

X-ref For other Roundups in this issue that cross-reference with *Foot & Ankle* see: [Trauma Roundup 3](#); [Research Roundup 6](#).

Preservation of the failing total ankle – a pipe dream?

■ In terms of adult reconstruction, total ankle arthroplasty (TAA) is an established but relatively young technology in comparison with implants available for the hip and knee. TAA outcomes have been part of the National Joint Registry since 2010, but the early data capture is likely to be woefully incomplete. Previously reported independent series suggest that ten-year survivals of up to 90% are certainly possible from published series.¹ TAAs are subject to the same failure mechanisms as seen in the hip and knee prostheses, but at an accelerated rate. Osteolysis and cyst formation is evident in around one in five TAAs at five years. The significance of this in terms of the natural history of cyst expansion and subsequent progression to symptomatic loosening of the implant is as yet unknown. Similarly, there is no current consensus as to the indications for operative management of such defects around TAAs. The team from [Duke University, Durham \(USA\)](#) have been addressing early osteolysis with a different approach, undertaking grafting of the defect prior to revising components as necessary. They present their data from a series of 726 patients over 15 years, 33 of whom required revision with grafting to a cystic defect.² The cohort included both fixed- and mobile-bearing implants, and revision was undertaken for patients with radiographic progression of cysts over 1 cm, symptomatic cysts, or varus deformity resulting from component subsidence. It is worth noting that these revision procedures were often combined with revision to long-stemmed TAA components, and grafting was performed with allograft bone chips augmented with

BMPs and other biologically active agents. The success rate, defined as retention of the implants, was stated to be 98% at two years, dropping to 60% at four years. This paper is an important starting point for the development of revision ankle arthroplasty in the presence of bone loss. Although sadly lacking any PROM data at follow-up, this series does provide a guide as to what can be reasonably expected from such revision procedures, and sets a bar by which to measure future attempts at salvage. The use of structural grafting with biological potential, as well as the presence of a well-fixed prosthesis is the key take-home message, and underlines the principles to successful TAA salvage. The argument for implant retention is bolstered by a reported amputation rate of up to 19% following failed salvage arthrodesis performed in the context of failed arthroplasty.³

Arthroscopy following TAA?

■ Sticking with the topic of improving outcomes in TAA, the topic of arthroscopic debridement of the painful TAA is dealt with in this paper from [Brussels \(Belgium\)](#). Although only a very small cohort of 12 patients, the authors describe an arthroscopic approach to tackle ongoing pain following ankle arthroplasty.⁴ Arguing that perhaps this is due to an ongoing synovitis, these surgeons undertook arthroscopic debridement and present their results here. Painful synovitis is a common problem after ankle arthroplasty, and although a broad range of rates are quoted in the literature (between 20% and 60%), it is clear that this is a significant problem and can be difficult to treat, so much so that some designs of TAA have been adapted to include extensions to incorporate the sides of the talus and hence reduce gutter pain. There is a lack of evidence to support this adaptation. The results presented in this paper suggest a

modest but significant improvement in the American Orthopaedic Foot & Ankle Society scores in this post-arthroscopic cohort (improving from a mean of 64.6 to 73.5), with the majority of patients still exhibiting residual symptoms at a persistent, but much lower level. Patients who developed a painful ankylosis across the joint benefited less from debridement, with the improvement in their PROMs less pronounced. The authors rightly emphasise the need to rule out malalignment as the driver for impingement prior to embarking upon a simple arthroscopic debridement, but this paper serves to underline the difficulty involved in treating this patient group, although in selected cases a simple arthroscopic debridement clearly has some utility.

