

ROUNDUP³⁶⁰

Wrist & Hand

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Scapholunate instability: decision making

■ In perhaps one of the more clinically useful papers included in this edition of 360, researchers in **High Wycombe (UK)** provide help for all involved in the diagnosis and management of the difficult entity that is scapholunate ligament injury. Fundamentally, these injuries form part of a continuum from ligament sprain to multiligament carpal instability. The key to success is trying to work out when a wrist injury will progress to scapholunate advanced collapse. The authors of this informative article argue conclusively that while assessment and classification of scapholunate instability is well defined, there is still an ongoing search for evidence of the management of scapholunate instability in the absence of arthritis. They were unable to find any strong evidence to support a particular management strategy, and published guidelines are largely experience-based. The authors argue that accurate grading is important in forming a management strategy. They highlight the need for dynamic or stress views or those patients presenting with 'dynamic' instability may be missed. The current body of evidence suggests that lower grade injuries (Geissler arthroscopic grade 1 and 2) are unlikely to lead to chronic symptoms and should be left alone. Higher grades of injury seem more

likely to progress and the outcomes may be improved through soft-tissue stabilisation. Most difficulties come through failure to diagnose correctly, chiefly through misinterpretation of pre-existing hypermobility which, combined with a complete lack of robust evidence to support any particular management, makes the spectrum of scapholunate instability a potential quagmire waiting to catch out the unwary.¹

Scapholunate instability: three-ligament tenodesis

■ Weighing in with some further evidence, surgeons in **Nancy (France)** have shared their experience of treating scapholunate instability with a dynamic 'tri-ligament reconstruction'. The authors describe a complex technique using a flexor carpi radialis three-ligament tenodesis. The study team report the results of a series of 20 patients prospectively treated and followed up for over 25 months. The case series consisted of both dynamic and static cases of scapholunate instability. Across the whole group, the three-ligament tenodesis relieved pain significantly and increased grip strength and wrist function at the expense of joint stiffness. However, the authors found little improvement with dynamic instability cases and recommend an easier technique such as capsulodesis or even non-operative management. Despite the improved clinical scores, the authors' concern over the high complication rate and failure to reduce the scapholunate diastasis significantly, they have changed to

an intercarpal fusion (scaphocapitate arthrodesis).² It is refreshing to see this paper. The tri-ligament tenodesis is a demanding technique and this honest article highlights many of the problems that surgeons face trying to replicate the results of a tricky surgical technique in a less common pathology.

Pronator quadratus: to repair or not?

■ As volar plate distal radial fixation becomes a more common procedure, there are more and more papers published concerning the nuances of the procedure. There is little in the way of comparison between different surgical techniques in the literature – the majority of surgeons are still grappling with the decision of which fractures to fix, let alone the nuances of which to treat. Undeterred by multiple randomised studies which have shown little or no benefit of volar plating over other treatment modalities in distal radial fractures, researchers in **Philadelphia (USA)** designed a randomised controlled trial with the aim of establishing the treatment effect of repair of the pronator quadratus. The study team recruited 60 consecutive distal radial fractures treated with a volar plate. Patients were randomised to either repair of the pronator quadratus or not. The standard care for operative approach and post-operative rehabilitation was the same in both groups. Clinical outcomes were assessed at a year, and included range of movement, grip strength, DASH scores and VAS

scores.³ In case you ever wondered, in this randomised group of 60 patients undergoing volar plate fixation of distal radial fractures, pronator quadratus repair did not significantly improve post-operative range of movement, grip strength or DASH scores at one year. However, we find it intriguing that pronation strength was not even measured.

Proximal row carpectomy: successful at 20 years

■ With poor results from arthroplasty and difficulties with stiffness associated with selective or complete wrist fusions, the humble proximal row carpectomy has garnered a loyal, but relatively small following. There is little in the way of long-term follow-up data, but proponents argue that the joint preserving operation may have some significant benefits in the longer term. The surgical team in **St Louis (USA)** have been performing proximal row carpectomy (PRC) as a movement-sparing option for degenerative disorders of the proximal carpal row for over 20 years. Noting that previous studies have demonstrated acceptable ten-year follow-up with maintenance of strength and movement, they set out to establish the outcomes of PRC in terms of satisfaction and function at 20 year follow-up. Although a small series of just 17 wrists in 16 patients, the authors were able to follow them up to an average of 36 years (minimum 20). The patients were from a mixture of backgrounds but seven were manual workers. All patients underwent

PRC for degenerative conditions of the proximal carpal row. Patients were followed up with radiographs, clinical evaluation, and the Quick-DASH and Patient-Related Wrist Evaluation (PRWE). By the 20-year follow-up point, 11 wrists (65%) had undergone further surgery, with the majority (six) undergoing radiocarpal arthrodesis at a mean of 11 years (1 to 20). The remaining ten patients who did not undergo radiocarpal arthrodesis continued to be satisfied, with very similar movement and grip strength scores compared with the contralateral side. At final follow-up, the mean scores were QuickDASH 16, PRWE 26 with a flexion-extension arc of 68°, and grip strength of 72% of the contralateral side. Interestingly, although many patients showed radiographic degenerative changes, there was no correlation with satisfaction level.⁴ There are few procedures in orthopaedics with follow-up beyond ten years. It is heartening to see that many patients receive long-term benefits from joint preserving PRC.

