

early failure in total ankle arthroplasty. This study is designed to establish the effects of ankle implantation in varus, valgus, and neutral alignment on overall prosthesis survival. In this study, these authors from **Gwangju (South Korea)** studied the outcomes of 144 consecutive ankles, who all had a primary total ankle arthroplasty using the mobile-bearing HINTEGRA prosthesis.⁷ This patient population was then subdivided based on preoperative deformity. There were 59 ankles in the varus group (5° to 20° varus), 34 ankles in the valgus group (5° to 20° valgus), and 51 ankles in the neutral group (<5° varus or valgus). There were no obvious differences in between groups in terms of baseline demographic characteristics. The authors collected a myriad of outcome measures, including the

Ankle Osteoarthritis Scale pain and disability score, American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot score, 36-Item Short-Form Health Survey Physical Component Summary score, visual analogue scale score for pain, and ankle range of movement. None of these differed meaningfully between the different preoperative groups. The authors then went on to analyze the groups by final postoperative coronal alignment. There were significantly more concomitant procedures in the varus group than in the neutral group, and there were some differences in overall probability of implant survival, which was 98% in the varus group, 81% in the valgus group, and 91% in the neutral group at just over seven years of follow-up. The authors have demonstrated in this moderate-sized series that, if postoperative alignment is good,

there is no effect on mid- and long-term results. This paper is valuable, in that it clearly demonstrates that if ankle alignment can be corrected post-surgery, this is more important than preoperative alignment. This, of course, makes perfect sense from the biomechanical standpoint. The question is in which ankles with preoperative deformity a neutral postoperative alignment can be achieved.

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Wrist & Hand

Is it cost-effective to image scaphoid fractures?

■ The management of patients with suspected scaphoid fractures is problematic, in part due to the limited sensitivity and low negative predictive value of conventional plain film radiographs. The reported incidence of fracture in patients with a suspected injury varies, but is typically low, at around 15%. Undiagnosed injuries can lead to significant complications that we are all familiar with, such as nonunion, avascular necrosis, and secondary wrist arthritis. False-positive diagnoses also incur the financial costs and morbidity of unnecessary treatment. In this systematic review, the authors from **London (UK)** examine the role of additional imaging for the suspected scaphoid fracture.¹ MRI and CT scanning have been used to diagnose these injuries more

accurately, with varying success; the most recent National Institute for Health and Care Excellence (NICE) guidance on Fractures (Non-Complex) suggests that one should consider MRI as first-line imaging for the suspected scaphoid fracture. This review addresses the issue of cost, describing the spectrum of economic evaluations, from simple monetary cost analysis through to incremental cost-effectiveness analysis, which considers both the monetary costs and the outcomes (and thus the costs associated with both poor and good outcomes). The authors note that there were few full economic evaluations performed that fulfilled their inclusion criteria, and, as such, conclusions are incomplete. The authors were able to include 15 studies in their analysis; however, direct comparison was difficult due to different outcome measures being

utilized. The conclusions of the included studies varied, with one finding no cost difference with use of advanced imaging, one demonstrating favourable cost evidence, and three demonstrating unfavourable evidence; this variation was likely due to differing methodology. Given that the follow-up concluded at 42 days in one study, which was perhaps too early to capture all missed scaphoid fractures, it seems doubtful that the cost evaluations are sufficiently robust. Considering the relatively low incidence of actual scaphoid fractures, there is clearly a grey area here. The balance between a scaphoid fracture being missed, on the one hand, and large numbers of patients undergoing negative and ultimately unnecessary scans, on the other, needs to be addressed. From a societal cost perspective, there appears to be a benefit to early

advanced imaging. However, when considered from the point of view of cash-strapped health systems, there is no robust economic evidence to suggest advanced imaging is cost-effective. As the authors have recommended, well-designed economic impact research is required to establish whether the financial costs incurred as a result of performing advanced scaphoid imaging on every patient with post-traumatic radial-sided wrist pain are justified.

