ROUNDUP360

Hip & Pelvis

x-ref *For other roundups in this issue that cross-reference with Hip & Pelvis see: Knee roundups 1 and 7; Trauma roundups 3 and 6; Children's orthopaedics roundup 2; research roundup 6.*

Serial MRIs best for pseudotumour surveillance

Metallosis and abnormal metal responses are well described following metal-on-metal hip replacements. The difficulties faced by clinicians and surgeons is the lack of a universally accepted accurate diagnostic test. Plain radiographs often demonstrate no changes until the hip has reached an advanced stage of bone loss and soft-tissue necrosis. Pseudotumours are one of the signature lesions associated with this condition and are well reported following metal-on-metal total hip replacement (THR), however, not all pseudotumours are symptomatic. Recently, national guidelines from both sides of the Atlantic recommended follow-up for patients following a metal-on-metal THR, supporting the use of MRI for assessment of patients. Although case series have been published to support this practice on a 'one off' basis, until researchers in **Tsu City (Japan)** turned their attention to MRI follow-up with this study, the value of longitudinal changes of the pseudotumour over time had not been established.[1] The research team report on the follow-up of a group of 188 large diameter, metal-on-metal THRs which were screened for pseudotumours with a routine baseline MRI. In this cohort, 36 hips showed pseudotumours, and 12 hips were revised after the initial scan due to symptomatic pseudotumour and an adverse metal ion response picture. There were 24 hips with asymptomatic pseudotumours that were studied longitudinally and form the cohort of interest. Each patient underwent a second follow-up MRI at a mean of 20 months. The authors found that larger pseudotumours were more likely to increase in size and there was no significant association between the change in size of the pseudotumour and patient characteristics. This study suggests that pseudotumours can change in size – even in asymptomatic patients; therefore, a single MRI study is no longer good enough to determine a patient's clinical care if a pseudotumour is discovered on screening MRI. It is becoming more and more clear that a comprehensive multimodal follow-up package is required in the longer term.

Is ultrasound good enough for MOM follow-up?

Staying with the theme of metal-on-metal (MOM) hip follow-up, surgeons in **Osaka (Japan)** set out to establish if ultrasound had enough diagnostic accuracy to diagnose early failure of MOM hip replacements.[2] They argued that, given the high cost and contraindications of MRI, ultrasound may be the study of choice for diagnosis of adverse local tissue reaction (ALTR) and may be applicable to a larger cohort of patients. The study team used a follow-up cohort of 131 hips in 105 patients who had a primary THR with a MOM or HXLPE bearing at a single institution. All patients had a routine follow-up ultrasound and an MRI within one month of their ultrasound. All ultrasounds were performed under hip joint motion with a standardised hip protocol. MRI was used as the gold standard to compare the ultrasound results. While ultrasound had greater than 80% sensitivity, specificity, and accuracy in the diagnosis of ALTR, it only achieved a 74% sensitivity in detecting ALTR around MOM bearings. While the potential cost saving using ultrasound rather than MRI is enticing, the authors recommend that although ultrasound is satisfactory, an MRI should be used in patients with a MOM bearing, and MRI should be used to confirm a diagnosis of positive ALTR on ultrasound examinations. This therefore begs the question what ultrasound adds to the workup other than in patients where MRI scanning is contraindicated.

Does weight loss in obese patients help?

Although initially there were varied views on the effect of mixing obesity and joint replacements, there is now fairly robust evidence to support not only a higher complication rate in obese patients but also higher rates of failure and poor outcomes. Due to the increased risk of complications, surgeons often counsel obese patients to lose weight prior to their total joint arthroplasty. There is some evidence to show that weightloss can be difficult to achieve and is sometimes only temporary. There is however little known about whether non-surgical pre-operative weight loss puts patients at a higher risk of post-operative complications secondary to malnutrition from crash diets. The surgical outcomes team at **San Diego (USA)** set out to establish if crash diets are a positive or negative in terms of outcome.[3] The study team undertook a retrospective review of the Kaiser-Permanente registry to identify patients who had a significant pre-operative weight loss. The study cohorts consisted of 444 patients who underwent a THR and 937 patients who underwent a TKR all of whom lost weight pre-operatively and either kept it off or lost additional weight post-operatively. The investigators identified a comparative cohort of patients who underwent a TKR and THR who remained the same weight pre- and post-operatively. Surprisingly the authors identified that patients who underwent a THR and lost weight pre-operatively had an increased incidence of deep surgical site infection (2.7%) when compared with those patients who remained the same weight (1.4%). Obese patients who underwent a TKR that lost weight and kept it off post-operatively also had a higher likelihood of re-admission within 90 days compared with patients who remained the same weight.

