measurements and clinical assessment. Further assessments at six and 24 months have been undertaken. While 16% had ulnar pain at three months, this decreased to 8% at six months and just 2% at 12 months; none of these patients wanted treatment. The pathophysiology is not quite clear, and could be due to the ulnar head impacting into the carpus as the radius has shortened. The distal radioulnar joint may be incongruous due to tilting of the distal radius. If we consume resources and organise an MRI scan, we may well see some signal disruption in the margins or centre of the TFCC. But do these need treating? Our clinical experience matches that in Korea; if we wait rather than intervene too early, it is suggested that the pain may well settle. So the message is clear - avoid early scans, osteotomies and arthroscopies. Use good old-fashioned time and reassurance instead.

Fixation of the ulnar styloid fracture X-ref

■ Hot on the heels of the Seoul experience of ulnar-sided wrist pain following distal radial fracture is an article from **Nagoya (Japan)** exploring the question of whether the ulnar styloid fragment needs fixing in distal radial fractures.[6] These authors comment that significant controversy surrounds treatment of the ulnar styloid fragments. They report their experience of a case-matched series with 3:1 matching. Their 16 patients, who underwent radial and ulnar styloid fixation, were matched to 48 patients who did not undergo fixation but were matched for fracture pattern, age and sex. Outcomes were assessed in terms of a range of radiographic measures and clinical scores. Perhaps unsurprisingly, there were no differences in the radiographic or clinical parameters that the authors measured as part of the study. They were able to say that the chances of radiographic union are higher. Putting these two studies together, it seems sensible to watch and wait, and allow nature to take its course with ulnar-sided wrist pain after fixation of a distal radial fracture.

Even Michelangelo had arthritis in his hands!

■ Michelangelo, the Renaissance master who produced some of the most sublimely beautiful and famous pieces of art, not least of which are the iconic hands of God and Adam ('The Creation of Adam', Sistine Chapel, Vatican City), had arthritis in his hands. In 1552, he wrote to his nephew that "writing gives me great discomfort...." Collaborators in **Florence (Italy)** and **Sydney (Australia)**[7] studied three portraits of Michelangelo himself, aged between 60 and 65 years. They each show his left hand, suggesting he was left-handed. The hand displays the typical squaring of the thumb trapeziometacarpal joint, with lesser changes in the thumb metacarpophalangeal joint and interphalangeal joints, as well as the proximal interphalangeal joint of the index finger.

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Shoulder & Elbow

X-ref ***For other Roundups in this issue that cross-reference with Shoulder & Elbow see:*** *Research Roundup 3.*

Reverse shoulder arthroplasty: the key is in the greater tuberosity X-ref

■ This study further highlights the increasing use of reverse total shoulder arthroplasty (rTSA) for complex fractures of the proximal humerus, which was featured in a paper discussed in the last edition of *360*.[1] This multicentre retrospective study from **Zürich (Switzerland)** reports the use of rTSA for the more complex head-splitting three- and four-part proximal humeral fractures.[2] The authors were able to gather together a series of 51 patients with a mean age of 77 years who were analysed at a mean of three years following acute reverse total shoulder arthroplasty (RSA). Outcomes were assessed using the Constant score and the subjective shoulder value (SSV), both administered at a single follow-up point with patients achieving, on average, 86% of the shoulder function on the other side. A total of 92% of patients rated their management as excellent or good, with overall satisfaction levels high at 93%. Although no intra-operative complications were recorded, of the original 73 patients, four underwent revision surgeries: one periprosthetic humeral fracture, one post-operative haematoma and two infections. An inferior outcome was associated with secondary displacement of the greater tuberosity (GT) when compared with those with a GT that was radiographically united. The authors concluded that rTSA is a sound treatment modality for these difficult and challenging cases, while also suggesting that revision surgery may be indicated for secondary displacement of the GT, although this statement is made without a comparison. This study is one of the largest in the literature reporting on this topic for managing acute complex proximal humeral fractures in elderly patients, where the indication for the reverse implant could be on the rise; utilisation certainly is.