Wrist inflammation: a retrospective comparison between septic and non-septic arthritis

■ Wrist joint inflammation is a relatively common problem with multiple possible causes, one of the more serious being septic arthritis. There is, however, much overlap in the clinical presentation of septic and non-septic

causes of wrist joint inflammation. Physical examination, inflammatory markers, and imaging studies are often unable to differentiate between these causes. Given that early intervention for septic arthritis is key, and that septic arthritis is best treated with surgical debridement and joint lavage, a positive or negative early diagnosis is important. This obviates the morbidity of intervention in non-infective cases that are best treated conservatively. Researchers from **Singapore** looked at their series of patients with suspected wrist joint inflammation over a 36-month period to identify discriminative factors that might differentiate septic arthritis from non-septic wrist inflammation.² A total of 181 patients with acute wrist inflammation, septic wrist, gout flares, osteoarthritic flares, inflammatory arthritis, abscesses, cellulitis, thrombophlebitis or other non-specific redness, pain, or swelling were retrospectively reviewed. Patients ultimately diagnosed with chronic infective conditions, with superficial non-articular pathology, or with tenosynovitis were excluded, leaving 77 patients who were reviewed in detail. Overall, 20% of the patients had a diagnosis of septic arthritis, with the remainder largely suffering flares of gout or pseudogout. Only four patients in this series were found to have non-specific inflammation and one experienced an osteoarthritic flare. Unsurprisingly, the vast majority of patients presented with pain in the wrist. Only half of patients, however, had a documented loss of wrist movement. The best predictors for a diagnosis of infection were two raised serum inflammatory markers (erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), or total white blood cell count) with a normal uric acid, which gave, overall, a one-in-three chance of septic arthritis. Patients with a history of pre-existing gout had, overall, a one-in-18 chance of an infective diagnosis; those with a history of chronic kidney disease, previous episodes of wrist inflammation, or a history of raised

uric acid always had a non-infective cause. Plain film radiographs were non-discriminatory, except that the presence of chondrocalcinosis on wrist radiographs was virtually diagnostic of non-septic arthritis. Bony erosions were seen in both infective and non-infective aetiologies. Given that only 53% of the wrist aspirates in the septic group had a positive culture, it seems from this paper that the predictive values of most factors examined are poor. We still have no infallible decision-making tool for this common problem, and further large-scale studies are undoubtedly required. However, this study is useful in that it forms a basis upon which to make some decisions.

Buried K-wires in the fingers?

■ Kirschner wires (K-wires) are often used for the osteosynthesis of phalangeal and metacarpal fractures, and previous studies have shown a decreased risk of infection if wires are buried under the skin. However, this complicates later removal and may be associated with increased costs for wires that cannot be removed in the outpatient setting, exposing patients to the risks and inconvenience of a second operation or local anaesthetic procedure. This study from **Copenhagen (Denmark)** reports on 337 patients who were treated with buried wires and 107 with non-buried wires for fractures of the phalanges or metacarpals.³ The mean number of days before buried K-wires were removed in the outpatient clinic was 30 days, compared with 28 days for non-buried K-wires. In almost 20% of patients treated with buried K-wires, removal was not possible in the outpatient clinic, and return to theatre was therefore required to remove the wires. All non-buried K-wires could, as expected, be removed in the outpatient clinic. Of the patients treated with buried K-wires, 4.1% presented with postoperative infection; all but one case were superficial infections. Of the patients whose wires were not buried, 6.5% presented with infections; all cases



were superficial. The headline result here is that the infection rate in this study was not significantly different between the two groups, but there are some methodological limitations that are worth bearing in mind when interpreting the results. First, this was not a randomized trial and there is no clear description of the decision making behind whether K-wires were buried or not. Also, the regimen for pin site management is not clearly described and it is implied in the manuscript that there was some variation in practice, with some patients perhaps receiving prophylactic antibiotics, presumably in the non-buried group. This is quite a large cohort study, and so does lend some weight to the argument for leaving wires proud, but is by no means conclusive. What is required is a large, well-designed, randomized controlled trial to answer this question once and for all.

