

ROUNDUP³⁶⁰

Shoulder & Elbow

For other Roundups in this issue that cross-reference with *Shoulder & Elbow* see: [Hip & Pelvis Roundups 1, 2 & 4](#); [Trauma Roundup 5](#).

The sternoclavicular joint revisited

■ Complimenting superbly our feature article this month, researchers in [Cambridge \(UK\)](#) describe yet another evolution of arthroscopic surgery: sternoclavicular joint arthroscopy. Often extremely difficult to treat, patients complaining of both traumatic and degenerative diagnoses of the sternoclavicular joint, have traditionally been left with conservative treatment (and no resolution of symptomatology) or running the gauntlet of open operative intervention and the significant risk of complications (not just limited to the obvious risk of damage to mediastinal structures, but also risks associated with post-operative instability and scarring). In a technical review article Graham Tytherleigh-Strong describes not only the operative technique but also discusses the indications for, and surgical results of, arthroscopic management. This new approach has been used in over 50 patients and indications have included diagnosis, discectomy, loose body excision, treatment of septic arthritis and medial clavicular excision.¹ Here at 360 we can see the obvious merits of such a simple approach to what has previously been an extremely difficult joint to treat. The attractions are obvious, and while not currently widely accepted we would encourage our readers to consider this innovative

approach next time they have a patient with such a problem. The sternoclavicular joint arthroscopy forms the basis for 'Technique in Focus' this month in 360.

Surgical simulators: more than just a fancy idea?

■ With cuts in training provision due to contraction of working time for trainees and the continuous push across the world for 'consultant-led care', the impact on surgical training has been noticeable. Surgeons often draw parallels with the airline industry (although how relevant these may be in practice is difficult to know), with the need for extreme safety and a very low error rate. Airline pilots have long undergone many hours of flight simulator training allowing them to recreate normal flight and get used to simulated emergency conditions. The most modern of simulators can even replay actual 'black box' recordings from real events. Without the sophistication of flight simulators and the difficulties of achieving a realistic augmented reality, surgical simulation, in orthopaedic surgery at least, has never really taken off. Researchers in [Massachusetts \(USA\)](#) set out in a scientific manner to challenge the belief that surgical simulation does not have a routine place in orthopaedic training. Using a shoulder arthroscopy model, the research team designed an innovative randomised controlled trial seeking to establish the benefit or otherwise of simulation in reducing the learning curve in shoulder arthroscopy. Medical

students with no previous experience were enrolled into and completed the study. At baseline, 17 students performed a specific goal-directed cadaveric shoulder arthroscopy with evaluation of surgical technique including camera control and the ability to perform a limited number of standardised tasks. Subsequently, the medical students were either randomised to virtual reality training (nine candidates) or not (eight candidates) and then a repeat arthroscopy evaluation. Following this, all candidates undertook a final cadaveric arthroscopy task which was videoed. Outcomes were assessed using blinded video assessment for time-to-completion of surgical tasks and subjective assessment of surgical performance. Analyses were performed with paired *t*-tests to establish the benefit of simulator training. While the study team found no differences in baseline abilities between the two groups, there was a significant difference in improvement in the simulator group at final evaluation.² While the authors were delighted with the results of the simulator training and concluded they had provided "important additional evidence of the benefit of simulators in orthopaedic surgical training", we are less enthused here at 360. What in fact the authors have demonstrated is that when training surgically naive medical students with no previous experience, a simulator session is beneficial; this is hardly a surprising finding. We would be much more interested in finding out the benefit

of simulator sessions on surgeons' training and if the time and financial investment of a parallel simulator training (which is bound to erode clinical exposure or other teaching modalities) is beneficial to actual surgeons. We would love to see the results of that study.

Arthroscopic tennis elbow release

■ Here at 360 we always find tennis elbow a bit of a sticky wicket. Patients often present with refractory symptoms, are in significant pain, and often as not they stay that way, whatever treatment modality is proffered. We were intrigued, therefore, when this report from inventive arthroscopists in [Bergen \(Norway\)](#) crossed the news desk here. The authors present comparative outcomes for both open and arthroscopic tennis elbow releases in a retrospective case controlled series (Level III evidence). The patients were treated as a serial cohort, with 80 patients treated with open release compared with a separate cohort of 225 patients treated subsequently with an arthroscopic release of the origin of extensor carpi radialis brevis (ECRB). All patients included in the study had undergone a trial of conservative treatment followed by one of the operative treatment options and were followed-up for at least three years. The diagnosis of tennis elbow was reached with a typical history and examination findings. Sensibly, the study team excluded patients with concomitant elbow diagnoses or who had

