

ROUNDUP360

Hip & Pelvis

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Ten-years and half a million hips: what did we learn?

■ There is much to learn from large retrospective studies, particularly in relation to the direction of travel of practice. This is a well-conceived paper from **Middlesborough (United Kingdom)** that examines complication rates in over half a million (540 623) primary hip arthroplasties undertaken in the United Kingdom between 2005 and 2014.¹ Akin to many of these large epidemiology series, this is a retrospective registry-based study. It uses the British National Joint Registry and Hospital Episode Statistics data to assess rates of myocardial infarction, stroke, lower respiratory tract infection, renal failure, deep vein thrombosis, pulmonary embolism, and *C. Difficile* infection within 30 days of index surgery, as well as 90-day all-cause inpatient mortality. The authors give a fairly detailed explanation of their statistical methodology, having adopted a hypothesis-generating, rather than hypothesis-testing, analytical framework. In this series, 60% of the patients undergoing surgery were female, with a mean age of 69.2 years; 40% were male (mean age 67.1 years). Between 2005 and 2014, there was a consistent annual reduction in 90-day mortality rate from 0.60% to 0.15% (statistically significant). Interestingly, this occurred despite a simultaneous converse increase in the Charlson Comorbidity Index

over the same time period. Of the complications listed above, all fell annually (statistically significantly so), other than lower respiratory tract infection and renal failure, in which statistically significant increases were seen over the timespan of the study, from 0.54% to 0.84%, and 0.21% to 1.09%, respectively. The authors comment that the risk of mortality following lower respiratory tract infection is three times that seen with pulmonary embolism, yet no formal prophylaxis is provided to reduce the risk of respiratory complications. They also hypothesize that the increase in renal failure rates may be related to increased administration of gentamicin as part of a national drive to reduce *C. Diff* infection. Overall, the message is a positive one: that current medical complication rates following total hip arthroplasty in England are 3%, despite ever-increasing comorbidities among the patient population presenting for elective hip arthroplasty surgery. The authors' final recommendation that identification of 'at-risk' groups for development of renal failure or lower respiratory tract infection could potentially reduce this yet further seems entirely valid, against the backdrop of what is, on the whole, an encouraging conclusion.

Hip motion in cam deformity

■ The authors of this study from **Ottawa (Canada)** set out to develop some understanding of why, with regards to levels of symptomatology in the presence of cam impingement lesions, there is so much observed variation between

different patients.² The hypothesis is that the dynamic situation (with hip and pelvic motion) may explain these variations. The study revolved around a population of 57 patients (19 each with symptomatic cam lesions, asymptomatic cam lesions, or no cam lesion (controls)). The authors included an initial CT scan, which was undertaken to confirm the diagnosis (intra-articular injections were also undertaken in any patient where there was any lack of clarity over what the source of pain was the hip or not), and, from this, measurements were undertaken to quantify neck-shaft angle, femoral and acetabular version, acetabular coverage, and spinal pelvic tilt. All participants then underwent a range of assessments in a gait laboratory, including normal walking and squatting, with measurements of hip and pelvic movement recorded. The results demonstrated that patients with cam deformities are more likely to experience symptomatology with radial 1:30 alpha angle, larger pelvic incidence, or smaller femoral neck/shaft angle. The symptomatic group were also found to demonstrate substantially reduced hip and pelvic range of motion during squatting, as compared with asymptomatic and control groups. While the authors acknowledge the purely observational nature of this study, they postulate that these findings may help to generate better understanding of potential non-surgical options for treating symptomatic cam impingement, as well as assisting with patient selection in the group that eventually go on to arthroscopy,

maximizing the chance of a successful clinical outcome.

Radiotherapy and heterotopic ossification following total hip arthroplasty

■ Heterotopic ossification (HO), while not common, is a recognized complication of hip arthroplasty surgery, potentially conferring significant morbidity and reduction in symptomatic and functional outcome. The majority of hip heterotopic ossification is minor; however, at more advanced Brooker grades, the patients can suffer significant symptoms, and even ankyloses. There is a lack of consensus about what is the best way to treat this. While many patients do end up being offered surgery, the results are known to be varied. It has been well established previously that the risk of re-recurrence following surgical resection of HO can be reduced by perioperative radiotherapy at the time of surgical excision. Similarly, in patients known to be at high risk of HO, some authors advocate the administration of perioperative radiotherapy within 48 to 72 hours of index total hip arthroplasty (THA). Such 'at-risk' patients include those with known history of previous HO of the contralateral hip, ankylosing spondylitis, hyperostotic disease, and so on. This paper from **Montreal (Canada)** aims to establish whether late radiotherapy following the index THA can potentially reduce progression of the condition without the requirement for surgical excision. Prospectively collected data between 2001 and 2016 were used to identify

