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Shoulder & Elbow

X-ref ***For other Roundups in this issue that cross-reference with Shoulder & Elbow see: Trauma Roundup 3; Children's orthopaedics Roundups 3 and 6.***

Is surgery needed for extra-articular scapular fractures?

x-ref

■ We suspect that the rarity of the injury and the technical difficulty of the surgery have a part to play in the decision-making process surrounding fixation, or otherwise, of scapular fractures. The indications for surgery are far from agreed, although the majority of surgeons would concur that for significantly displaced glenoid fractures, surgery should be considered. There is less consensus with extra-articular fractures, although the glenoid can be significantly displaced and this will alter the lever arm and mechanical advantages of the rotator cuff muscles. With a fresh look at what the operative indications in extra-articular fractures ought to be, surgeons from **St Paul, Minnesota (USA)** report the outcomes from their series.[1] The authors were able to report the functional outcomes of 49 of 61 patients with acute operatively managed extra-articular scapular fractures. Functional outcomes were reported to 33 months following surgery, and the authors are open about the operative indications which are well documented in the paper and are based on the limited existing literature. The authors report a 100% union rate, with DASH and SF-36 scores approaching normative values for the population at 33 months of follow-up. Excellent strength and range of motion, compared with the contralateral arm, were also found in the group. There were nine complications apparent in eight patients, with implant removal and secondary manipulation of the shoulder under anaesthesia most commonly seen. The authors concluded that operatively managed displaced glenoid neck and scapular body fractures give expected good functional outcomes. There are two significant limitations to this large series of patients which somewhat hamper the interpretation of the results. Firstly there is no non-operative control group in the study, so there is no evidence to suggest that surgery provides a superior outcome for these injuries. Second, only three patients in this series sustained low-energy trauma. This is not consistent with current epidemiological data that suggest an increasing incidence of low-energy scapular fractures in women,[2] where non-operative treatment may be more appropriate.

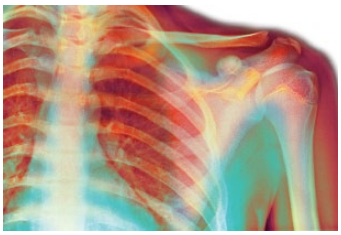
Propionibacterium acnes in primary shoulder arthroplasty: is it a technical surgical issue?

■ In the last edition of *360*, we discussed a paper evaluating the role of single-stage revision shoulder arthroplasty in patients with subclinical infection, where almost half of all revised cases had more than two positive cultures for *Propionibacterium acnes* (*P. acnes*).[3] *P. acnes* is known to be associated with indolent infection leading to osteolysis and loosening of shoulder prostheses, and is of great concern to shoulder surgeons. In this thought-provoking study from Australia, microbiological samples were obtained from a range of potential contaminant sites in 40 consecutive patients undergoing primary shoulder arthroplasty. These authors from **St Leonards (Australia)** [4] designed a study where cultures via swab were obtained from consecutive patients undergoing primary shoulder arthroplasty. In each patient, specimens were taken from the subdermal layer, the tip of the surgeon's glove, the deep scalpel blade, forceps and the skin incision scalpel blade. The study is based on the results of 40 patients, all undergoing shoulder arthroplasty. Of these, one third had at least a single culture positive for *P. acnes*, with 8% of females (n = 2/25) and 73% of males (n = 11/15) having more than a single positive culture. The most common site of contamination was the subdermal tissue (12 positive samples), however, there was a worrying rate of contamination of surgical gloves (seven samples) and forceps (seven samples). Allowing for the difficulties that culture of *P. acnes* poses in the laboratory, it is certainly possible that there were still more positive samples. The authors determined that males had a 66-fold increased chance of having a positive microbiological culture for subdermal colonisation and not unreasonably concluded that *P. acnes* can be found throughout the surgical field. This seemingly ever-present microbe is a persistent problem to shoulder surgeons and, as the team from Australia have suggested, given the high rate of surgeon contamination presented here new approaches are certainly needed to try to reduce the risk of colonisation at the time of primary surgery.