undergone previous surgery. There were no baseline differences in patient demographics (age, gender, affected side, duration of symptoms or baseline DASH score). No patients within either group suffered a significant complication and there were no differences in perceived success rate of the operation between groups. The major positive finding of the study was the observation that there were significantly better Quick-DASH scores in the arthroscopic *versus* open group (11.6 points *versus* 17.8 points) and there was a similar improvement in the number of excellent results in the arthroscopic group (78% *versus* 67%) at final follow-up.³ Those cunning arthroscopists have again found yet another use for the arthroscope (although we do wonder if, given this is outside of the joint, it is really arthroscopy at all) and in this case the results appear to be significantly better than with open surgery. These results should, however, be read with a slight note of caution; when introducing a new technique there is both a learning curve and selection bias effect. This series is large enough to have overcome any learning curve effect but it is possible that there is a selection bias due to a lower threshold for surgery in the arthroscopic group.

Costly stabilisation of the clavicle

■ The precise indications for the fixation of clavicular fractures seem to vary from month to month in the literature. Surgeons from **Reno (USA)** took a fresh look at the problem from the perspective of health economics. Previous arguments have focused on functional outcomes, non-unions and complication rates but (to our knowledge) there are no clinical papers focusing on health economic outcomes. Using a fracture database, 204 patients were identified who had sustained displaced mid-shaft clavicular fractures and the research team then undertook a chart review and issued questionnaires to collect additional data (such as return to work times) and current status. Patients

who underwent operative treatment reported less chronic pain (6% *versus* 25%), cosmetic deformity (18% *versus* 32%), weakness (10% *versus* 34%), and stiffness (15% *versus* 31%), although there were only a few non-unions in the non-operative group (4.8%). Perhaps more importantly, operative patients missed fewer days of work (8.4 days *versus* 35.2 days) and required less self-care support (three days *versus* seven days). The authors report that mean income lost was \$321.69 *versus* \$10506.25 per patient.

Those patients treated operatively had excess costs in the emergency department (\$2060.51 *versus* \$1871.92) and an excess of \$5000 on their hospital bill. When taking into account clinic visits, physiotherapy and medication costs, the operative group was cheaper to treat (\$12 976.94 *versus* \$18 068.27).⁴ The results here, at first glance, do appear to speak for themselves; operative stabilisation of clavicular fractures is cheaper and better. We would politely point out a few vagaries in the figures, however, and leave you to make your own interpretation. While this is a fascinating paper, we are immensely surprised by some of the things it has turned up. A 25% chronic pain rate in non-operative clavicular fractures is at great odds with the majority of other published literature, as are the rates of stiffness and weakness in both groups. We also find it slightly curious that the non-operative group appear to have an average annual income of \$110 000, whilst the operative group just \$14 000. We wonder if there has been something lost in translation! A paper with results that should be eyed with a certain amount of suspicion.

A better treatment for tennis elbow?

■ Having been won over by our colleagues in Bergen as to the benefits of arthroscopic release in tennis elbow, we find ourselves

now questioning the wisdom of any form of surgery at all. A study group in **Silkeborg (Denmark)** have reported this month on a well-designed randomised controlled trial to establish the efficacy (or otherwise) of platelet-rich plasma (PRP) injections. The researchers designed a three-arm trial (Level I evidence), randomising patients with a diagnosis of tennis elbow to injection with one of saline, PRP or steroids. Outcomes were assessed at three months (the



primary outcome was pain assessed using the Patient-Rated Tennis Elbow Evaluation (PRTEE) with secondary outcomes of ultrasonic changes in tendon thickness and duplex Doppler scans. Randomisation was performed for 60 patients with a 1:1:1 ratio. The research team was unable to identify any differences in pain between the three groups; at three months they all improved, but by the same amount. The same was not true for the interval results with glucocorticoid outperforming both of the others in pain at one-month reviews. Glucocorticoid was also more successful at reducing tendon thickness and Doppler activity at all of the follow-up points.⁵ This study would suggest to us that in the longer-term there are no differences between injecting any of the three injections studied. While saline is clearly the most cost-effective, there is some limited evidence that steroids may treat the underlying pathology, and we will be continuing to use glucocorticoid injections.