a total of nine patients, who had not been believed to be at increased risk of HO when admitted for hip arthroplasty. The patients were then noted, at either six- or 12-week follow-up, to be developing HO of Brooker Grade II or higher. Seven had undergone primary THA; two occurred following revision surgery. All patients received a standard 7 Gy radiation treatment within one to two weeks of the clinic follow-up, at which the HO was initially identified. Eight of the nine hips demonstrated no further progression of the HO following the radiotherapy; in the ninth, although there was some progression, this was not sufficient to change the final Brooker classification, nor was it associated with any loss of motion in the affected hip. The take-home message from this paper is simple but pertinent. It has been previously suggested that radiotherapy is ineffective in treating HO unless administered in the immediate perioperative period. While the authors of this study acknowledge the small number of patients in their series, and the absence of a control group, they correctly suggest that their results support a potential role for radiotherapy in minimizing the risk of HO progression, even when this condition is identified several weeks or months following THA, in patients not previously believed to be at risk. Given that the morbidity associated with this dose and regime of radiotherapy is small, these are certainly findings worthy of note and wider consideration.

Trochanteric fracture and the anterior on a fracture table

■ Although the direct anterior approach (DAA) to the hip continues to gain popularity, concern remains with regard to the complications profile. Proponents argue these are a 'learning curve' phenomenon; however, reports of higher complication rates abound and there is yet to be any evidence for improved surgical or implant outcomes in the short, medium, or longer terms. One of the

most widely encountered complications with the DAA is fracture of the greater trochanter (GT). This paper from **Palo Alto, California (USA)** examines a retrospective series of 1401 primary hip arthroplasties (876 female patients, 525 male patients) all undertaken through the DAA, and the authors attempt to identify associations predictive of GT fracture. Overall, the fracture rate was 2.2% (31 hips) in this series; 14 were not identified on the initial perioperative imaging, although the authors acknowledge that these were almost certainly occult fractures occurring at the time of surgery that were not initially radiologically visible. Multivariate analysis demonstrated the following as increasing the risk of fracture: preoperative diagnosis of rheumatoid or slipped upper femoral epiphysis; poor preoperative ambulatory status; high Dorr ratio; and low femoral neck cut ratio. The femoral neck cut ratio is a new concept described by the authors, comparing residual bone medial to the femoral neck cut against the size of the greater trochanter). As would be expected, trochanteric fracture is associated with prolonged length of stay. One patient went on to develop nonunion requiring surgical fixation; all other fractures healed with nonoperative treatment. The authors do not make a recommendation regarding which surgical approach to use for patients presenting with one of the identified risk factors for trochanteric fracture. It may be appropriate to consider different surgical approaches in these patients, or simply to ensure that they are counselled appropriately as to the risk. Perhaps, given the fact that almost half of the fractures were identified postoperatively, awareness of these risk factors allows treating surgeons to exercise particular vigilance. In any event, given that the DAA is undoubtedly here to stay, this paper provides some useful understanding about this particular complication. It is also worth noting the authors' own comment that this series

does not include the first 100 cases undertaken by the senior author. This therefore represents a genuine ongoing risk of this particular complication, rather than incorporation of the learning curve.

ERAS in the octogenarian arthroplasty patient

■ There is an increasing trend, based on both economic and clinical considerations, to discharge patients early following joint arthroplasty surgery using so-called enhanced recovery after surgery (ERAS) protocols. Reduced length of stay has been shown to be associated with lower complication rates, as well as clearly conferring financial savings. However, there is some concern as to whether this potentially places patients at risk of early readmission, particularly in older, frailer patients. This simple but well-executed study from **Little Rock, Arkansas (USA)** looks at precisely this question. The authors retrospectively identified 2482 patients who had undergone either primary or revision hip or knee arthroplasty, looking at age at time of surgery, American Society of Anesthesiologists (ASA) grade, length of stay, destination on discharge, and 90-day readmission rate. All patients were elective (i.e. none underwent total hip arthroplasty for intracapsular fracture); 162 of the patients were aged 80 years or over. Although length of stay in the octogenarian group was longer following total hip arthroplasty than in the younger population, the overall length of stay in octogenarians undergoing primary hip or knee arthroplasty was less than two days in more than 90% of cases. Over 90% of octogenarians were discharged directly home. Significantly lower readmission rates were observed in the octogenarian hip arthroplasty cohort compared with younger patients undergoing the same procedure. Although the discussion section focuses specifically on American health economic considerations, the broader take-home message is valid:

that, if services are potentially being rationed, there is nothing in these data to suggest that older patients undergoing hip or knee arthroplasty are at significant risk of a longer (and therefore presumably more expensive) hospital admission, nor at higher risk of readmission following discharge. Clearly, this paper does not attempt to analyze in any detail other potential confounding variables, such as comorbidity, social/domestic infrastructure, and so on. Nevertheless, it is useful in supporting the idea that, from an economic perspective, there is no argument for limiting access to total hip arthroplasty or total knee arthroplasty on age grounds, nor to managing the older patient cohort any differently in the postoperative recovery period.