Fractures at the junction of diaphysis and metaphysis of the proximal phalanges in adults

■ As with many finger injuries, the optimal treatment of a proximal phalangeal fracture is unclear. Too often, dissimilar fracture patterns are reviewed together, and the conclusions are misplaced. We would raise an eyebrow if we saw research describing a treatment for all types of femoral fracture, yet historically this has been the case for the proximal phalanx. Authors from **Cardiff**

(UK) have sought to redress this by publishing their large series of extra-articular proximal phalangeal base fractures, which is a common adult injury.⁴ They describe a simple and cheap technique of periarticular wiring to overcome the deforming force attributed to the altered line of pull of the intrinsic muscles. Fractures were stabilized using a single extra-articular percutaneous Kirschner wire, which was passed lateral to the metacarpal head into the base of the phalanx, then across the fracture to engage the lateral cortex. Patients were treated semi-electively on a day surgery unit. The metacarpophalangeal joint was splinted in flexion with mobilization of the proximal interphalangeal joints, the wire was removed at 24 days, and the hand was then freely mobilized. In their series of 113 fractures, 82% had full or fully functional range of movement, and 89% had either mild or no pain. Despite the wire being periarticular and not buried, there were only two reported pin site infections, both of which were in patients who did not regularly attend for nurse-led, weekly pin site care. As is common with the hand injury patient cohort, there was a high default before discharge rate, but none of these patients had re-presented with problems. Whilst this is not the highest level of evidence, this paper demonstrates that a clear understanding of the pathoanatomy and simple, careful surgical technique can lead to excellent results.

Distal radial fractures: dorsal tangential views to avoid screw penetration

■ Another issue of 360 and another distal radial fracture paper, although this one takes a different look at the problem. We recognize the importance of treating the dorsal cortex with respect: not enough hold will lead to loss of fixation and a poor outcome, whilst screw penetration risks injury to the dorsal tendons, one of the most common complications. The dorsal tangential view of the distal radius, which

is sometimes termed the skyline view, seeks to determine the position of screw tips in relation to the undulating dorsal cortex accurately. This paper from **Adelaide (Australia)** prospectively reviewed 100 patients undergoing distal radial fracture fixation from the volar side using a volar locking plate.⁵ A variable-angle locking compression plate was utilized, with threaded pegs. Although smooth pegs were an option, the authors' view is that these potentially compromise stability. Intraoperative fluoroscopy views, including anteroposterior, elevated lateral, and dorsal tangential views, were obtained in all cases intraoperatively. Intraoperative screw revision frequency for dorsal screw protrusion, screw position relative to volar plate and to dorsal compartment, and screw lengths were evaluated as part of this study. In this series of 100 fixations, the authors reported that intraoperative dorsal tangential views were taken with the forearm placed at 75° to the horizontal arm table with the wrist and maximum flexion. The dorsal cortex of the distal radius was thereby positioned with 15° of inclination to the vertical x-ray beam. This view demonstrated dorsal cortical penetrance in 26% of patients, despite the surgeons always placing a screw 2 mm shorter than measured. Interestingly, an additional five patients had longer screws inserted and the radial styloid screw had the highest chance of being too long. Despite the authors' careful surgery and imaging, one patient still experienced an extensor pollicis longus (EPL) rupture, which may have been due to a fracture fragment, undetected screw penetrance, or drill-related injury. Although the accuracy of this view has been questioned when compared with CT, it represents a quick, easy, and timely assessment of screw position. Routine postoperative CT would be expensive and would rarely identify additional screw

penetrance over the dorsal tangential view. Surely, this view should become standard practice for everyone fixing distal radial fractures.