Posterior plating of the distal fibula: should we worry about secondary peroneal tendon attrition? X-ref

■ The treatment of peroneal tendon injuries has now become commonplace, with techniques including repair, excision and tenodesis as appropriate to the degree of injury, and despite some difficulties on occasion reaching the diagnosis, treatments are usually very effective. Plating the posterior aspect of the distal fibula is a widely utilised, useful technique allowing the surgeon to address the deforming forces with a buttress plate. Despite some randomised controlled trials showing equivocal outcomes in Weber B fractures, there remains some concern regarding peroneal tendon attrition following placement of metalwork adjacent to the functional musculotendinous unit. Previous studies would suggest that the incidence of peroneal tendinopathy after posterior fixation may be seen in up to 40% of patients in some series. This observational study from [Seoul \(South Korea\)](#) sets out to ascertain

the incidence of peroneal tendinopathy after posterior antiglide plating of the distal fibula.⁵ The authors report their experience in 70 patients, all of whom underwent posterior antiglide plating of the distal fibula. The incidence of peroneal tendon complications was 4.3% based upon the findings of a direct inspection of the peroneal tendons at removal of the implanted metalwork. On the face of things a reassuring statistic, however, careful inspection of the patient cohort data reveals that nearly 60% of the patients underwent hardware removal for lateral fibula pain, deemed not to be due to peroneal tendon irritation, making us slightly suspicious of definitions. The devil here, of course, is in the details; establishing which structure is the source of pain post-ankle plating is not an exact science, a fact the authors acknowledge. They go on to recommend the use of shorter plates which do not traverse the peroneal groove or indeed extend to the tip of the posterior fibula, and describe their chosen position for the plate to be posterolateral rather than truly posterior. These all seem like sensible measures to avoid symptomatic hardware which requires removal. This technique is a valuable one for salvage fixation and when the posterolateral approach is required to plate the posterior malleolus. Avoiding secondary morbidity from the plate, however, is an important factor when planning fracture fixation.

Augmenting Achilles tendon repairs leads to long-term strength deficits X-ref

■ It is rare to see long-term follow-ups of previously reported randomised controlled trials, however, many studies stop short of appropriate follow-up to establish long-term outcomes. In an interesting study from [Oulu \(Finland\)](#), the authors report the 14-year follow-up of a randomised controlled trial evaluating augmented *versus* simple repair

in Achilles tendon rupture.⁶ The research team report their study of 60 patients, all presenting with an acute Achilles tendon rupture managed over a three-year period. At 14 years of follow-up, 55 patients were available for review. All patients were managed with a similar splinting protocol as their rehabilitation, with the only difference being that 28 patients received a simple end-to-end suture repair while 27 patients received a fascial flap-augmented repair. The research team reported myriad outcomes including the Lepilahti Achilles tendon score, isokinetic plantar flexion strength (peak torque and the work-displacement deficit at 10° intervals over the ankle range of motion), tendon elongation, and the RAND 36-item health survey. The bottom line is that the end-to-end repair group performed better at final follow-up. There were no differences in re-rupture rates and the augmented group had poorer calf muscle deficit that persisted right through to final follow-up.

One screw a screw too few

■ Achieving a stable fixation during arthrodesis is the key to reducing complications including metal-work fatigue and nonunion. The compression screw has long been the most reliable fixation in subtalar arthrodesis, although there are a variety of screw configurations around, all of which have their potential advantages in either surgical access, achieving compression or stability. Researchers in **Kalamazoo (USA)** undertook a biomechanical study using a surrogate bone model of the subtalar joint.⁷ They tested three potential constructs – a single posterior screw, two minimally divergent posterior screws, and a highly divergent screw construct. The stability of the constructs was

tested using a servo-hydraulic testing apparatus. This was then correlated to a fresh cadaveric study using five fresh frozen cadavers. As perhaps could be predicted, the two divergent screws offered significantly higher torsional stability over either of the other constructs. While this in itself is not surprising, it is important to add a slight note of caution: divergent screws by their nature do not increase the compression with the addition of the second screw and, as such, care should be taken in placement of the initial screw specifically to ensure that as much compression as possible is achieved prior to placement of the second screw, to ensure effective fusion.

