

ROUNDUP³⁶⁰

Hip & Pelvis

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Preventing dislocation after revision total hip arthroplasty

■ All complication rates increase in every branch of surgery each time a revision procedure is undertaken. However, there is not quite so much written on the topic as one might hope, especially in well-recognized complications like dislocation rates following revision hip arthroplasty. While series have been published, most report relatively small numbers of patients and do not always report in the same way, making comparisons difficult. For that reason, we were delighted, here at 360, to come across this systematic review from **Bologna (Italy)**.¹ The review team addressed the currently reported risk factors for, and incidence of, joint instability after revision total hip arthroplasty. They also undertook a review of the surgical options available to avoid such complication. After trimming down their search results, the team reviewed the reports of 33 different papers. The use of a larger femoral and acetabular component, elevated rim liner, and dual mobility implants were reported to have a significant benefit on stability postoperatively. However, the evidence cannot currently be taken much further than this.

Straight in the front for total hip arthroplasty?

■ Much has been published recently on alternative surgical approaches to performing a total hip arthroplasty. Proponents of the direct anterior approach (DAA) suggest that this approach results in a faster recovery with better earlier outcomes and a reduced risk of dislocation. However, does this perceived benefit over more traditional approaches come at a risk of additional complications, particularly during the learning curve? This meta-analysis from **Istanbul (Turkey)**

highlights some of the important controversies. The authors included 17 randomized controlled trials (RCT) and one 'quasi-randomized' controlled trial.² The majority of the included studies were small, with 33 to 163 subjects; the mean patient age was 62 years. Of the 18 studies reviewed, a posterior approach was included for comparison in ten and a lateral approach was included in eight. In terms of outcomes, the meta-analyzed Harris Hip Score (HHS) results suggest that DAA led to a significantly higher improvement in the HHS at six weeks, which was mirrored in the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores at six weeks. Three of the trials suggested that patients required less morphine equivalents on the day of surgery, but this was not continued into day one and day two postoperatively. Ten studies suggested that the DAA led to a significant reduction in hospital stay. A smaller incision was also observed associated with the DAA, and surgical time was only prolonged by seven minutes when comparing it with other surgical approaches. Although not all studies reported on complications, those that did reported intraoperative femoral fracture, component malposition, aseptic loosening, a snapping iliotibial band, and a ruptured tensor fascia lata following the DAA. Compared with the more traditional surgical approaches, there was a higher complication rate associated with the DAA (35 vs 27) but it did not achieve statistical significance. The authors of this study made considerable reference to the better clinical outcome measures following the DAA at six weeks; however, these conclusions should be reviewed with some caution. Historically, patients were in hospital for one to two weeks following a hip arthroplasty and considerable restriction was placed on their rehabilitation after surgery. Currently, patients who undergo a posterior approach for their hip arthroplasty are asked to follow certain guidelines to reduce the risk of posterior dislocation, including avoiding flexion beyond 90°, as well as avoiding adduction and

internal rotation. These 'restrictions' undoubtedly and unintentionally slow the pace of the patient's recovery following their THA, which could impact on the outcome scores measured postoperatively, such as those quoted in this paper. The authors do not highlight some of the surgical difficulties associated with the DAA, including poor exposure of the acetabulum leading to many centres using intraoperative fluoroscopy, or the attendant health economic costs. Little was made of the learning curve involved in performing the DAA; much has been published on this point, with many describing a higher complication rate. Complications have included intraoperative femoral fracture and injury to the lateral femoral cutaneous nerve of the thigh. Access to the femoral canal can also be difficult, resulting in a double-angled rasp being designed for easier broaching of the femoral canal. However, introducing a double angle to the handle reduces the amount of force that can be exerted during rasping. This may lead to undersizing of the femoral component. With an uncemented stem, this could lead to early failure due to aseptic loosening. Such complications can certainly be reduced in a high-volume centre such as The Rothman Institute, where the senior author of this paper practises. The outcomes following total hip arthroplasty continue to be a major success story in orthopaedic surgery. Surgeons considering changing their surgical approach should reflect on what benefit they hope to see for their patients, as doing so is not without risk. Should surgeons decide to change their approach to the DAA, then spending time with surgeons who are recognized experts in the DAA should hopefully avoid some of the significant complications associated with the learning curve of this technique.

Dual mobility versus large femoral head in revision total hip arthroplasty

■ The methods of reducing the risk of instability following revision THA include using a large diameter femoral head or a dual mobility bearing.

