

screen for signs of AVN of the lunate on plain films, CTs and MRI scans of the wrist.<sup>7</sup> They then reviewed the individual positive scans/imaging and the notes associated with the patient admission. Despite the wide-ranging methodology of the search, the authors identified just 51 cases of incidental Kienböck's disease and 87 cases of symptomatic disease. As perhaps would be expected, higher Lichtman grades were associated with symptomatic disease and the incidence of lunate collapse was higher in the symptomatic group (51% versus 18%). It is startling to see that Kienböck's disease is asymptomatic nearly 50% of the time, and, in addition, the observation that lunate collapse may be present in asymptomatic hands causes us to re-evaluate our understanding of the disease, and in particular the relationship between severity of collapse and symptomatology. We would love to see a review of those asymptomatic patients with interval imaging which would go a long way to

increasing our understanding of how the disease progresses.

### A triumph of technique over sense? Arthroscopic scaphoid nonunion surgery X-ref

■ Hand and wrist surgeons are moving more and more towards arthroscopic techniques. With the exponential advantages of small incisions, the possibility of better outcomes, and the ability to visualise structures without disruption to the overlying soft tissues, there is plenty of sense in trying to develop these techniques. However, there is also the concern that making a reliable operation more technically challenging could affect the reliability of the results. Researchers in **Seoul (South Korea)** report their own results of arthroscopic scaphoid nonunion surgery in an attempt to prove that it's not a triumph of technique over sense.<sup>8</sup> The authors describe their experience of 80 patients with mixed open (n = 35) and arthroscopically treated (n = 45) scaphoid nonunions managed over a four-year

period. Follow-up was achieved to an average of just over 30 months and evaluation included a CT scan, clinical review and patient scoring. There were no differences in union rates between the two groups, with 97% achieving union and both groups achieving improvements in strength and pain scores, as would be expected. The authors make the point that, in their experience, scaphoid nonunions can only be managed arthroscopically when there is no significant deformity or arthritis. While this paper has demonstrated that this is technically achievable without compromising results, it does beg the question, why put the scope in at all? Percutaneous compression screws work perfectly well in the same patient group in other series.

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## Shoulder & Elbow

**X-ref** For other Roundups in this issue that cross-reference with *Shoulder & Elbow* see: **Research Roundup 4, 6.**

### Is it the shoulder or the brain?

■ Predicting post-surgical outcomes is notoriously tricky. A good surgeon is not just technically gifted, but will always pick 'winners' on which to operate. That said, understanding the causes of poor outcomes is incredibly (and increasingly) important. A study team in **Birmingham (USA)** set out to solve the thorny question of whether or not the outcomes of shoulder surgery are affected by psychological distress, and if psychological distress in itself is associated with alteration in the perception of symptoms.<sup>1</sup>

The study team used the Shoulder Pain and Disability Index (SPADI), a validated score administered to 139 patients, all with a primary shoulder diagnosis. In addition, the patients completed a range of psychological tests including catastrophising and depression scales. Of perhaps most interest here is the result of the multivariate analysis which was performed to explain variation in the SPADI score as a primary outcome. Amazingly, the outcomes as measured by the SPADI score were not related to the primary diagnosis. However, there was a relationship between the SPADI score and catastrophising, lower self-efficacy, higher body mass index, disability and retirement status. This is an

interesting paper that again highlights to us here at 360 the importance of psychological factors, both in presenting symptomatology and evaluating outcomes.

### Is an external rotation sling really needed?

■ Following a series of studies from Itoy and colleagues based in Japan, it has become commonplace in some centres to apply an external rotation splint following anterior dislocation of the shoulder treated with closed reduction with the intention of reducing recurrence. Although the proponents of the method argue that it reduces the need for surgical stabilisation, patients quite frankly hate the slings. Holding your arm in external rotation makes sleeping,

eating and even walking through doors difficult. A review team in **Ontario (Canada)** have undertaken and published their meta-analysis of the available trials to date. The investigators were able to identify six studies reporting the outcomes of 632 patients.<sup>2</sup> The pooled group analysis suggested that there is no significant difference between the two groups in terms of recurrence or instability index scores. Given that there is no benefit seen here across six randomised controlled trials, and the external rotation slings are more expensive and cumbersome than traditional alternatives, here at 360 we wonder if there is currently any role for these devices in acute dislocation management.