Osteochondral defects more common than previously thought X-ref

■ The relatively poor outcomes in ankle fractures are puzzling. Up to a third of patients experiencing a simple ankle fracture will never recover to their pre-injury status, experiencing long-term restrictions in function. While there are a number of theories as to why this might be, there is a distinct lack of evidence to support one potential cause over another. Researchers in **Amsterdam (The Netherlands)** have set out specifically to establish what the impact is in terms of long-term function.⁸ Their

study concerns 100 ankles, all requiring fixation following fracture of a range of Weber subclassifications. Each patient underwent a CT scan following fixation, and the presence and type of osteochondral defect (OCD) was diagnosed from this scan. Clinical outcomes were assessed

at a year following surgery using the Foot and Ankle Outcome Score, and the results stratified by OCD presence and type. In this series, 10% (n = 10) of ankles had sustained an



osteochondral defect. The lesions were all isolated talar injuries and were an average of 4 mm in diameter. Although one might have expected those patients with osteochondral injuries to have a poorer outcome, this was not in fact the case in this study. How much weight can be given to this finding really depends on the interpretation of any perceived variation in outcomes between ankle fracture types and osteochondral defect types. With a low event rate, if there is a broad spread of pathologies and functional impairments between outcomes then it stands to reason that there may be an element of type II error here.

Measuring range of motion in the foot and ankle

■ Taking a slightly different approach to that seen in a hand paper in this month's 360, researchers in **Stanmore (UK)** set out to establish if their standardised measurement for range of motion used in the TARVA (Total Ankle Replacement Versus Arthrodesis) study^{9,10} really is a standardised measurement. The protocol utilised a digital goniometer, and the composite range of motion in the hindfoot was measured by measuring the tibial:floor angle. Two observers conducted measurements on 46 ankles from two groups: controls, and patients with ankle arthritis treated in a variety of ways. The measurement method was validated with both intra- and inter-class correlations. The authors established that the median difference was just 1.5° within observer, and the intra- and inter-class correlation coefficients were excellent at 0.95 and 0.94 in the two groups. The accuracy of the measurements was equally impressive in the ankle arthritis group. These authors have clearly shown that the use of a digital goniometer and their method provides an accurate and reliable measurement of ankle range of motion. However, the measurement is not necessarily precise. To estimate the precision

dynamic range of motion, radiographs would be required.

Transfibular approach – the future of ankle arthroplasty?

■ As surgeons continue to elusively seek the everlasting (or at least ten-year lasting) ankle arthroplasty, more innovative approaches to solving the various biomechanical problems that limit longevity and therefore success have led to some unusual designs of ankle replacement. The transfibular total ankle arthroplasty is a similar innovative approach. Osteotomising the fibula allows access to the lateral portion of the ankle joint. This in itself obviously causes some morbidity, however, there is a not unreasonable argument that the direct approach to the joint allows for more accurate positioning of the centre of rotation, potentially smaller bone cuts, and avoids the risks of traction injury to the dorsal neurovascular bundles. Despite these theoretical advantages, and the commercial availability of implants and instrumentation for performing the procedure, there are no reports of complication rates to support the assertion that this may be a safer option. A surgical team in **Baltimore (USA)** have produced an early report of their own experience with 20 total ankle arthroplasties, aimed at assessing the safety of such an approach with regard to intra-operative complications.¹¹ As would be expected with an early safety report, follow-up was only 18 months, and the article focuses on safety rather than clinical outcomes. The authors saw no cases of fibular nonunion, although there were four re-operations. Two of these were arthroplasty-related (one for anterior impingement and one for deep infection), and, in addition, the fibular plates were removed in two cases. We would tend to agree with the authors here – this early series supports the use of such an approach and shows the complication rates to be in line with the widely accepted anterior approach to ankle arthroplasty.

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Wrist & Hand

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The elderly wrist fracture – to treat or not to treat?

