review. At the five-year point there were no differences in QuickDASH outcomes, although subjective measures (including a range of motion and radiological parameters) favour the volar locking plate. For the moment, at least, it seems all treatments are equal in the eyes of the DASH score!

Scaphoid arthroscopy under the spotlight

■ In a bumper month for the arthroscopic-assisted hand and wrist trauma RCTs, here at *360* our beady eyes were caught by another such RCT with long-term follow-up. Industrious surgeons in **Lund (Sweden)** report their own randomised study designed to evaluate the efficacy of conservative treatment *versus* arthroscopic-assisted scaphoid fixation. The study cohort consisted of 35 patients, all presenting with minimally displaced or undisplaced fractures of the scaphoid. Curiously for a randomised trial, there was a complete failure of randomisation with 21 conservatively treated patients and 14 treated with arthroscopic screw fixation.[8] Outcomes were assessed at a minimum of four years follow-up, including radiographic and range of motion measurements. The fixation group had a slightly better outcome at 14 weeks, but by 26 weeks the conservative group had overtaken the fixation group. By one year post-injury, there were no differences in range of motion or nonunion rate but there was a slight increase in radiographic arthrosis in the surgical group. So for this initial faster recovery, there is a payback of marginally higher arthroses rates. The cynically minded reader may wonder, with just 14 patients in one group and a clear failure of randomisation, if indeed anything can be drawn from this study at all?

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Shoulder & Elbow

For other Roundups in this issue that cross-reference with Shoulder & Elbow see: *Paeds Roundup 2, 4; Research Roundup 1, 2, 3, 4, 6.*

Culture time important in *propionibacterium acnes*

x-ref Research

■ Infection complications of shoulder surgery are particularly difficult to treat. The most common of these is *propionibacterium acnes*, which is known to colonise the axilla and has been implicated in particularly difficult to treat insidious infections in shoulder arthroplasty. It is known that positive culture rates for *P. acnes* increase with the duration of culture growth, however, it is particularly difficult to culture. The procedure of extended incubation can run the risk of course of lowering specificity.[1] Researchers in **Cleveland (USA)** have set out to establish the diagnostic accuracy of culture, based on time to culture. The researchers hypothesised that early growth might be more significant than later culture. The study team retrospectively reviewed the results of 46 patients, all of whom had presented to their unit with cultures of *P. acnes*, from fluid or tissue taken during revision shoulder arthroplasty. Although gold standards are hard to achieve in this sort of study, the researchers divided their group into probable true positives and probable false positives based on the subsequent clinical course, operative findings and culture results. The chief finding of this study was that in the 37 probable true positive group, the time to culture was significantly shorter (median five days) in comparison with the probable contaminant group cultures, which were positive after 11 days. This study demonstrates that in the case of *P. acnes* cultures, the shorter the time to growth and the higher the proportion of positive cultures, the higher the likelihood of a true positive infection. The number to hang your hat on looks to be 11 days, with no true positive cultures turning positive after this point.

Microvascularisation of the cuff footprint

x-ref Research

■ It is a commonly held orthopaedic belief that vascularisation is key to healing in a range of orthopaedic conditions and interventions. The rotator cuff is no different, and it is believed that the microvascularisation of the rotator cuff tendons is a key determinant in healing of the cuff, both post-tear and post-surgery. Researchers in **Toulouse (France)** considered, not unreasonably, that it may be vascularisation of the bone as much as anything that is responsible for the healing of cuff injuries. In one of those deceptively simple hybrid clinical and basic science studies, the research team followed up 48 patients over a 12-month period who had previously undergone a single-row rotator cuff repair and a full-thickness core biopsy. The cores underwent an immunofluorescent study with staining for anti-CD34 antibodies. The results were correlated with clinical outcomes at 12 months of follow-up. Clinical outcomes included ultrasound (with Sugaya's classification), Constant and ASES scores.[2] As would perhaps be expected, the whole cohort improved in their clinical outcomes, and the research team divided patients according to Sugaya subtypes. It was demonstrated that there was a decreasing rate of microvascularisation for increasing Sugaya classification. Microvascularisation of the rotator cuff tendon is commonly considered as a biological determinant of healing potential, and this study demonstrates that the bone microvascularisation may also play a previously unrecognised role

in dictating healing rates after rotator cuff repair.

Degenerative cuff tears: evidence for repair

■ In a research field replete with studies showing no statistically significant differences, it is reassuring to find that some of the interventions we undertake as orthopaedic surgeons may be beneficial! Despite some studies suggesting equivalent results with cuff tears in the elderly, clinical trialists in **Groningen (The Netherlands)** have undertaken their own randomised controlled trial to establish what, if any, is the benefit of surgical repair of degenerative rotator cuff over conservative treatment. This small-scale randomised controlled trial of 56 patients with a degenerative full-thickness cuff tear allocated patients either to a rotator cuff repair (n = 25) or conservative treatment (n = 31). Outcomes were assessed using the standard Constant Score in combination with VAS pain and disability scores. Outcomes were reported at a year, and although the Constant score favoured the operative group (81.9 *vs* 73.7 points), the difference was insignificant. There were, however, significant differences in pain and disability scores, both favouring operative intervention, right out to the final 12-month follow-up.[3] Prior randomised controlled trials have shown equivalent results with operative and non-operative management of degenerative rotator cuff tears. This study demonstrates a benefit to surgical treatment of degenerative rotator cuff tears with regards to pain and disability at one-year follow-up. Despite its small scale, the patients have been carefully selected and the addition of secondary outcomes of VAS pain and disability measures perhaps explains the positive result here.

