Shoulder & Elbow

X-ref *For other Roundups in this issue that cross-reference with Shoulder & Elbow see: Oncology Roundup 7; Paeds Roundup 2; Research Roundup 2, 3, 4.*

Nerves and cuff disease – a complex web

■ The pathophysiology of rotator cuff disease is complex and intimately linked to both the CNS and PNS. We were delighted to read this comprehensive review on the role of the nervous system in cuff disease from **La Jolla (California, USA)**. In what turns out to be a broad and wide-ranging review of the role of motor, sensory and central processing in the generation of pain, rotator cuff weakness and degeneration, the authors succinctly summarise the current evidence and understanding of the pathophysiology of rotator cuff disease.[1] It is now widely accepted that the cycle of mechanical disease, tendon health and subsequent atrophy is one driving aspect of rotator cuff disease. However, this cannot be the whole story from a symptomatic point of view as there is a relatively weak link seen between reported symptoms and physical tendon integrity. At least some of this disparity is likely explained by a combination of neurological factors. The authors of this review make the point that there is an extensive body of literature to support the assertion that individual patients have different profiles of biomechanical, motor control deficits, proprioceptive deficits and nociceptive impairments, all of which should be considered in the treatment of the specific rotator cuff disorder. As more is becoming known about rotator cuff disease, it is becoming increasingly clear that in fact it represents a constellation of similar pathologies – a clearer understanding of the aetiology would likely improve the reported treatment outcomes.

Minimal detectible change and Constant scores X-ref

■ Perhaps one of the most overlooked but essential bits of research is that of determining the minimal detectible change (MDC), also known as the minimal clinically important change. This is the smallest change in an outcome measure that results in a clinically relevant improvement for a patient. Determination of the MDC is an important part of the development and validation of an outcome score and relates directly and only to the condition tested. Hence, for each condition reported with the score, strictly a new MDC should be determined. There are many scores in use that have never had their MDC determined and researchers in **Leiden (The Netherlands)** have put valuable work into determining the MDC of the Constant score in impingement, full thickness tears and massive rotator cuff tears.[2] The paper succinctly describes the methodology and the discussion is excellent, with the authors pointing out that outcomes of possible important value to the patient may be missed by the conventional statistical methods of significance. The paper utilises clinical scores in 180 patients presenting with one of the three diagnoses (34 impingement, 105 supraspinatus tears, 41 massive RC tears) and goes on to determine the MDC for all three with the Constant score. Interestingly, despite the similarity of the diagnoses, the MDC was different in each case, with scores of 17 for impingement, 18 for rotator cuff tears and 23 for massive tears – essential information in interpreting trials on these conditions with outcomes measured using the Constant score. This paper conveys an important and basic statistical principle: that statistically significant differences between outcomes do not necessarily constitute clinically relevant or important differences.

Stability in ACJ reconstruction X-ref

■ The classification, and therefore treatment, of acromioclavicular joint (AC) instability remains problematic, with reliance on an older classification system (Rockwood), and some would say an understanding gap concerning the pathophysiology of ACJ disassociation. The development of new surgical techniques and implants such as the SurgiLig has caused a widespread re-evaluation of the treatment modalities and options. Researchers in **Munich (Germany)**[3] have added to what is an increasing evidence base of clinical, radiological, and biomechanical factors which are slowly moving the decision-making process in ACJ injuries towards determination of the best treatment for the specific pathology rather than basing decisions on an outmoded classification system. One of the biggest changes in understanding of this injury is the realisation that rotational instability of the disrupted joint is important as well as translational instability. The current study focuses on understanding of three dimensional movement associated with ACJ injury. The study team used 24 cadaveric shoulders tested using servohydrolic testing equipment. Following section of the stabilisation ligaments a range of different CC ligament repairs were effected and then tested for biomechanical stability. They conclude that anatomic repair of the AC capsule, as well as the coracoclavicular ligaments, is relevant to rotational stability of the joint, with direct wrapping of a graft round the ACJ and suture of the remaining ligament round the joint being the most stable reconstruction. This study adds to the increasing literature on the pathomechanics of AC instability and so will help to generate new ways of classifying the spectrum of disruption of the region, allowing better discrimination of which injury should receive which treatment may be gained.

Hemiarthroplasty in the elbow for fracture a viable option X-ref

■ Fractures of the distal humerus represent some of the most challenging injuries to treat. There have been previous reports in the unreconstructable distal humerus fracture of both conservative management and use of a total elbow arthroplasty, both of which have drawbacks. There is another option with the advent of the distal humerus hemiarthroplasty which may avoid the stiffness and instability associated with conservative management and the longevity issues associated with total elbow replacement. The difficulty of course is that there are few reports of this promising technology. Surgeons in **Linköping (Sweden)** report their experience of elbow hemiarthroplasty for fracture in a large cohort of 42 patients.[4] Outcomes are assessed to around 3 years and reported with the Mayo Elbow Performance Score in addition to the DASH and radiographic follow up. The authors report excellent functional results, with just a 23° extension deficit and an arc of flexion of 105 degrees. In this series the hemiarthroplasty was associated with a low rate of complications and there was just a single case of loosening at the three years reported follow-up. With Mayo Elbow scores averaging 90 and the DASH score of around 20, the results reported here are encouraging for the use of this implant in the more difficult fractures. Whilst the long term results are still to be established, hemiarthroplasty may indeed offer a viable option for these fractures in the future.