Large diameter femoral heads aid stability by increasing the jump distance needed to dislocate a hip, but also increase the contact surface area between the femoral head and the polyethylene acetabular liner, resulting in a greater potential for polyethylene wear. Dual mobility (DM) bearings have two articulations: one between the femoral head and the inside of the polyethylene liner, and one between the outer surface of the polyethylene liner and the metal acetabulum. The majority of the motion in a DM bearing is between the femoral head and the inside of the polyethylene insert, potentially giving a combination of the large outer diameter of the DM bearing and the more favourable wear characteristics of a smaller femoral head for this bearing in a revision setting. However, the DM bearing comes at an additional financial cost and some of the presumed benefits remain yet to be proven. We welcome this study from The Mayo Clinic, **Rochester, Minnesota (USA)**, the authors of which considered the cost implications of using a DM bearing compared with a large femoral head.³ A total of 126 patients who underwent a revision THA with a DM bearing were compared with 176 patients who were treated with a 40 mm large diameter femoral head. While the authors quoted the costs in the United States, the relative findings are just as applicable to other healthcare economies. Over a three-year period, 8.7% of patients in the DM group required further surgery, compared with 19.3% in the large femoral head group. The DM bearing represented a significant cost saving to the healthcare providers of between \$1500 and \$2611 over a three-year period, depending on how the patients' care was funded. Increasingly, we are challenged by our hospital procurement teams to justify what implants we use, particularly if there are cheaper alternatives available. The list price of a DM bearing is more expensive than the large femoral head bearing, but this study confirms that there is a lower risk of further surgery and, as a result, reduced costs to the healthcare provider over a three-year period associated with the DM bearing. The lower risk of further surgery in the DM group was largely attributed to its lower dislocation rate compared with the large femoral head group. DM bearings are thought to be more stable due to their larger effective head size, greater range of movement before they impinge, and increased jump distance. In conclusion, this study reported that not only do patients benefit from having a DM bearing construct as part of their revision surgery in terms of fewer reoperations, but also the overall health economy benefits from the associated cost savings.



Postoperative blood glucose levels predict infection after total joint arthroplasty

■ Infection after total hip arthroplasty is an extremely serious postoperative complication that causes tragedy in patients and carries with it significant health economic costs. It is widely accepted that patient comorbidities, as well as surgical technique and bad luck, are associated with postoperative infection. There has been a wealth of research surrounding postoperative deep infection in joint arthroplasty. This recent contribution from **Philadelphia, Pennsylvania (USA)**, which uses the team's formidable institutional joint registry, aims to establish the association between perioperative blood sugars and deep infection in joint arthroplasty.⁴ The authors draw on the outcomes of nearly 25 000 patients, all of whom underwent joint arthroplasty in their institution over a 14-year period. As is the way with institutional data sets, only around 13 000 patients had known outcomes at a year following surgery. The authors utilized this subset and attempted to link the postoperative morning blood glucose levels to the outcomes of prosthetic joint infection. The major finding from this study is that the expected one-year postoperative risk of prosthetic joint infection was linearly related to the postoperative blood glucose levels. This held true even when a multivariable analysis was utilized to account for potential confounders. In this series, the optimal blood glucose to reduce the likelihood of prosthetic joint infection was less than 137 mg/dl. The prosthetic joint infection rate in the entire cohort was 1.59% (1.46% in non-diabetics vs 2.39% in diabetes). The causal relationship between the blood glucose level and the infection risk on the first day after surgery has not been entirely discussed in this paper, especially considering that the surprising finding that this relationship is found only in non-diabetics appears to hold true. However, this paper really does represent a further step toward understanding the complex relationship between glucose control and complication rates.

Epidural opioids in total hip arthroplasty

■ As we start to look towards a value-based healthcare economy, understanding postoperative nausea and vomiting is becoming increasingly important. Most research focuses on new approaches, new implants, and optimizing longevity. However, simple measures to reduce postoperative nausea and vomiting could in turn reduce hospital lengths of stay through improving patient rehabilitation, compliance with physiotherapy, and ability to mobilize, as well as reducing pharmacy costs and nursing input. While many causes of nausea and vomiting are known, such as inhalation anaesthetic, epidural anaesthetic, and analgesics, there is little research into reducing this side effect. These researchers from **Isehara (Japan)** focus on the effects of post-epidural opioid administration with epidural catheters.⁵ The authors report what is essentially just a retrospective case series of 136 patients undergoing 155 primary total hip arthroplasties with epidural administration of opioids. The authors collected data surrounding the opioid dosage and administration, and related this to patient factors such as gender and body mass index. The postoperative nausea and vomiting rate was reported to be 33%. The major findings of this study were that there was a difference in risk for this side effect with gender, epidural opioid use, and body mass index. Traditionally, epidural opioids have not been thought to have a patient demographic link to their side-effect profile. However, this study clearly shows that thinner female patients are at increased risk of nausea and vomiting when an epidural is used, and that this risk was unrelated to opioid dosage.

Repeat two-stage exchange arthroplasty for prosthetic hip re-infection

■ Failure to completely treat infection after a two-stage revision THA is a devastating complication affecting between 6.5% and 26% of prosthetic joint infection (PJI) cases. There are multiple treatment options for recurrent infections, including debridement with implant retention (DAIR), antibiotic suppression, and further revision arthroplasty. However, the relative efficacy of each treatment option has not been widely studied. In this study, a group from **Rochester (Minnesota, USA)** reviewed 19 patients who underwent repeat two-stage revision THA, and evaluated the usefulness of McPherson's system in predicting implant survival and overall success for persistently infected hips.⁶ A total of 19 hips were classified as late chronic infection, with 18 compromised limbs and one uncompromised according to the McPherson staging system. Six of the patients were considered healthy, nine were

medically compromised, and four were substantially compromised. Following the repeat two-stage procedure, a total of 14 patients received additional surgical intervention. With the endpoint being revision arthroplasties, implant survivorship was determined to be 74% and 45% at two and five years, respectively. There was no statistically significant difference in the risk of re-revision or re-infection found between the patient cohorts determined by McPherson. This study does have limitations, as the number of cases studied was small, making it difficult to obtain significant results. The retrospective review suggests that repeat two-stage procedures have a

low success rate for those deemed compromised according to the McPherson staging system, and this should be taken into consideration when counselling patients for repeat two-stage procedures.

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