Shoulder & Elbow

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Degenerate rotator cuff tears: steroids under the spotlight

In a well-conducted randomised controlled trial comparing surgical treatment (subacromial decompression and cuff repair) to physiotherapy, investigators in **Pori (Finland)** set out to establish the optimum outcome for degenerative rotator cuff disease.[1] In a three-way randomised controlled trial, 180 patients were allocated to either physiotherapy, acromioplasty and physiotherapy, and rotator cuff repair or both with cuff repair. Outcomes were assessed at two years using the Constant Score as the primary outcome measure with secondary measures of, amongst others, pain and satisfaction scores. There were 167 patients available for review at two years, and the headline results of this study were that there were no differences between any of the groups, although all groups improved throughout the duration of the study. There were again no differences in pain or satisfaction scores. Despite the lack of clinical improvements, the authors established that the repair group did have smaller residual tears, but this did not translate into improved clinical results. Based on the outcomes presented here, it seems that conservative interventions should be the first line standard of care for these difficult to treat patients.

Semi-constrained elbow arthroplasty in the younger population

Arthroplasty in the upper limb has not enjoyed the history of long-term success as that in the lower limb. While technology has moved on rapidly with regard to the elbow, arthroplasties still have a mixed picture and are in general considered to have a poor outcome in the young population (aged under 40 years). With the newer technologies of semi-constrained elbow arthroplasties, the outcomes have been improved. The results from clinicians in **Seoul (South Korea)** fly in the face of conventional wisdom and they are able to share their experience and outcomes of TER in the under 40 age group.[2] Their series reports 23 elbow arthroplasties performed on patients and followed up to an average of ten years. The authors report impressive functional results, with pain VAS scores falling from 5.8 to 1.6 post-operatively. In terms of longevity, the authors report a 13% loosening rate and revision rate of 22%. While the number of cases reported is small, this is one of the few long-term clinical outcome reports of total elbow replacement and is one of the first indications that newer elbow technologies may allow satisfactory results in younger patients in the longer term.

Physiotherapy and arthroscopic findings

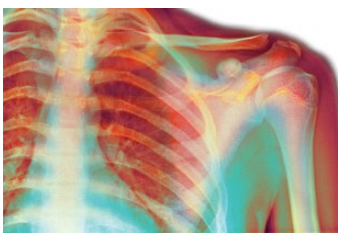
Physiotherapy plays a central role in the rehabilitation of musculoskeletal injuries the world over. As healthcare systems are moving more towards a value agenda, physiotherapists are extending their scope and in many healthcare systems are seeing new and undiagnosed patients – a practice for which there is, perhaps unsurprisingly, little evidence. A surgical team in **Adelaide, Australia** set out to evaluate the ability of physiotherapists to identify shoulder pathologies using a standardised assessment protocol.[3] The same patients then underwent arthroscopic assessment, and the ability of the physiotherapist to evaluate their pathology was then established. The cohort of 211 patients had a prevalence of subacromial impingement of 77% and ligamentous injury in 29% of cases. While the physiotherapists were able to identify broad pathologies, their ability to discriminate between, say, tendon rupture and tendinopathy was poor. This is one of the few studies published evaluating the diagnostic accuracy of physiotherapy-based clinical accuracy and finds physiotherapy assessment to be inconsistent and only able to distinguish broad categories of pathologies at best.

Platelet rich plasma and subacromial decompression under the spotlight **X-ref**

There has been much research effort put into seeking an application for platelet rich plasma (PRP), however, despite the combined efforts of many clinicians and scientists worldwide, PRP continues to prove ineffective in study after study, whatever the indication. Researchers at the Botnar Centre, **Oxford (UK)** have turned their attention to the potential for PRP as an augment for subacromial decompression in shoulder surgery.[4] Their randomised controlled trial asks the question: is subacromial decompression (SAD) with PRP injection superior to SAD alone? In their two-arm RCT, 60 patients with rotator cuff tendinopathy were randomised to either SAD alone or in combination with a subacromial injection of PRP. The primary outcome measure was the Oxford Shoulder Score (OSS) at two years following intervention in addition to histopathological analysis of tendon biopsy specimens taken at 12 weeks following treatment. The two groups showed no differences in the OSS at any time point during the study, although there were significant improvements from baseline in both groups at 12 weeks following surgery. There did not appear to be any histopathological benefit of using PRP treatment, with some changes noted in terms of decreased cellularity and vascularity combined with increased apoptosis in the tendon group.

Snapping scapulas best left alone?

In a very topical paper that illustrates the importance of study design to us here at *360*, shoulder surgeons from **Helsinki (Finland)** report their experiences with resection of the medial border of the scapula for trauma.[5] This is a technique that has become popular for patients presenting with chronic snapping scapula but there are few long-term follow-up series or comparative case series. In one long follow-up series, the surgical team was able to trace 15 patients who underwent open debridement of a snapping scapula between 1971 and 1997, and these were compared



with the outcomes of nine patients managed non-operatively over the same time frame. The study team was able to report the outcomes of 12 operatively treated patients at 27 years of follow-up, and nine non-operatively treated patients at 22 years of follow-up. Crucially, while the surgical group improved and their pain scores were low (0.8 mean VAS score), this was not significantly better than the non-operative group (1.5 mean VAS score). There was a variable occurrence of crepitus in both groups, with a significantly lower incidence in the surgical group. All patients reviewed returned to work following either surgery or the non-operative decision. While operating had no beneficial effect on pain in this series, it did reduce the incidence of crepitus. The addition of a comparator group shows the long-term natural history

of the disease – essentially what is being treated with surgery is the crepitus, not the pain.