Shoulder arthroplasty may improve the driving performance of patients

■ It must be one of the most common questions asked by a

peri-operative patient: *When can I get back to driving?* Despite this, there is very little detail available to inform these decisions, with advice routinely given with caution and a lack of data! This elegant study from **New York, New York (USA)**[3] caught our eye at *360* HQ as it addresses this simple question. The investigators used a driving simulator to assess 30 patients, all of whom underwent shoulder arthroplasty surgery (20 anatomic and ten reverse). Patients were assessed pre-operatively and at two, six and 12 weeks post-operatively by analysing a variety of characteristics including total number of collisions and off-road excursions, as well as VAS pain score and the Shoulder Pain and Disability Index (SPADI). Despite the mean number of collisions increasing at week two, as would be expected, driving performance returned to pre-operative levels by six weeks and patients performed better than pre-operatively at 12 weeks post-surgery! Multivariate analysis found that poorer VAS pain scores, increasing age and less driving experience were predictive of a poorer driving performance. The authors concluded that clinicians can suggest a six- to 12-week window post-surgery that can be used for a gradual return to driving, with this being closer to 12 weeks for older patients or in those with less driving experience or higher pain levels. These findings are consistent with a recent paper reporting on driving performance post-arthroscopic shoulder surgery,[4] which reported impaired driving performance for a minimum of six weeks post-surgery and a return to normal driving by 12 weeks.

The debate regarding early fixation of acute clavicle fractures continues X-ref

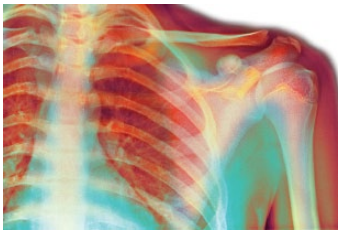
■ It seems seldom that a major orthopaedic trauma conference goes by without the presentation of another well performed randomised controlled trial comparing non-operative and operative management for acute displaced mid-shaft fractures of the clavicle. Despite some excellent prospective trials and subsequent meta-analyses, the debate continues.[5,6] The clavicle is perhaps the one clinical problem that won't be resolved with randomised trials alone. This large study from **Los Angeles, California (USA)** using the American College of Surgeons' National Surgical Quality Improvement Program database compared registry data from a total of 1215 patients who underwent open reduction internal fixation (ORIF) for either an acute mid-shaft clavicle fracture (n = 1006) or a clavicle mid-shaft nonunion (n = 209).[7] The primary outcome measure in this study was the 30-day complication rate. The authors reported an increased rate of complications following nonunion surgery (5.26% *vs* 2.28%) and they subsequently undertook a multivariate analysis in order to establish the predictors for complications. The authors established that there was a two-fold increased risk of all complications in patients with a nonunion, with a three-fold increased risk of wound complications. Interestingly, the authors conclude that these findings should be considered when making definitive management decisions for patients with these injuries. However, given that it has been shown that 6.2 patients would need to undergo surgery to prevent one nonunion, others have suggested that more work is required to identify fractures at risk of nonunion and it is these patients who would be best considered for early surgery.[8]

Surgery is successful for refractory medial epicondylitis in the longer term

■ The role of surgery for medial and lateral epicondylitis of the elbow continues to be debated, as does pretty much every other aspect of management. This confusion is likely to be due in part to the heterogeneous nature of some of the series which have been reported, and the natural relapsing remitting history of the condition, making firm conclusions difficult to draw. Most surgeons would, however, agree that surgery may be of benefit when it is reserved for refractory cases. In this single-centre single-surgeon retrospective case series from **Gyeonggi (South Korea)** the authors report the outcomes of 55 patients treated with 63 cases of medial epicondylitis.[9] All patients underwent non-operative interventions prior to consideration for surgery, including treatment for a minimum of one year with at least two steroid injections (a mean of five). At an average follow-up of seven years following surgery, the authors report a significant improvement in the mean visual analogue scale score, grip strength, Mayo Elbow Performance score and the Disabilities of the Arm, Shoulder and Hand score. The post-operative recovery was substantial, with the time to return to work just shy of three months and return to exercise at around five months. The overall reported success rate was 93%, with the Nirschl and Pettrone grades rated 43% as excellent and 51% as good. There was a single case of heterotrophic ossification. This study provides good long-term results supporting the use of surgery for refractory cases of medial epicondylitis of the elbow. We would suggest, here at *360*, that this study highlights the importance of emphasising to patients the possibility of a prolonged recovery period[10] after such surgery, with patients requiring an average of almost three months off work.

Further evidence to suggest corticosteroid injections are not beneficial in the management of tennis elbow

■ There is now a strong body of evidence to suggest that corticosteroid injections are not beneficial in the long- or short-term management of enthesopathy of the extensor carpi radialis brevis, otherwise known as 'tennis elbow'. This large meta-analysis from a team in **Boston, Massachusetts (USA)** included



seven randomised controlled trials (RCTs) identified following a thorough search of the indexed literature.[11] All seven included trials compared the effect of corticosteroid injection with a placebo injection on the symptoms of tennis elbow. The authors reported no difference in outcomes between steroid and placebo in terms of pain at three and six months following injection. However, they did report marginal but significantly reduced pain levels at one month post-injection. Grip strength and the Disabilities of the Arm, Shoulder and Hand scores were comparable at all of the time points analysed. Given these findings, the authors concluded that steroid injections for tennis elbow are 'neither meaningfully palliative nor disease modifying'. This adds further weight against the use of steroid injection for this common condition, with an additional study from this group suggesting that the use of steroids was associated with an increased rate of surgery for the condition.[12]

Muscle atrophy and fatty infiltration in rotator cuff tears: can surgery stop muscular degenerative changes?

