underwent a primary total hip replacement between July 2008 and June 2012 were included, some of whom benefitted from the rapid recovery pathway. The mean length of stay dropped from 4.6 days to 2.9 days after the introduction of the rapid recovery pathway and there were no statistically significant differences between complication, re-admission or re-operation rates between the groups.¹ The loss of one and a half days of post-operative stay for a large patient cohort has the

potential to offer profound benefits to patients and clinicians. If achieved without incurring large additional costs (such as outreach nurses), it appears from the data presented that real benefits can be seen in resource utilisation without additional complications.

Acetabular placement: sharp shooter or shotgun approach?

■ The orientation of acetabular placement has assumed greater importance in contemporary orthopaedics as a result of the metal-on-metal debacle. Researchers have poured many hours into computer modelling and experimenting on the wear patch, cover, version and head size, and the effects all these have had on the risk of ALVAL and excessive wear. Consequently, the attention of the arthroplasty surgeon has been turned to his post-operative radiographs and acetabular alignment, something that can be difficult to judge intra-operatively. Surgeons from [Washington \(USA\)](#), being gluttons for punishment, turned their attention to their own acetabular positions as judged on the post-operative hip AP radiograph. Using Martell Hip Analysis software, a complete series of consecutive primary arthroplasties was undertaken at their institution over a five-year period. 'Safe windows' were defined for both THR (abduction angle, 30° to 55° and anteversion, 5° to 35°) and resurfacing (abduction angle, 30° to 50° and anteversion, 5° to 25°). Analysis was undertaken over a series of 1549 consecutive patients and

both surgeon and patient-related factors were analysed for the risk of acetabular malposition. In 93% of patients (n = 1435) there was an acceptable abduction inclination target, 95% of patients had an acceptable anteversion angle (n = 1472), and a slightly less impressive 88% fulfilled both targets (n = 1363). There were only 263 resurfacing arthroplasty patients, of whom 89% were acceptably abducted (n = 233) and 94% had acceptable anteversion angles, leaving 220 (84%) with an acceptable component position. Previously accepted 'safe zones' for acetabular placement of abduction (30° to 45°) and anteversion (5° to 25°) were far less commonly met in both THR (43% abduction target; 86% anteversion target; 38% both targets) and resurfacing (69% met the abduction target; 94% anteversion target; 65% both targets). The factors associated with malposition were surgeon volume (low-volume surgeons were 2.16 times more likely to misalign components) and body mass index, with odds of misalignment increased by ≥ 0.2 for every 5 kg/m² increase in BMI.² The authors were unable to find any link between minimally invasive approaches, diagnosis, years of surgical experience, femoral head size, age of the patient and misalignment of the component. Given the importance of acetabular component alignment, we were surprised to find such high rates of malposition. However, there are a number of possible explanations for this. We wonder here at 360

if acetabular component alignment would be amenable (like DHS position reported previously in these pages) to the Hawthorne effect.

Exercise better than rest in osteoarthritis patients

■ The thorny subject of exercise and osteoarthritis has been tackled by a review team from [Keele \(UK\)](#). Patients are often unimpressed with advice from surgeons to lose weight and exercise more often. However, this is a widespread approach in the western world for patients with early osteoarthritis. Here, the authors ask: is this a reasonable approach? This extremely thorough systematic review included nine of the biggest electronic databases, including all randomised studies from inception of the databases that evaluate the utility of exercise in treatment of patients with diagnosis of osteoarthritis. The authors identified 60 randomised controlled trials (44 concerning knees, two with hips, and 14 with mixed diagnoses). The studies evaluated 12 different exercise regimes with over 8000 randomised patients included in the analysis. The study design included sequential analysis (to investigate the reliability of available evidence) and a Bayesian model to combine both direct and indirect evidence on treatment efficacy. The sequential analysis demonstrated that, by 2002, there was sufficient evidence to demonstrate benefit of exercise interventions over control and that there was no need at that point for any further studies. The meta-analysis concluded

that exercise interventions, including strengthening, flexibility plus strengthening, flexibility plus strengthening plus aerobic, aquatic strengthening, and aquatic strengthening plus flexibility were significantly better than control when pain is taken as an end point. In terms of functional outcomes, the use of strengthening, flexibility, and aerobic exercise was significantly more effective than no exercise for improving limitation in function.³ The authors have conclusively demonstrated that structured exercise programmes have a significant benefit for patients with osteoarthritis of the lower limb when compared with no-exercise controls. The patients derive benefit in terms of both analgesic effects and improvement in limitation of function. Given the weight of evidence currently available, it is unlikely that further trials will overturn this evidence and the authors recommend a cessation of randomised controlled trials in this area.