FPL dysfunction common after volar plate fixation

■ In what must be a record two-month period for research into distal radial fracture fixation, researchers in **Chicago (USA)** undertook an interesting investigation into thumb flexor dysfunction following a surgical approach for fixation of a distal radial fracture with a volar plate. The study team set out to establish the incidence of flexor pollicis longus (FPL) function after volar plate fixation of distal radial fractures. The research team recruited 46 patients to a retrospective investigation to examine FPL function post-operatively. Of the 46 patients, 24 exhibited loss of thumb IP joint flexion compared with 22 who had full IP joint flexion. Patients were seen at regular intervals, during which there was full recovery of IP joint flexion and the fractures were completely healed. There were no differences in demographics, fracture pattern, surgical variables (including incision

length, plate length, operative time and plate configuration) or final reduction between the two groups. The group with inhibited IP flexion returned to normal at a mean of day 52 (19 to 143). There was, however, a mean 11° loss of flexion between the two groups. The authors also conducted a cadaveric investigation to try and explain their findings. They found that excursion of the FPL tendon decreased with sequential



soft-tissue dissection and retraction.⁵ It certainly appears from these results that loss of active IP flexion following distal radial plate for volar fractures is common. While the majority of cases appear to return to normal within two months, there are certainly a number of cases who take up to five months to recover. Analysis of the cadaveric dissections suggested that “partial stripping of the flexor pollicis longus muscle from investing fascia and bone and retraction of soft-tissues are likely etiological factors.”

Locating the thenar branch of the median nerve

■ In a deceptively simple but extremely useful paper, researchers from **New York (USA)** have described and validated a simple method for accurately identifying the location of the thenar branch of the median nerve. The researchers used 41 cadaveric hands, and dissected out the thenar branch of the median nerve. The authors describe a new technique for easy

identification of the location of the nerve. The study team passively flexed the middle finger to 90° at the metacarpophalangeal and proximal interphalangeal joints, with the distal interphalangeal joint in neutral. This allows the fingertip to contact the thenar eminence. Across all 41 specimens, the mean distance from the centre of the tip of the middle finger to the origin of the thenar branch of the median nerve was 1.9 mm ulnar and 0.9 mm proximal to the tip of the flexed middle finger. There were cases of transligamentous nerve branches.⁶ This is an extremely simple method for identifying the thenar branch of the median nerve to within 1 mm without the need to rely on secondary landmarks: a simple but useful study.

Metallosis CMCJ arthroplasties?

■ Metallosis is more in vogue than vogue itself in the orthopaedic press. A sure-fire publication in the hip world or popular press, almost every angle has been covered. However, we were amazed to find a fresh angle being taken by researchers in **Holstebro (Denmark)**. Noting that many of the trapeziometacarpal joint replacements are in fact metal-on-metal articulations, the research team set out to measure the serum chrome and cobalt values in patients who had undergone a total trapeziometacarpal total joint replacement with either a metal-on-polyethylene (23 patients) or a metal-on-metal articulation (50 patients). Around 20% (n = 10) of patients with metal-on-metal articulation had measurably elevated serum chrome or cobalt values. In the metal-on-polyethylene group there was only a single patient (4%) with raised metal ion levels. Every patient had metal ion levels that were lower than the accepted ‘normal’ values when monitoring patients with a metal-on-metal hip replacement. The authors noted poorer clinical DASH scores in patients with mildly elevated metal ion levels (24 *versus* 10). The authors argue that this

represents a local clinical effect of raised metal ions. They suggest, based on their results, that “patients with trapeziometacarpal total joint replacement with metal-on-metal articulation are followed with DASH score and radiological examination every 3 to 5 years”.⁷ This is a curious conclusion. While the authors have noted mildly increased metal ion levels in one in five patients, they are very far from establishing causation. With such small numbers of patients it is equally possible that the outcomes are explained by a different clinical outcome from the different prostheses.

Timing of flap reconstruction

■ The complexities associated with microvascular flap reconstruction of soft-tissue defects in the upper limb often causes logistical issues with getting rapid soft-tissue coverage. The recommendations as to timings for coverage are variable, as are the recommended flaps. Historically, soft-tissue reconstruction has been suggested optimally to take place within 72 hours of injury. There has been a general shift away from this doctrine, with surgeons happier to delay soft-tissue coverage. It is unclear if this is based on evidence or convenience. Researchers in **Dallas (USA)** conducted a structured review of the literature to establish if this is an evidence-based approach. The review team conducted a thorough review of the literature published between 1995 and 2011 using the major medical databases (Medline and Scopus). Searching was performed by keywords initially and articles then screened for relevance. The study team aimed to establish outcomes through use of flap failure, infection, length of stay and non-union as tangible outcome measures. The research team were able to identify 15 scientific articles that fulfilled their inclusion criteria. There were no significant differences to be found between earlier and later reconstructions, particularly with regards to flap loss, infection and non-union. Unsurprisingly, patients

with later flap reconstruction did, however, undergo longer hospital stays.⁸ The authors conclude that the current body of scientific evidence does not point to an advantage in terms of patient outcomes for emergent, early or delayed surgery. However, earlier flap coverage is associated with shorter hospital stays, which in itself is likely to limit total costs of care.

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