■ It has been known ever since Abraham Colles that older people with wrist fractures usually do unexpectedly and remarkably well. We suspect that there is a temptation to fix these surgically unless the fragments are well reduced and stable; surgeons not wishing to be ‘ageist’, and with a paucity of data to support differing treatments by age, there may be a temptation to over-intervene in the elderly. A team from **Wenzhou Medical University, Wenzhou (China)** has reviewed the available literature, and produced a worthwhile analysis including two RCTs and four retrospective studies.¹ Their review reports on the expected outcomes of surgical and non-surgical treatment in patients over 60 years of age, with an isolated distal radial fracture. The study team report that, in composite outcome analysis in patients over 60 years, although surgery gave better grip strength and improved radiology, this was at the expense of a higher complication rate with no evidence of better clinical outcome measured with a goniometer, pain scales and functional scores. So in these days of risk aversion and cost

pressure, one might consider the evidence and relieve some elderly patients of the imposition of an operation.

How reliable is wrist arthroplasty?

■ We are familiar with the excellent and durable results for many designs of hip and knee replacement, yet the metal-on-metal saga reminds us that implant surgery can be at best unreliable, if not catastrophic. When even elbow and ankle replacements are starting to get their share of good long-term follow-up series, it does beg the question: why does wrist arthroplasty not have such a good pedigree? The orthopaedic literature is riddled with fairly encouraging small series of short-term results, however, some designs have been withdrawn. With a niche operation with currently limited indications and little evidence to support its outcomes, it is tricky to formulate an opinion on the likely success of such a procedure – particularly so when many reports are written by early adopters or designing surgeons, which introduces a certain bias into the proceedings. A group from **Thomas Jefferson University Hospital, Philadelphia (USA)** is to be applauded for their candour in reporting the rather miserable results from their large series of 105 total and partial wrist replacements.² With a mean follow-up of just 35 +/- 28

months, the surgical team reported 51% of patients suffered a complication and 39% required a revision procedure. Stiffness and component failure were the most common reasons. Hand surgeons would be wise to make their patients aware that wrist arthroplasty, although an appealing concept, remains experimental.

Antibiotics in simple hand trauma

■ From time to time a study is published which really should alter practice, and here at 360 we would recommend a change in practice based on this paper. Antibiotics are expensive and there is the matter of resistance, which may one day become an apocalyptic public health issue, so we all have a responsibility for stewardship of antibiotic use. In this important work from **Oxford and London (UK)**, a meta-analysis was undertaken of antibiotic use in simple hand wounds requiring surgical treatment.³ Following a fairly extensive review of the literature, the study team was able to include 13 studies reporting the outcomes of 2578 patients. The authors quite sensibly excluded open fractures, crush injuries and bites from their meta-analysis. The majority of studies were of good quality evidence with five RCTs reported, allowing for some meta-analysis to be performed. The headline result is that there were no differences in infection rates between

those managed with and without prophylactic antibiotics (risk ratio 0.89, range 0.65-1.23). In this large and well conducted meta-analysis, there was no evidence that the routine use of prophylactic antibiotics reduces the infection rate in simple hand wounds. There is a clear message: these injuries should not receive prophylaxis.

BMP complicates scaphoid nonunion surgery

■ Nonunion is one of the last ‘unsolved’ problems in surgery – even those with major practices in nonunion and trauma have difficulty goading some fractures into union. This, combined with the blossoming basic science to support our understanding of matrix biology and bone healing, has resulted in a range of ‘biologics’, the first of which was of course the recombinant human protein (rhBMP). Initially widely adopted in trauma nonunion and the spine, reports of complications, high costs and even suggestions of cancer and local compressive symptoms from prolific bone formation have resulted in a steady erosion of its regular use. That said, there is no doubt that rhBMP does have a profound effect on the formation of callus. We were intrigued to read this brief report from **OrthoCarolina Hand Center, Charlotte (USA)**, describing the authors’ experience in just six cases of recalcitrant nonunion of the scaphoid;⁴ to our