Birmingham hip resurfacing not immune from pseudotumour

■ There is a spectrum of concerning side effects potentially associated with metal-on-metal articulations. The Birmingham hip resurfacing (BHR), of all the resurfacing arthroplasties, has been seen to have the best outcomes and although concerns have been raised surrounding its outcomes (which are worse than THR in every developed hip registry), the prosthesis has escaped relatively unscathed in the literature and is still sold. Researchers from **Groningen (The Netherlands)** have investigated the incidence of pseudotumour formation in their cohort of patients who had undergone BHR. The researchers performed a single-centre cross-sectional prospective cohort study of all patients who underwent a BHR between 2005 and 2010 to investigate the scale of the potential problem. Patients were recalled for clinical review including serum metal ion levels, clinical outcome scores, radiographs and a

CT scan. The study cohort consisted of 129 patients with 149 BHRs, with an impressive 96% follow-up. There were 12 hips (11 patients) which had undergone revision arthroplasty at the time of final follow-up. Survival analysis yielded an implant survival rate of 87.5% at five years. The CT scans were particularly worrying, with a pseudotumour present in 39 patients (40 hips, 28%). In the cohort of patients with pseudotumours, 11 BHRs (28%) were symptomatic either with groin pain, a mass, or paraesthesia. These symptomatic pseudotumours were significantly larger (53.3 cm³ versus 16.3 cm³) and the investigators found a serum cobalt level of > 85 nmol/L was predictive of pseudotumour formation (OR = 4.9). By final follow-up, only seven patients, however, (eight hips; 5.6%) had undergone revision surgery for pseudotumour formation.⁴ The findings of such high rates of symptomatic and asymptomatic pseudotumours is worrying, on whichever side of the metal-on-metal fence you sit. Orthopaedic surgery may be facing the largest early revision burden (not to mention loss of public and patient confidence) in its history.

HIV and arthroplasty

■ HIV is a disease for which treatment has recently been revolutionised. Patients are more commonly living in excess of 20 years following diagnosis, with appropriate medical intervention, and existing patients are starting to age such that joint replacement is becoming required, and not just for the sequelae of HIV. As the incidence of primary joint replacement in HIV-positive patients has been increasing, the lack of high quality evidence surrounding joint replacement has been brought into

focus. Researchers in **San Francisco (USA)** have investigated the year-on-year incidence of primary replacement and the effect of HIV as an independent risk factor for complications following surgery. The research team used the US national inpatient sample between 2000 and 2008 to identify patients who underwent primary joint replacement and those with HIV. Comorbidities and complications were identified through the use of ICD-9 codes and the data were analysed using both univariate and multivariate logistic regression

analysis. During the study period, across the USA, there were 5 681 024 admissions for primary total hip and knee replacement. Of that sample, 0.14% were HIV positive (n = 8229). Demographically, the HIV group were more likely to be younger, male, and have histories including osteonecrosis, liver disease, drug use, and coagulopathy. There was a statistically significant increase in rates of arthroplasty in the HIV subgroup throughout the period of the study. Although this study by its very nature is limited to coding information, the investigators were able to glean that HIV-positive patients were more likely to develop acute renal failure (1.3% versus 0.8%), wound infection (0.6% versus 0.3%), and require debridement for post-operative infection (0.2% versus 0.1%). However, there was no difference in overall complication rate (8.3% versus 7.8%) and a lower incidence of myocardial infarction. HIV was not found to be an independent risk factor for complications in total hip replacement (OR 1.18; 95% CI 0.95 to 1.47) or total knee replacement (OR 0.78; 95% CI 0.49 to 1.25).⁵ This may, however, reflect the interaction between competing risk factors such



as age and HIV infection. What is clear from this work is that although the overall complication rate is not significantly higher, the complication spectrum differs in those with and without HIV.