Burnout and intraoperative irritability

■ Researchers in **Beijing (China)** have undertaken an enlightening (and at times amusing) paper that sets out to establish if the well-known phenomenon of burnout is associated with irritability in Chinese arthroplasty surgeons.⁶ The authors sampled a total of just over 200 adult arthroplasty surgeons in China and measured burnout using the Maslach Burnout Inventory-Human Service Survey. In addition, the authors collected demographic details, professional details, and intraoperative irritability-related questions. There was an overall rate of burnout of 85.1%, which was associated with poor sleep, more nights on call, and lack of research activity. From the depersonalization perspective, the absence of marriage and more nights on call per week were selected as risk factors. Almost 60% of surgeons admitted to losing their temper; this was more likely in senior surgeons. The three major reasons for irritation during operations included "delays by companies providing operative devices, poor coordination of assistants, and slow movements of instrument nurses". Burnout, in turn, was associated with



intraoperative irritability. It appears that a relaxed, happy surgeon with rapid scrub staff, available implants, and coordinated assistants are the least likely to experience burnout.

Triclosan and infection in arthroplasty

■ The avoidance of surgical site infection (SSI) is everyone's business in orthopaedics, and sometimes simple measures have been shown to be as effective as more complex and costly measures. Due to the issues with infection in terms of healthcare costs and quality of life, simple and apparently cost-effective measures can sometimes be introduced and gain widespread traction without any actual evidence to support their use. In this two-arm, parallel, double-blinded quasi-randomized trial from **Coventry (United Kingdom)**, the authors set out to challenge, or prove, the large-scale adoption of triclosan-coated sutures in both total hip arthroplasty (THA) and total knee arthroplasty (TKA).⁷ In one of the largest quasi-randomized studies we have seen in orthopaedics, the authors report the outcomes of 2546 patients undergoing elective

THA and TKA at three hospitals. A total of 1323 were quasi-randomized to a standard suture group, and 1223 were quasi-randomized to the triclosan-coated suture group. The primary outcome measure was confirmed SSI at 30 days. There were no differences in the primary outcome measures in terms of superficial infection, for which rates were found to be 0.8% in the control group and 0.7% in the intervention group. The combined overall infection rates were again not significant, at 2.5% and 1.8%. While we would agree with the authors that this trial provided no evidence that the use of triclosan-coated sutures at THA and TKA leads to a reduction in the rate of SSI, there are some potentially interesting observations here. Unusually, the deep infection rate was higher than the superficial infection rate, and the combined infection rate was rather high at up to 2.5%.

Physiotherapy-led outpatient service: an innovation or an irritation?

■ As orthopaedic surgeons, our time is limited by multiple different responsibilities, and creating a more efficient work environment has the potential to benefit everyone. On the other hand, in certain circumstances, physiotherapy-led outpatient services have been used as an excuse to introduce healthcare rationing and to reduce resource use. To that end, this study from **Dunedin (New Zealand)** evaluated the utilization of a joint clinic staffed by a nurse and physiotherapist for assessing patient's readiness for surgery.⁸ The authors evaluated the effectiveness

of their joint clinic over a two-year period and reviewed patients who had achieved a minimum 12-month follow-up. The clinic pathway included an initial assessment by a combined nurse and physiotherapist; baseline scores and demographic details were collected at this time and a personal care plan was instigated. Patients above an agreed severity threshold were referred for a first specialist assessment (FSA) if their severity justified surgical assessment. In total, there were 358 patients included in the study (hip osteoarthritis, $n=150$, 44%; knee osteoarthritis, $n=189$, 56%). The authors utilized the Oxford score as part of their assessment for FSA, which is somewhat curious as the Oxford score was specifically and carefully constructed to provide assessment of arthroplasties following surgery, not for triage to surgery or assessment of preoperative disability. In the reported cohort, the mean baseline Oxford score was 19.8; 54 patients were referred directly to FSA and 89 were referred after a subsequent review. It stands to reason that the scores of patients referred for FSA were significantly worse than those managed in the Joint Clinic. The majority of patients ($n=115/143$) underwent or were awaiting surgery. The authors concluded that their study "shows that the Joint Clinic was effective as a triage tool with 93% of those referred for FSA being recommended surgery". In other healthcare systems, these kinds of clinics have been used as a rationing tool, irrespective of patient need or disability. Care should be taken to ensure that these kinds of clinics are

appropriately monitored, as there is much scope to cut surgical workload, although this should not be to the detriment of the patient.

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