Intra-operative iatrogenic humeral fractures during TSA revision

As shoulder arthroplasty is coming of age and becoming more widely available and long-lasting, the revision shoulder is becoming a more commonly observed challenge. The widening of indications for shoulder arthroplasty in addition to the higher volumes is, as would be expected, resulting in a higher revision burden; one of the challenges associated with this increasing revision burden is dealing with intra-operative complications including humeral fracture. The shoulder arthroplasty team in the Mayo Clinic in **Rochester (USA)** undertook a retrospective analysis of their arthroplasty database to evaluate just how much of a problem intra-operative iatrogenic humeral fracture is during revision arthroplasty.[6] Over a seven-year period, 230 revision reverse arthroplasties were performed in a single institution with an incidence of intra-operative humeral fracture of 16% (n = 36). In the majority of cases humeral fractures occurred during the removal of the primary stem (81%) and, irrespective of aetiology, the majority could be treated with a long revision humeral stem alone (84% n = 28/33) with the remainder requiring adjunctive fixation. The risks for intra-operative fracture included being female, a history of shoulder instability and prior hemiarthroplasty. There were no differences in survival (2-year 94% *versus* 89%; 5-year 85% *versus* 84%) between those patients with intra-operative fractures and those without. While the rate of intra-operative fracture is significant in this series, there are few long-term complications associated with intra-operative fracture. It should not be seen as a bar for good outcomes, but surgeons managing these cases should have the appropriate skill mix and access to suitable implant inventories to manage what is such a common complication.

Mechanism of cuff tear does not affect outcome

While surgeons make a distinction in their own minds between traumatic and atraumatic tears of the rotator cuff, the clinical significance of this oft–asked bit of history is far from clear. A research team in **Sydney (Australia)** report their own series of 1300 consecutive patients, all with a rotator cuff tear.[7] The authors stratified patients by the presence or absence of a clear history of a traumatic precipitating event, and evaluated outcomes using shoulder range of motion and strength following their arthroscopic evaluation and repair. Of the initial cohort there were 489 with no history of trauma and 811 with an atraumatic tear. All were then assessed at six months following surgery. There were no significant differences in re-tear rates between the two cohorts (12% in traumatic group, 14% in the atraumatic group). Despite the lack of difference in traumatic and atraumatic re-tear rates, what could be gleaned was that a delay to surgery in the traumatic group led to a significantly higher incidence of re-tears (20% *versus* 13%). Based on the results of this impressively large (although by definition, selected) series, a history of trauma does not predispose to a good outcome following rotator cuff tear, and if a repair is going to be effected this should be before two years to improve the longer-term outcomes.

Biceps poorly visualised on MRI scanning

The presence of biceps pathology is one of the more difficult and subtle shoulder diagnoses to make but can have a profound effect on treatment strategy (e.g. SLAP tear *versus* Bankart). Imaging has been of mixed benefit and while the MRI scan has revolutionised imaging of the shoulder, there is little data surrounding the specificity and sensitivity of MRI scanning for biceps pathologies. Researchers in **Toronto (Canada)** undertook a prospective diagnostic study to compare the findings on MRI scan with arthroscopic findings.[8] The surgical team recruited 183 patients (130 with biceps pathology and 53 without) into their study. All patients had a primary diagnosis of impingement syndrome or rotator cuff tear. The sensitivity and specificity of biceps pathology was much lower than might have been expected. MRI scanning was only around 50% sensitive for full thickness tears and 27% sensitive for partial thickness tears, although in common with other diagnoses specificity was excellent on both counts. While an abnormal MRI scan can be said to rule biceps pathology in, a normal scan cannot be said to rule it out. Addition of contrast could potentially increase the diagnostic accuracy, although there is little good evidence surrounding contrast MRIs in the shoulder either.

REFERENCES

1. **Kukkonen J, Joukainen A, Lehtinen J, et al.** Treatment of nontraumatic rotator cuff tears: a randomized controlled trial with two years of clinical and imaging follow-up. *J Bone Joint Surg [Am]* 2015;97-A:1729-1737.
2. **Park JG, Cho NS, Song JH, Lee DS, Rhee YG.** Clinical outcomes of semiconstrained total elbow arthroplasty in patients who were forty years of age or younger. *J Bone Joint Surg [Am]* 2015;97-A:1781-1791.
3. **Magarey ME, Jones MA, Cook CE, Hayes MG.** Does physiotherapy diagnosis of shoulder pathology compare to arthroscopic findings? *Br J Sports Med* 2015. (Epub ahead of print)
4. **Carr AJ, Murphy R, Dakin SG, et al.** Platelet-rich plasma injection with arthroscopic acromioplasty for chronic rotator cuff tendinopathy: a randomized controlled trial. *Am J Sports Med* 2015;43:2891-2897.
5. **Vastamäki M, Vastamäki H.** Open surgical treatment for snapping scapula provides durable pain relief, but so does nonsurgical treatment. *Clin Orthop Relat Res* 2015 Oct 30. (Epub ahead of print)
6. **Wagner ER, Houdek MT, Elhassan BT, et al.** What are risk factors for intraoperative humerus fractures during revision reverse shoulder arthroplasty and do they influence outcomes? *Clin Orthop Relat Res* 2015;473:3238-3234.
7. **Tan M, Lam PH, Le BT, Murrell GA.** Trauma versus no trauma: an analysis of the effect of tear mechanism on tendon healing in 1300 consecutive patients after arthroscopic rotator cuff repair. *J Shoulder Elbow Surg* 2016;25:12-21.
8. **Razmjou H, Fournier-Gosselin S, Christakis M, et al.** Accuracy of magnetic resonance imaging in detecting biceps pathology in patients with rotator cuff disorders: comparison with arthroscopy. *J Shoulder Elbow Surg* 2016;25:38-44.