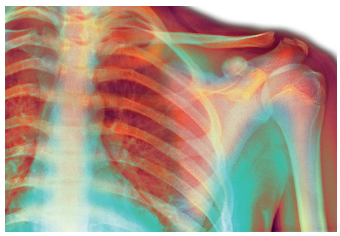
Rehabilitation choice irrelevant in cuff repair X-ref

■ In a well-designed randomised controlled trial clinicians in **Alberta (Canada)** have set out to unpick the somewhat thorny topic of rehabilitation strategy following rotator cuff repair.[5] Unusually, they chose

a mini-open cuff repair (although there are good studies suggesting open *vs* arthroscopic rotator cuff repair are equivalent in outcomes) and then randomised patients to either initial immobilisation or early rehabilitation. Traditional wisdom suggests that a period of immobilisation is required to allow the cuff to heal prior to starting mobilisation – the difficulty, of course, being that immobilisation post-surgery can result in stiffness. The study was powered to examine range of motion as the primary outcome measure. Patients were enrolled and randomised to one of the two treatment groups with outcomes assessed at regular intervals (6 weeks, and 3, 6, 12 and 24 months) post-operatively. Early range of motion was significantly better in the early mobilisation group in terms of abduction and scapular elevation. By the end point of the study, two years after surgery, there were no discernible differences between the two groups in clinical outcomes. Whilst the authors conclude that this leaves the choice of rehabilitation method to the surgical team, we would take a more opinionated view here at 360. If the point to rehabilitation is to get the patients better quicker, and there are no long-term adverse effects demonstrated by early rehabilitation, then surely this should be gold standard?

Predicting complications in olecranon fractures X-ref

■ The humble olecranon fracture has been grabbing some limelight recently with a paper featured in 360 recently highlighting pointers for success in tension band wiring. This edition we are keen to share an excellent paper from **Boston (Massachusetts, USA)** trying to unpick the difficult topic of reoperation in olecranon fractures.[6] Noting that there is a high rate of reoperation in the olecranon and that many of these procedures are for implant removal, this retrospective review of 392 patients, all with displaced olecranon fractures, aims to establish what, if any, are the factors predictive of success. Their retrospective



review of these nearly 400 patients included a range of fixation modalities (138 plate and screw and 254 tension band wiring) and outcomes were assessed to a minimum of one year following surgery. The authors note that almost all patients with displaced olecranon fractures are treated operatively in their institution, and that exactly a quarter of these ended up with a second operation. The majority of these were for implant removal (93%) but 12% were for wire migration. In terms of predictors of requirements for implant removal, the male sex (OR0.31) and older patients (OR 0.75) were much less likely to require removal of the implants. Most patients in this series kept their implants, and particularly older males were unlikely to require implant removal.

Obesity, complications and shoulder arthroplasty

■ As the number of patients requiring total shoulder replacement is increasing and so are the numbers of cases being performed, shoulder arthroplasty is becoming commonplace. What was once a niche operation is now performed in the majority of developed hospitals, and patients are attending clinics aware of the risks and benefits of shoulder arthroplasty in its many different guises. A topic of interest in the wider arthroplasty world is the influence of obesity on complications and outcomes. Surprisingly, there is next to no data to inform patients or their clinicians what the likely implications of obesity are when undergoing this surgery. Researchers from **Chicago (USA)** have used a national surgical dataset to establish the 30-day complication profile and relate it to the WHO BMI categories.[7] The study population included 4796 patients, all of whom underwent primary total shoulder arthroplasty (TSA) for shoulder osteoarthritis and complication and BMI data were extracted from the American College of Surgeons National Surgical Quality Improvement Program. Whilst there was no association between complications and BMI category in this patient group, there was an association between obesity class and length of surgical time. This paper is reassuring for obese patients and their surgeons requiring a TSA for shoulder osteoarthritis. Although the operative procedure is clearly more technically demanding – requiring greater operative times - this does not translate into higher complication rates and patients can be reassured that TSA in the obese is a viable, reliable and mostly complication-free experience.

Bringing massive cuff tears into focus

■ Finally we would draw our readers' attention to a review from **Miami (USA)**. This is a helpful introduction and review of the pathomechanics and management strategies for massive rotator cuff tears with an extensive bibliography.[8] It will be a useful article for those revising for the FRCS (Orth) or American Boards exams.

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