■ If a rotator cuff tear is left untreated, the natural progression is the secondary development of dysfunction of the cuff musculature, usually the supraspinatus muscle. This is part of the development of a 'cuff tear arthropathy'. Subsequent management of cuff tear arthropathy is complex, with poor functional outcomes and development of secondary arthroses in the joint, although recently reverse total shoulder arthroplasty has been introduced. The question of course has always been: *how does the pathophysiology*

relate to surgical intervention? Is the die cast at the time of injury? Surgeons from **Rome (Italy)** have reported their study of 41 patients, all with an MRI-proven rotator cuff tear.[13] Although the study was retrospective, the authors were able to identify two subgroups: those who had undergone rotator cuff repairs and those who had not. Outcomes were assessed using a range of shoulder outcome measures and an interval MRI scan at 50 months following diagnosis. The authors established that there were better results in terms of fatty infiltration of the muscle belly in the operative group with no progression of fatty changes, while the non-operative group had significant increases in tendon retraction and tear size. Although this doesn't establish causation, it does provide some evidence to suggest that tendon repair is able to prevent secondary muscle degeneration.

Anterior plating stronger in the clavicle? X-ref

Historically, clavicle fractures have been plated with a superior approach. Though sigmoid-shaped, the flat surface of the superior aspect of the clavicle allows for easy application of the plate without multiplanar contouring. There is, however, an incidence of metalwork failure. Some fracture patterns are less amenable to superior plate placement; following failure of fixation the best surgical fixation option may be an anterior plate. These authors from **Baltimore, Maryland (USA)** explore the benefits or otherwise of anterior plate placement in lateral clavicle fractures.[14] They designed a cadaveric study that tests the hypothesis that reorientation of the plates to move the screw line away from the axis of the deforming forces would improve the biomechanical strength of the construct. The authors used six pairs of fresh frozen cadavers and undertook standardised osteotomies with superior and anterior plating, prior to mounting them on an Instron machine and loading with 375 N at 1 Hz for 2000 cycles. Following this, sequential loads to failure were tested. There were significant differences in all measures of biomechanical stability, with the most marked difference being in load to failure (587 N *vs* 375 N) in favour of anterior plating. The authors found that anteriorly plated distal third clavicle fractures have superior strength and durability when compared with fractures plated superiorly in a cadaver model. Clearly there are some limitations to this study. There are few clinical studies, however, from which to base treatment decisions, and their findings are important.

Optimising treatment in olecranon bursitis

As a mostly non-operative diagnosis, olecranon bursitis has been somewhat neglected on the research front over the past decade, with little progress made in treatment despite the comparative frequency of presentation. We were delighted to see this randomised controlled trial from **Seoul (South Korea)**, testing three treatments: compression bandaging and NSAIDs *versus* steroid injections *versus* aspiration.[15] They report the outcomes of 133 patients randomised to one or other treatment and reported at four weeks' follow-up. Outcomes were assessed as resolution at four weeks and median time to resolution. Sadly this study did not detect any differences between the three interventions, although the study was only powered to detect a 30% difference. The authors sensibly suggest that this study should be regarded as a pilot, and a large study capable of detecting a greater difference should be undertaken.

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Spine

X-ref ***For other Roundups in this issue that cross-reference with Spine see:*** *Children's Orthopaedics Roundup 4; Research Roundup 4.*

Cement or screws? X-ref

All spinal surgeons have felt the grip of disappointment when reviewing post-operative radiology and spying loose pedicle screws or loss of correction - an effect heightened in osteoporotic fracture. The potential likelihood for revision surgery and all its accompanying misery leads us to despair. However, help could be at hand. A team from **Göttingen (Germany)** has conducted a cadaveric investigation into the effect of cement-augmented pedicle screws on the fatigue strength and cyclical failure of pedicle screws used in short and long segment fixation in osteoporotic fractures, compared with non-augmented screws in long fixation.[1] Although their investigation was cadaveric, should it be successful there may be important messages in this study for clinical work in the osteoporotic spine. In their study of thoracolumbar spines, the authors instrumented with either short (single vertebra) or long (two vertebrae) fixation, with one side being augmented