This study suggests that weight loss prior to total joint replacement with continued weight loss may lead to a higher risk of post-operative complications. It would appear from this data that a more gradual weight loss programme would be preferred to crash dieting.

Measuring acetabular anteversion on plain films

One of the benefits of any form of 'crisis' is that often thorough investigation into the causes yields additional very useful information. In the wake of the metal-on-metal issues and widespread evaluation of causes of failure for joint replacements of all types, attention has turned to the 'safe zones' for acetabular placement with clinical and pre-clinical data suggesting acetabular position is more important than previously thought regardless of the articulation type. Essential to improving component alignment and identifying patients who may be at risk of early failure is the accurate identification of the patients' component orientation post-operatively. This has been notoriously difficult to do on plain film radiographs with many researchers turning to either RSA or CT for an accurate estimation of component positions. In an ideal world this would be best achieved using plain film radiographs and there are several radiological methods that have been developed to do precisely this and measure anteversion of the acetabular component after a THR, however, each method uses different reference planes and radiological definitions. Accurate measurement of the acetabular component is important in reporting outcomes following THR and this study from **Fukuoka (Japan)** compared the reliability of five common methods (Lewinnek, Widmer, Liaw, Pradhan and Woo and Morrey) using plain radiographs compared with CT measurements using the same planes and definitions.[4] Certainly, if an accurate assessment of anteversion could be made using plain radiographs the potential cost savings, avoidance of ionising radiation to patients and ease of practice flow would be tremendous. In this retrospective review of 84 hips after a THR, inclination can be accurately measured on AP radiographs as compared with CT measurements.

When measuring anteversion, Widmer's method was not significantly different, however, the other four methods were significantly different compared with CT measurements. The authors found that the best method for assessing anteversion in plain radiographs is Widmer's method. This study suggest that plain radiograph accuracy is similar to CT using Widmer's method, and plain radiographs provide a lower cost and decreased radiation option to assess anteversion after a THR. An excellent and straightforward paper and if implemented, the use of straightforward radiological measures would cut healthcare costs dramatically on those patients in whom post-operative version needs to be determined.

Two-stage one-stage too many in fungal hip revisions?

The diagnosis of a fungal periprosethetic joint infection (PJI) after total hip replacement is fortunately extremely rare; but these atypical infections can be challenging for the surgeon especially in the early post-operative period. There are a number of small series that recommend a two-stage revision procedure with or without the use of a cement spacer for patients with a fungal PJI. The published data reports a very variable recurrence rate of 0%-25% of re-infection. In a small retrospective review of ten patients who presented to the ENDO-Klinik **Hamburg (Germany)** authors ask if similar results can be achieved with a fungal PJI and a one-stage exchange – obviously easier for the patient and surgeon.[5] The mean Harris Hip Score increased significantly from 51 to 74 points post-operatively and the Hospital for Special Surgery knee score also increased significantly from a mean of 36.8 points to 75 points post-operatively. Despite the small number of patients treated the study team achieved an impressive seven year follow-up. During that period only one patient had a re-infection and given the success of a single-stage revision should be considered for patients who present with fungal PJI. The authors of this paper however, stress the importance of surgeons adhering to strict anti-fungal and operative protocols both pre-, intra- and post-operatively.

35 is the magic number in arthroplasty x-ref

It is widely accepted that there is a 'magic number' for surgical competence and that with increasing volume comes better outcomes. What is however far from clear is where that lies, even for regularly performed procedures such as hip and knee replacement. Researchers in **Ontario (Canada)** set out to establish what the volume threshold is associated with increased risks of complications.[6] They used a propensity score method with a matched cohort study to essentially identify the annual volume threshold beyond which complications drop significantly. The study team were able to use a cohort of 37,881 patients who underwent their first primary arthroplasty and were followed to at least two years of follow-up. The primary outcome measure was the incidence of significant surgical complications including venous thromboembolism, death, infection, dislocation, periprosthetic fracture and revision. The outcomes were assessed with a multivariate splines model to surgeon volume and the risk for complications. The researchers established that a threshold of 35 cases a year was identified and performing less procedures than this results in an increased risk of dislocation and revision. There were 6716 patients whose surgery was completed by surgeons averaging less than 35 cases a year and they had higher rates of dislocation (1.9% vs 1.3%) and revision (1.5% vs 1.0%). The research team suggest that surgeons should be performing 35 or more cases a year in order to minimise complication and revision rates. This does not seem unreasonable.

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