Location, location, location: labral tears revisited

■ Labral tears in the hip are most commonly associated with dysplastic hips and femoroacetabular impingement (FAI), however, the differences in location, aetiology and associated cartilage pathology are not well established. Researchers from **Osaka (Japan)** set out to establish the differences in the location and mode of labral tears between dysplastic hips and hips with FAI. They designed a retrospective study of 72 symptomatic hips who had previously presented with symptomatic labral tears and radiological evidence of either dysplasia or FAI on CT arthrography. The researchers investigated the relationship between location of labral tear (mode 1 – base of the labrum; mode 2 – body of the labrum) and the underlying aetiology of mildly dysplastic hips, severely dysplastic hips and FAI. The researchers noted that labral tears occur with different prevalences in the different zones. The ratio of mode 1:2 tears were significantly different with FAI (72%:28%) hips than dysplastic hips (25%:75%). The underlying hip pathology was also seen to be intimately linked to the mode of labral tear, with higher frequencies of cartilage damage in mode 1 than in mode 2 tears.⁶ These observations may explain to a certain extent some of the differences seen in the natural history and pathophysiology of FAI and dysplastic hips.

Are we really helping?: prophylactic surgery for FAI

■ Some surgeons in certain centres are now routinely offering prophylactic surgery for patients with asymptomatic FAI. There are a number of patients who have incidental findings of FAI. Certain schools of thought support treatment of these lesions to prevent further future joint

degeneration. Is this the ultimate in early intervention? Researchers in **New York (USA)** set out to establish if there is indeed any evidence for this fast emerging trend or if indeed, like other surgical fashions, it has no basis in scientific evidence. The surgical team designed a systematic review using indexed literature between 1965 and 2013. All comparative studies of patients with radiographic evidence of FAI undergoing prophylactic impingement surgery were included. Despite an initial screening search identifying 840 potential references, these were more closely reviewed and none of the references were found to match the eligibility criteria. The research team were unable to find a shred of evidence to support the practice of surgical intervention for asymptomatic FAI patients.⁷ The authors conclude that “current evidence does not support prophylactic surgery for asymptomatic FAI in the vast majority of cases”. We have to say, here at 360, that we tend to agree with them.

Ceramics and impaction grafting

■ A constant challenge in revision hip surgery is restoration of eroded

bone stock, and this problem can be particularly acute round the loose acetabulum. A particularly successful approach has been the development and widespread use of impaction grafting, where morcellised bone is impacted ‘vigorously’ into a contained defect. While known to be successful in the longer term, impaction grafting carries with it some drawbacks associated with the donor bone, infection, autogenicity, cost and availability of allograft. Researchers in **Bristol (UK)** started using BoneSave, a sintered biphasic material consisting of 80% tricalcium phosphate and 20% hydroxyapatite, in a 50:50 mix with femoral head allograft. They have updated their original study with mid-term (seven years) results of 43 patients undergoing impaction grafting of the acetabulum. Unusually, the surgical teams performed their impaction grafting and in the majority of cases (34) used an uncemented acetabular shell, which is thought by some to shield stress and reduce integration of cancellous graft. Patients were followed over a ten-year period using a combination of radiological and patient reported outcomes (self-reported satisfaction scale (SAPS),

Oxford hip score (OHS), and Short Form 12 (SF-12)). Survivorship was assessed using the Kaplan–Meier method and revision or re-operation analysed as separate end points. Remarkably, the authors managed to have a 0% loss to follow-up rate with a median follow-up of 80 months. At seven years, the survivorship of the acetabular component was 94% (95% CI: 99 to 78), with a single patient revised for aseptic loosening and one for deep infection.⁸ Radiologically, the graft material was seen to integrate in all three zones of the acetabulum in 23 out of 24 cases, and outcomes reported in the OHS (31 SD21), SF-12 (38 SD13) and SAPS (83 points) were comparable with other similar published series. Ceramic bone substitute:cancellous bone mix seems to be a good alternative to 100% bone chips for impaction grafting, reducing the demands on bone banks, costs and infection risk.

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