Shock news: surgeons and radiologists agree

■ The difficulty with even gold standard investigations is that no test

is completely reliable. Researchers in **Ann Arbor (USA)** sought to assess the reliability of MRI in the diagnosis of full and partial thickness cuff tears, reasoning that this is an important distinction and that there may be some variation in concordance between surgeons and radiologists. Using previously acquired shoulder MRI scans, the researchers designed a study to test the reliability of the reporting of shoulder MRI by fellowship-trained shoulder surgeons. Initially the MRI scans were reviewed by two musculoskeletal radiologists and agreement reached about the type, size and nature of any cuff tear. The scans were then independently reviewed by 16 fellowship-trained shoulder surgeons who undertook a similar diagnostic exercise, two months apart. The research team then calculated intra- and inter-rater reliability using the kappa statistic for both surgeons and MSK radiologists. The results were marginally better for the full thickness tears with intra-rater reliability over 0.85 (95% CI 0.81 to 0.91) and agreement of 93.4% (95% CI 91.1 to 95.8). The inter-rater reliability calculated for both reporting sessions was also excellent (0.77 and 0.74). Absolute agreement was reached between the surgical and radiology reporting on over 90% of occasions, with a kappa statistic of 0.85. The investigators identified a much lower agreement when the partial thickness tears were included, with agreement ranging between 65% and 92% and kappa values of 0.59 to 0.72.⁶ We would agree with the authors, that the reliability of MRI as an imaging modality to detect full thickness tears amongst and between shoulder surgeons and radiologists was excellent. We were also not surprised that the addition of partial thickness tears muddied the picture somewhat.

Overhead athletes and SLAP repair

■ Overhead throwing athletes are known to have a high rate of SLAP and partial thickness rotator cuff tears. The presence

of a partial thickness cuff tear in association with a SLAP tear is a difficult combination to manage in overhead athletes. Little is known about the complex functional characteristics following injury, and particularly the differences between overhead athletes and the rest of the population. Researchers in **Kaunas (Lithuania)** designed a prospective comparative series (Level II evidence), to establish the differences between athletes and overhead athletes at two years following arthroscopic treatment of combined type II SLAP and partial thickness rotator cuff tears. The research team recruited 38 athletic patients (19 overhead athletes), all presenting with an isolated shoulder injury consisting of a grade II SLAP and partial thickness cuff repair. Clinical assessment was undertaken prior to surgery and at a minimum of two years following surgery. Clinical evaluation consisted of ROM measurement and the Constant shoulder score. The research team established that the functional improvement in the non-overhead athlete group was significantly better than in the overhead athletes, and that although improvements in flexion and internal rotation were similar, there was very little improvement in external rotation in the overhead

athlete group.⁷ The authors conclude, and based on their results we here at 360 tend to agree with them, that perhaps early sport- or activity-based rehabilitation is especially important in the overhead athlete group in an attempt to reduce the functional deficit seen in this group in the longer term.

Total shoulder arthroplasty more effective than hemiarthroplasty

■ The jury seems to us here at 360 to still be very much out on the most effective form of shoulder arthroplasty. A cursory PubMed search reveals nearly 1500 articles published in the last five years concerning shoulder arthroplasty of various varieties. Attempting to provide some clarity in the resurfacing *versus* hemiarthroplasty *versus* total shoulder *versus* reverse shoulder argument, researchers in **Sichuan (China)** set about evaluating the evidence for either total shoulder arthroplasty (TSA) or hemiarthroplasty (HA) for osteoarthritis alone. Using tried and tested methodology, the study team searched all of the major indexing services for randomised and quasi-randomised controlled trials in an attempt to determine the effect of TSA and HA in treatment of shoulder arthritis. Studies were screened

for eligibility and risk of bias and the data collection and extraction were undertaken by two authors for each paper using the standardised Cochrane review tool RevMan. Despite the large volume of clinical data published, the authors were only able to identify four trials fulfilling the inclusion criteria for the study. Of these, two were published trials and two were published abstracts. The review concerned 153 shoulders. The study demonstrated higher functional results in favour of the total shoulders for UCLA (MD 3.10, 95% CI 1.13 to 5.08) and ASES (MD 10.17, 95% CI 1.40 to 18.87) scores. There was no difference in revision rates or incidence of post-operative instability, although the HA was associated with a significantly shorter operative time (39 minutes). Although only a small fraction of the published data is suitable to make a comparison between these two interventions, the post-operative functional outcomes appear to be similar in the short-term follow-up reported by the studies included in this report.⁸ Clearly longer-term follow-up results of the studies already performed are required to tease out the longer-term results, but based on the currently available data, TSA appears the better option for patients with straightforward shoulder OA.

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