Primary elbow arthroplasty in distal humeral fractures

x-ref

■ The use of primary total elbow replacement (TER) for distal humeral fractures is on the rise but the reasons for this are unclear. Is this trend due to improved surgical results or a change in the pattern of presentation of these fractures? As the number of



elderly complex osteoporotic distal humeral fractures grows, there is an increasing interest in the role of TER for these injuries. In 2009, McKee and the COTS group provided the best evidence (although flawed) to date with their multicentre prospective randomised controlled trial of ORIF *versus* TER for distal humeral fractures in the elderly. The results of this trial were in favour of TER, with more predictable and superior functional outcomes for TER when compared with ORIF.[5] In this registry study from **Los Angeles, California (USA)** utilising the Nationwide Inpatient Sample database, the authors sought to establish what were the trends in the use of TER for distal humeral fractures in elderly patients (⩾ 65 years of age).[6] The study analysed data over a ten-year period from 2002 to 2012. The take-home message from this registry-based study is that there was a 2.6-fold annual increase in the use of TER for these injuries. Surgery accounted for 13% of surgically managed distal humeral fractures in 2012, a significant increase from the baseline value of 5.1% seen in 2002. In terms of overall costs, TER was over $16,000 more expensive than ORIF. Interestingly, the authors comment that, given the 'complexity, long-term restrictions and risks associated with TER', this increasing trend needs to be monitored closely. Here at *360*, we would echo the conclusion of the COTS group's study that arthroplasty is really only a preferred treatment method in these elderly patients when the complexity of the fracture means that stable fixation is not attainable. The rise in the use of TER highlighted in this study seems likely to be related to the rise in the number of osteoporotic distal humeral fractures, meaning that TER needs to be utilised on an increasing basis. However, most would agree that the indications and long-term outcome of TER for trauma are still to be fully defined, especially for an intervention reported to cost in excess of $85,000.

How 'terrible' is the Terrible Triad? x-ref

■ A terrible triad fracture-dislocation of the elbow is a complex injury, which is 'terrible' due to the noted potential for post-operative instability and stiffness. Classically said to involve the radial head, coronoid and lateral ligament complex, the 'terrible triad' presents as a combination of significant soft-tissue disruption and instability. Nonetheless, improved results in the literature have been documented, particularly since the well cited standardised surgical protocol on how to manage these injuries was put forward by the team in **Toronto (Canada)**.[7] This approach focuses on the fixation or replacement of the radial head, fixation of the coronoid where possible and repair of the lateral collateral ligamentous (LCL) complex. In this retrospective cohort study from the groups in **Boston, Massachusetts and Austin, Texas (USA),** the authors aimed to establish the reason for this treatment protocol's success.[8] The study revolves around the results of 107 patients, all of whom underwent surgical management for a terrible triad injury (TTI). The patients themselves were assessed for subsequent recurrent instability using radiographic evidence of subluxation of the ulnohumeral joint as an endpoint. The authors determined that 93% of patients had no eventual radiographic evidence of instability, with just 2% of patients having evidence of the so-called 'drop sign' that was successfully managed with active exercises. Of the 5% of patients presenting with recurrent instability following fixation, 3% were successfully managed within two weeks of injury. The authors concluded that with early surgery within two weeks of injury, involving repair of the LCL and replacement of the radial head, there is a very low rate of recurrent subluxation/dislocation. For patients managed after this period, supplementary stabilisation, such an external fixator, may be required.

Interscalene block better than we thought?

■ In a very interesting study from **Seoul (South Korea),** clinical trialists put to the test the hypothesis that a single-dose interscalene block would not only improve analgesia following a rotator cuff repair, but that there would be measurably lower pain and stress response biomarkers – a tall order.[9] They designed their randomised controlled trial to test a single-dose interscalene block and general anaesthesia against general anaesthetic only. Outcomes were assessed at 48 hours as this is an early pain control study with both a VAS pain score and measured biomarkers (insulin, dehydroepiandrosterone sulfate (DHEA-S), and fibrinogen). The study reports the outcomes of 62 patients randomised to one of the two interventions, and outcomes are reported at 18, 42 and 66 hours post-operatively. All of the patients had a 1 cm to 4 cm rotator cuff tear, and, perhaps not surprisingly, the VAS pain scores were significantly lower in the block + general anaesthetic group when compared with the general anaesthetic alone group (2.5 *vs* 3.8) across the whole day. This difference was most marked at six hours post-operatively (2.4 *vs* 4.2). Perhaps more unpredictably, this improved pain control had a marked difference on the biomarkers measured, with significantly lower insulin levels in the intervention group (10.6 μU/mL *vs* 20.4 μU/mL). There were, however, no differences in the DHEA-S or fibrinogen levels between the groups. This study raises some interesting questions for study design, as well as reinforcing the value of regional analgesia in post-operative pain control in shoulder surgery. The authors here have not only been able to identify a treatment effect, but also shed some light on the biological implications for this. A hard demonstration of reduced insulin levels following surgery with a block may help to explain the stress response, and in particular what some of the drivers for this may be.