Paediatric digital necrosis secondary to dressing application: a case series

■ This article is a sobering reminder of the need for scrupulous care when applying dressings to digits. This group from **Columbus, Ohio (USA)** reports a series of four paediatric patients between the ages of two and 11 years, who presented for surgical consultation related to digital ischaemia and irreversible necrosis following the application of Coban digital dressings.⁶ In this case series, Coban dressing was utilized as a deterrent for thumb sucking, fingertip tuft fractures with nail-bed lacerations, and a phalanx fracture secondary to crush injury. Coban dressings are frequently used in the paediatric population to protect an injury, reduce oedema, and apply gentle pressure while the wound heals. Unfortunately, with minimal manipulation, a circumferential digital dressing may lift and roll distally, resulting in a tourniquet effect. This problem can affect patients of all ages, but is more common in the paediatric population as there may be limited communication of symptoms, resulting in diagnostic delay and significant morbidity. The authors advocate a careful application technique, including unwinding Coban from the roll to allow relaxation and application without stretch, in addition to monitoring for signs of impaired circulation. Some other authors advocate extending Coban wrapping down to the wrist in order to avoid the distal rolling and tourniquet effects at the base of the digit. However, circumferential dressings combined with any degree of elastication are extremely hazardous, especially in this population, and these four cases requiring digital amputation remind us of this.

Factors affecting surgical outcomes of digital glomus tumour: a multicentre study

■ Glomus tumours are rare and benign neoplasms of the great glomus body, which commonly occur in the subungual area, but can also occur in the periungual or pulp areas. Many different surgical techniques have been used to treat these tumours. This may, in part, explain the wide range of reported recurrence and complication rates associated with removal. This study aimed to evaluate three surgical approaches – transungual, nail sparing, and direct approaches – which were performed under loupe magnification or microscopy. The study was multicentre but retrospective and led from **Seoul (South Korea)**.⁷ Despite the relatively rare nature of this diagnosis, the authors were able to report a total of 72 cases over a 15-year period, giving a sensible number of patients about which to draw some inferences. Cases with a follow-up of less than one month were excluded from the series and the mean reported follow-up was 5.4 years. Long-term recurrence was excluded via a telephone survey, which also asked patients to return a mobile phone image of their hands to check for nail deformities. The nail bed was the location of the tumour in 52 of the patients, finger pulp in 13, and nail matrix in seven. In the patients with pulp tumours, a direct approach from the volar or lateral side was utilized. Of the remaining patients with nail matrix or nail bed tumours, a transungual approach was performed on 50 patients; the nail bed was longitudinally incised after nail plate removal. At final follow-up, recurrence was observed in 7% of patients and complications were observed in 12% of patients. Two patients had fingertip numbness and seven had nail deformities. In a group with pulp lesions for which a direct approach was used, and in a surgical loupe group, recurrence rates were high but not statistically significant. A nail-sparing

approach and microscopic excision did not lower the incidence of nail deformities. No risk factors that significantly predicted recurrence were found, although it is probable that the study was underpowered in this respect, and so conclusions are difficult to draw. It is likely, however, that microscope-assisted excision is beneficial in terms of recurrence, as has been previously suggested in the literature.

Assessment of distal radioulnar joint stability after reconstruction with the brachioradialis wrap

■ Instability of the distal radioulnar joint (DRUJ) is probably more prevalent than we suspect, and can present as an isolated injury or an association with a distal forearm fracture. Some studies suggest that up to 19% of all distal forearm fractures are associated with DRUJ instability. Repair of the triangular fibrocartilage complex (TFCC) is a standard treatment but other options for reconstruction are limited. More radical options include the Darrach procedure and the Sauvé-Kapandji procedure. Various tenodesis and allograft reconstruction techniques also exist. This group from **Louisville, Kentucky (USA)** sought to assess the stability of the distal radioulnar joint after reconstruction with a brachioradialis tendon wrap in a straightforward cadaver study.⁸ The tendon insertion is conveniently located at the radial styloid; the tendon is routed around the radius and ulna in a wristband formation, under the extensor tendons and pronator quadratus, then secured back to the radial styloid. Axial CT scans of ten cadaver arms in neutral, 60° of supination, and 60° of pronation were acquired. Surgical disruption of the dorsal and volar radioulnar ligaments was undertaken and the cadavers re-scanned, then a brachioradialis wrap was performed in each and a final scan undertaken. Degrees of subluxation with respect to the sigmoid notch

were determined and compared. Values differed significantly between normal and injured conditions in all positions. No significant difference was noted between normal and reconstructed conditions, suggesting that reconstruction improves DRUJ biomechanics and more closely approximates normal stability. As the authors suggest, the study of this joint is challenging and, while the results of this cadaveric study appear good, we would be keen to

see the results of a sizeable clinical series. It does, however, seem to be another reasonable option in the armamentarium.