## Finally a use for PRP!

■ Platelet-rich plasma (PRP) is a technology which has been looking for an application for many years now. The pages of 360 are littered with randomised controlled trials of varying methodological quality with a complete lack of efficacy reported. Many of these trials have concerned tennis elbow and golfer's elbow, a usually self-limiting conditions which typically get better if left well alone. Ambitious, impatient and sporty patients will, however, request their symptoms to be relieved sooner rather than later – and hence the search for a simple effective intervention. Various injections are available but the most widely used steroid injections give some benefit for a few weeks only. Other more sophisticated techniques with glamorous names have been proposed which may or may not belie their efficacy - dry needling, autologous blood injection and now platelet-rich plasma (PRP). Researchers from **Manchester (UK)** have undertaken a narrative review with the aim of establishing the efficacy of PRP in treating tennis elbow.<sup>3</sup> The authors here suggest that from their systematic literature review, PRP has a limited but important and effective role to play when physiotherapy has failed. So while we perhaps should indeed consider this as part of the armamentarium, it is worth remembering that the trials that do exist are limited in their support for PRP.

## Understanding the glenoid in reverse shoulders X-ref

■ The reverse shoulder arthroplasty is currently viewed as a panacea, with the range of indications growing almost daily. Despite the early clinical results looking excellent, those naturally cautious surgeons are becoming increasingly concerned about the different biomechanics and how these may affect long-term longevity. A sound understanding of the biomechanics is likely to result in a clearer understanding of appropriate surgical technique and therefore improved longer-term surgical

outcomes. We enjoyed this paper from **Hsinchu (Taiwan)** which examines the differences in stress variation seen with different designs of glenoid components in reverse total shoulder arthroplasties.<sup>4</sup> The authors undertook a finite element analysis (FEA) study to determine the stress variations in the glenoid components. In what is one of the most accessible FEA papers on the topic, the investigators summarise succinctly the best methods for reducing stress at the glenoid component interface. The investigators conclude that distal placement of the glenosphere and lateral offset protects the glenoid from higher stresses at the baseplate junction. Conversely, inferiorly tilting the glenoid and use of the increased bony offset method will incur higher stresses at the glenoid screws, which in themselves have differential stress. The inferior screw suffers greater stresses than the superior, and this is concentrated around the base of the screw. In an environment with ever-increasing utilisation of reverse total shoulder replacement for a wide variety of indications, this paper is a good point for the inexperienced shoulder surgeon to begin to understand the biomechanics of the glenoid component in these replacements, and therefore how to choose the appropriate implant and alignment for a given indication.

## Glenoid conformity and stress distribution

■ In an insightful look at the more traditional total shoulder arthroplasties, surgeons from **New York (USA)** investigate the potential advantages of non-conformity of the glenohumeral articulation.<sup>5</sup> The interplay between constraint, conformity, wear and stress uncoupling has been investigated in knee arthroplasty, where less conforming implants offload shear forces, although this has the potential disadvantage that

smaller contact areas give rise to higher contact stresses and more wear. As the weak link in shoulder replacement continues to be the glenoid component, the study team constructed computer models of nine patients' scapulae from CT scan images, and undertook analysis of three glenoid component designs: conforming, semi-conforming and hybrid designs. The finite element analysis modeling established that although the glenoid component was subjected to a similar level of maximum stresses at the centre, the conforming design was subject to significantly higher levels of maximum stress at the superior margin. There are clear differences



in the designs of prosthesis, and the effect they have on the glenoid prosthesis interface. This should obviously be considered

when designing new prostheses. However, given the range of glenoid designs currently available, the findings of this study could also be taken into account when undertaking anatomic total shoulder arthroplasty already.

## Is cuff tear a genetic phenomenon? X-ref

■ Understanding the pathophysiology of orthopaedic disease is central to developing treatments (particularly biological) to combat a range of pathologies. Rotator cuff disease, like other enthesopathies (such as Dupuytren's disease), has been shown to be due in part at least to matrix biology, with a range of pathways including the MMPs and WNT pathway implicated in the pathophysiology of disease. What has been inferred, but not necessarily proven up to this point, is that this may be a heritable factor. Research teams in **Salt Lake City (USA)** have undertaken the most complete genotyping study of patients both with and without rotator cuff tears.<sup>6</sup> The study revolved around 311

patients with rotator cuff disease and 2641 genetically matched controls sourced from the Illumina Inc. (San Diego, CA) Controls database. The study involves full genotyping for specific heritable factors associated with rotator cuff disease. The authors have been able to identify two single nucleotide polymorphisms (SNPs) associated with rotator cuff tears. While clearly many of these injuries are traumatic in nature, an understanding based on this paper and other related studies is beginning to unravel the pathophysiology of degeneration in rotator cuff disease. Given time, it will be possible to understand how to discriminate the shoulder at risk of developing rotator cuff tears and perhaps even tailor treatments according to the underlying disease pattern.