Open and arthroscopic rotator cuff repair comparable x-ref

■ Although the standard in most centres worldwide is arthroscopic treatment of rotator cuff repairs, there remains much debate about not just the indications, but also the operative technique and efficacy of rotator cuff repairs. The team in **Oxford (UK)** have set out to add another piece to this increasingly complicated jigsaw puzzle.[10] Their randomised controlled trial compares open and arthroscopic rotator cuff repair for patients with degenerative cuff tear arthropathy. The UKUFF study has now reported and 273 patients were successfully enrolled, 136 to arthroscopic surgery and 137 to open surgery. The outcomes were assessed at two years post-operatively with (perhaps predictably) the Oxford Shoulder Score as the primary outcome measure. Overall, there were significant improvements in outcomes between baseline and two-year follow-up, and the authors were also able to report that both the arthroscopic (26.3 to 41.7) and open (25 to 41.5) subgroups had a significant improvement in their Oxford Shoulder Scores. There was, however, no difference between the groups at all. There were no differences in surgical outcomes, either in terms of re-tear rates, or complications. Perhaps unsurprisingly, those patients with healed tears had the most improved surgical outcomes. This study adds a lot to the literature. It is one of the only intervention studies to randomise patients to different techniques, and it can be incredibly difficult to recruit to these studies. The results of this study are, nevertheless,

conclusive; the only difference between the groups was the surgical approach. Both showed significant improvements over baseline, and both had a similar outcome.

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Spine

***X-ref** For other Roundups in this issue that cross-reference with Spine see: Oncology Roundup 1; Children's orthopaedics 4*

Walk off your decompression

Decompression of lumbar stenosis is a common operation, one on which many training spinal surgeons will cut their teeth. The outcomes are rather tricky to assess, and a whole range of objective and subjective measures are in widespread use for clinical and research purposes. These outcome measures are often difficult to administer, somewhat lengthy and can be a significant time burden on patients and clinicians. Salvation may well have arrived in the form of a simple robust test to assess the effectiveness of lumbar decompression. Although several walking tests have previously been described in monitoring spinal stenosis, a group from **Oswestry (UK)** have used the maximum walking distance as a measure of spinal stenosis symptoms and attempted to utilise differences in the function of a patient before and after surgery as a measure of operative success.[1] This study reports the measure in a group of 76 patients, all presenting with an MRI-proven diagnosis of spinal stenosis, who were surgically treated. The study team assessed their maximum walking distance before surgery and again immediately, and at three months, post-operatively. Furthermore, the authors followed up their cohort for at least 6.3 years. The results showed that mean walking distance (which the authors termed 'self-paced walking test' (SPWT)) increased from 78 to 1285 metres, with two thirds of patients exceeding 2000 m following surgery. Over 95% of patients had a statistically significant increase in SPWT. In the longer term, 8% had undergone revision surgery by eight years and 35.5% reported some residual leg symptoms at the end of follow-up. The authors found that having a greater pre-operative intervertebral disc height and being male was associated with a greater increase in SPWT, and that, overall, surgery improves functional walking in the vast majority of patients. The series is probably reasonably generalisable, however, all of the operations were performed by a single surgeon and the authors admit to a high threshold for surgery in lumbar stenosis. The SPWT is perhaps a simple and useful way to assess the functional improvement following decompression. However, it would have been nice to have a more comprehensive statistical analysis and a formal validation of the tool. The SPWT is simple, reliable and hard to get wrong. It might well be useful in assessing the effectiveness of surgery, and we should probably make a point of asking walking distances when following up with patients. It would be nice to see a formal validation of this approach against some of the more traditional outcome measures.

Could denervation succeed where surgery has failed?

We've heard it said that 'every subspecialty has its back pain'. In spinal clinic, the back pain is the 'back pain'. It's no secret that back pain can be a challenge to treat and that patients can return many times before a solution is found, if ever. The combination of chronic pain, somatisation and functional overlay, along with a range of recognised organic pathologies, presents a challenging diagnostic and treatment test. A group in **Vienna (Austria)** may well have come up with a useful new precision approach to the treatment of back pain with the ablation of the basivertebral nerve at the level of the affected vertebra.[2] Although industry-sponsored, this study used radiofrequency ablation to target the basivertebral nerve which enters the vertebrae through the vascular channel on the posterior wall. This small cohort of 17 patients, each presenting with back pain present for more than six months and unresponsive to conservative measures, were identified as participants for the study. Each patient underwent discography and an MRI scan demonstrating Modic I or II changes at the affected level to confirm the source of the pain. Patients underwent ablation and were then reviewed at three, six and 12 months. The authors established that pain and disability levels were all improved by a clinically significant amount at every follow-up point after this procedure. This conclusion must be considered within the context of this being an industry-sponsored investigation with no control group and restrictive inclusion criteria. Taking a sensible approach, the generalisability of this work to everyday practice is limited, however, this is an interesting concept and we look forward to seeing further work in this area.

Straightening out pain following fusion for adolescent idiopathic scoliosis

Surgery for adolescent idiopathic scoliosis (AIS) is one of the more painful procedures that orthopaedic