Middle ground in distal humeral fractures?

x-ref Trauma

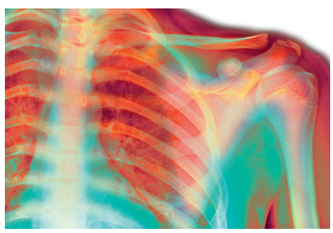
■ The fix or replace argument continues unabated in the case of elderly distal humeral fractures. While in the younger patient the longevity of a total elbow arthroplasty is such that replacement really isn't suitable, it does become an option as patients enter their eighth decade. The advantages of early motion and reliable function may, however, be outweighed in the longer term by risks of loosening and osteolysis. One potential 'third way' is the use of the distal humeral hemiarthroplasty. This technique is starting to gain traction in some quarters and has the advantage of potentially retaining the elbow's native stability and offers early rehabilitation, without the problems associated with later failure (in the case of total elbow) or stiffness and surgical complexity (fixation group). The 'triceps-on' approach to elbow arthroplasty has gained popularity, allowing for rapid early rehabilitation without the risk of triceps avulsion or contracture. There are, however, (to our knowledge) no case series reported of the distal humeral hemiarthroplasty with a triceps-on approach. The upper limb group in **New York (USA)** have reported the first case series. They report the results of their own triceps-on approach in 18 consecutive patients with distal humeral fracture. Although a small series, the authors were able to report the outcomes of the 16 remaining live patients at two years post-operatively. Their reported outcomes included clinical evaluation and functional scoring. At this admittedly short follow-up, the Mayo Elbow (mean score 89.6) and DASH scores (mean of 11.2) were excellent, suggesting a functional elbow. Although there were some signs of wear on the radial head and ulnar articulations in around 50% of patients, there was still an excellent clinical range of pain-free motion.[4] The distal humeral hemiarthroplasty is another option in treatment of these difficult fractures. We are sure here at *360* that this isn't the last we will be hearing of this innovative option.

Haste needed in elbow heterotopic ossification

■ The bane of any serious elbow surgeon's life is the propensity of the joint to stiffen. This is almost unique to the elbow, and a vast array of basic science studies have illuminated the causes of this (a propensity to differentiation of fibroblasts to myofibroblasts seems to be at least partly responsible). However, despite this, there is still little agreement as to the best type and timing of treatments. On occasion, heterotopic ossification can also complicate matters, making decision making surrounding stiffness and other surgery rather challenging.[5] Orthopaedic surgeons in **Shanghai (China)** have set out to establish what is the best time to intervene in treating heterotopic ossification (HO) complicated by elbow stiffness. Like many Chinese papers, there certainly isn't a lack of pathology here and the surgical team were able to review 164 patients, all with post-traumatic HO and severely restricted elbow function. Although this was a retrospective series, the group had been treated with two different surgical protocols; 112 were treated with late excision (mean 23 months) and 52 with early excision (mean six months). These two patient cohorts were compared for functional outcomes (Mayo score) and HO recurrence (Hastings score). There were no differences seen in recurrence rates (both around 27%) and the functional outcomes between the two subgroups. The authors of this valuable paper make the argument that if there is no advantage to waiting, then why not excise the HO early and start physiotherapy before the stiffness has well and truly set in.

Iatrogenic frozen shoulder

■ Frozen shoulder is a tricky little condition to treat. While it may be idiopathic, iatrogenic frozen shoulder is a well described pathology and may complicate even the most simple of arthroscopic procedures. Although well recognised and described, there is little in the way of quantification of the risks associated with arthroscopic shoulder surgery and the risk for frozen shoulder.[6] Investigators in **Exeter (UK)** undertook a simple retrospective study, aiming to establish what the approximate risk was for both arthroscopic subacromial decompression and arthroscopic acromioclavicular joint excision. They describe a consecutive series



of 200 procedures and undertook a thorough notes review with the aim of establishing the incidence of and risk factors for post-operative frozen shoulder. Cunningly, the authors also included a comparator group of 136 patients, all undergoing arthroscopic release for primary idiopathic frozen shoulder. The incidence of iatrogenic frozen shoulder in both groups was around 5% with older patients (aged 46-60), and a previous history of idiopathic frozen shoulder was a significant risk factor. This study helps identify patients at risk of frozen shoulder following operative intervention.

Salvage of failed humeral fixation

x-ref Trauma

■ There are more unknowns than knowns in the treatment of the proximal humerus fracture and it does sometimes seem that with each new paper the problem becomes more and more opaque. The difficulties of how to manage the simple fractured shoulder don't just extend to initial management, there is also a lack of clear direction as to how to manage the complications as well.[7] Failure of surgical fixation is part and parcel of fixing shoulders.

Avascular necrosis, screw cut-out and nonunion conspire to give failure rates of around 10% in many studies (and up to 30% in some). Researchers in **Little Rock (USA)** have shed some light on what outcomes can be expected when managing failed humeral fixation with a reverse shoulder replacement. They report a relatively small series of just 19 patients, all of whom underwent reverse shoulder replacement following a failed fixation. The strength of this paper lies in the care taken in the follow-up. Although small numbers, patients had clinical outcomes assessed with a variety of PROMS and clinical examination in addition to radiographic and RSA follow-up. Outcomes were assessed to an average of three years of follow-up. Although patients were all still compromised to an extent, outcome measures all showed on average a significant improvement (ASES 27.8 to 50.1, VAS Pain 6.8 to 4.3). Crucially, the reverse shoulder yielded a vastly improved range of motion for a cohort of patients who were stiff pre-operatively. Complication rates were understandably relatively high, with around a quarter of patients suffering a major complication. Despite the drawbacks - issues with longevity and potentially high rates of post-operative complications - the reverse shoulder clearly offers a salvage option in appropriate patients following failed internal fixation.

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