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Shoulder & Elbow

X-ref For other Roundups in this issue that cross-reference with *Shoulder & Elbow* see: *Hip & Pelvis Roundups 2 & 7*; *Knee Roundup 3*; *Research Roundup 1*.

Subacromial decompression versus diagnostic arthroscopy for shoulder impingement

■ It has been a poor year for advocates of arthroscopic subacromial decompression (ASD). Further to the Can Shoulder Arthroscopy Work? (CSAW) trial, this group from **Helsinki (Finland)** have now published the Finnish Shoulder Impingement Arthroscopy Controlled Trial (FIMPACT).¹ This was a well-designed, multicentre, randomized, sham-controlled trial. The strength of this trial was in the construction of the surgical intervention arm, which included diagnostic arthroscopy to exclude other pathology. The report focuses on the outcomes of 210 patients who were enrolled over a ten-year period in three public hospitals in Finland. Each patient presented with a minimum of three months' symptoms of subacromial shoulder pain, and had undergone MRI with intra-articular contrast to exclude a cuff tear. These patients were then randomly allocated to surgery or

exercise therapy. Those who underwent surgery were assessed with a diagnostic arthroscopy, and those with shoulder pathology other than impingement were excluded. The remaining surgical patients were further randomized in the intraoperative setting to either a subacromial decompression or diagnostic arthroscopy only, in which case the procedure was terminated (sham group). Patients were followed up to 24 months, with primary outcome measures consisting of visual analogue scale (VAS) scores on activity and at rest, and secondary outcomes of the Constant score, the Simple Shoulder Test score, and 15D score. The primary comparison was ASD versus diagnostic arthroscopy, and a secondary comparison was made between ASD and exercise therapy. A statistically significant benefit of ASD over exercise therapy was found in both the primary outcome measures (VAS at rest (-7.5, -14.0 to -1.0); VAS on arm activity (-12.0, -20.9 to -3.2)), but this did not exceed the pre-specified minimal clinically important difference. The authors encourage caution with respect to this comparison; there may be a true effect that the study is underpowered to detect, or there may be an artificial difference due

to removal of a small number of cuff tear patients from the operative group. The study concludes that both ASD and the diagnostic arthroscopy placebo resulted in significant improvements in pain and functional outcomes, with no difference in the incidence of adverse events. However, the patients assigned to ASD had no superior improvement over those assigned to diagnostic arthroscopy. The experience amongst the shoulder surgeons here at 360 is that subacromial decompression as a stand-alone procedure is performed infrequently, and only in chronic cases resistant to conservative measures.

Age, gender, and reverse shoulder arthroplasty

■ There has been a rapid expansion in the use of reverse polarity total shoulder arthroplasty in recent years and, whilst the reverse was first designed as an intervention for elderly patients with cuff tear arthropathy, its use in younger patients is increasing. It is therefore important to understand how patient demographics affect the success of the procedure, and so we were interested in this study from investigators in **Gainesville, Florida (USA)** and **New York,**

New York (USA).² The authors sought to study the effects of gender and age on outcomes following reverse shoulder arthroplasty (RSA). The paper uses the results of 660 patients, all with either cuff tear arthropathy or osteoarthritis with a rotator cuff tear. Patients underwent a RSA, performed by one of 13 shoulder surgeons, and their results were included in an international database. Simple Shoulder Test (SST) scores, University of California, Los Angeles (UCLA) scores, Constant scores, American Shoulder and Elbow Surgeons (ASES) scores, and Shoulder Pain and Disability Index (SPADI) scores were recorded in addition to range of movement measurements. A linear mixed-effects model was then used to analyze the relationship between clinical improvements, gender, and patient age. When controlling for age, men had significantly better scores in all of the available outcome metrics. When controlling for gender, increased age resulted in improvements in the shoulder scores but poorer outcomes in terms of range of movement. The group also looked at the timing of plateau in improvement of measured outcomes following surgery and found this to be at 12 months in 80% of patients for their metric scores and