## MCID in reverse shoulder arthroplasty

■ Assessing outcomes is a complex topic. It is not enough to show just a simple statistical significance; that significance has to be clinically relevant. Clinically relevant differences are even more difficult to assess – clearly a small change on a score may not be noticed by a patient, but how much of a change is needed for the patient to subjectively say that their shoulder functions better than before? Investigators in **Barcelona (Spain)** have published their paper which carries a very important message: publication of patient outcome information is not enough, and it may be difficult to understand in terms of likely outcomes.<sup>7</sup> The authors use a longitudinal cohort study of 60 patients, all with cuff deficient shoulders treated with a reverse shoulder arthroplasty. The 'anchor' questionnaire method is used in combination with the Constant score at the one-year follow-up in order to allow for calculation of the MCID for reverse arthroplasty in this group. During the course of the study the mean Constant score improved from 30 pre-operatively to 58 post-operatively. Although

the composite scores increased by the MCID in around half of patients, the component scores varied, with just 20% of patients exceeding the MCID in forward flexion. The authors make a valid point concerning the need to reach the MCID. However, although just 50% of patients reached the MCID in this series, it is clear from previous methodology papers that the MCID should be taken for the overall score, not the subcomponents.

### Superobesity and shoulder arthroplasty

■ The term ‘superobese’ is a relatively new one, and is usually taken to refer to patients with a BMI of 50+. However, as the incidence of obesity is increasing, more and more patients are presenting in the various stages of obesity, including ‘superobese’. Other than the subjective heart sink surgeons feel when dealing with patients with a

large soft-tissue envelope due to the increasing technical difficulty of the surgery, there may well be also some specific risks of surgery to the superobese. Researchers in **Charlottesville (USA)** undertook a database study using the Pearl-Diver database to establish what the perceived effect of superobesity was on complications following shoulder arthroplasty.<sup>8</sup> As would be expected, there were a large number of patients included in this study. The results of 144 239 patients, including 23 864 obese, 13 759 morbidly obese and 955 superobese patients, were reported. The study team was able to identify a significantly higher rate of major complications (including infection, dislocation, loosening, revision, VTE and medical complications) following shoulder arthroplasty in the superobese group. This paper outlines some early experience with

this group of patients, and should inform surgeons and primary care physicians of the risks that obese patients face when undergoing shoulder arthroplasty surgery. Given that this group of patients is not going to disappear, it may be wise to examine measures to reduce complications and optimise outcomes while superobesity is still a rarity.

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## Spine

**X-ref** For other Roundups in this issue that cross-reference with *Spine* see: **Children's Orthopaedics Roundup 1; Research Roundup 6.**

### Shared decision-making in scoliosis surgery X-ref

■ Shared decision-making is a wholly unorthopaedic approach in many healthcare institutions. However, it is crucially important in everything from patient satisfaction through to medicolegal defensiveness. There are few more complex settings in which to attempt to achieve this than in spinal neuromuscular scoliosis surgery. The combination of complex decision-making, involvement usually of caregivers and a complicated risk benefit balance can make achieving a satisfactory decision rather difficult. Using a novel approach, spinal surgeons in **Jacksonville (USA)** report their efforts to apply a decision-making aid to this process.<sup>1</sup> Their study reports the development of a decision

aid using a multistep process of expert summation of current evidence, involvement of a multidisciplinary group and assessment against agreed decision aid standards. The aid was then utilised in a prospective fashion on 11 children, nine of whom opted for surgery following the process. The authors were able to report improvements in knowledge gain, satisfaction and decisional conflict by the caregivers in this particular setting. They conclude that the aid itself is a success and encourage the development of additional decision aids for other similar diagnoses.

### Diabetes and outcomes in spinal surgery

■ Diabetes is associated with almost every complication imaginable, and diabetics come to accept that the nature of their metabolic disorder is such that complications are associated with simple surgery, and almost every organ is affected.

Whilst there has been a reasonable focus on the effects of diabetes in terms of outcomes, there is little in the way of longer-term research establishing the effect (or otherwise) on surgical spinal outcomes. A study team from **Nashville (USA)** set out to evaluate the effect of diabetes in terms of outcome measures on a whopping cohort of 1005 patients, all having undergone elective spinal surgery.<sup>2</sup> Outcomes were assessed at one and two years using general quality of life measures (SF12 and EQ-5D) as well as disease-specific outcomes (Oswestry Disability Index). The cohort had 434 diabetic patients, and these had lower SF-12, ED-5D and poorer Oswestry disability scores. Even when looking at improvement in disability, the diabetic patients didn't fare as well as their non-diabetic control group. The diabetic patients did however make substantial improvements in both

quality of life and disability scores. Whilst diabetic patients in this series do not fare as well as their normal counterparts, and that in itself is important information, they do still make substantial improvements following spinal surgery and it is certainly possible that the restriction in improvement of outcome scores is due to other sequelae of diabetes.

### Scoliosis combined or posterior approach?

■ There is some controversy about the use of the combined anterior-posterior approach in treating idiopathic scoliosis. Whilst the plain posterior approach has the obvious benefits of operative time, reduced blood loss, and no need to turn the patient, the correction achieved may not be as effective and therefore longer-term outcomes may be compromised. We would draw readers' attention to this comprehensive review from