

ROUNDUP³⁶⁰

Foot & Ankle

Is arthroscopic arthrodesis advantageous?

■ The use of the arthroscope in the foot and ankle is far from ubiquitous with proponents on both sides of the fence arguing their own corner. The keen arthroscopists are able to perform a dizzying array of interventions arthroscopically, but mainstream practice lies somewhere in the middle with surgeons choosing one technique over another on a case-by-case basis. With ankle arthrodesis, proponents of the arthroscopic technique argue there are lower infection rates, reduced time to fusion and shorter hospital stays. The counter argument is that significant deformity is difficult to correct, and access to portions of the talus is limited, precluding complete preparation of the tibiotalar joint. Researchers from **North Shields (UK)** noted that there is a lack of high quality prospective evidence with which to inform these decisions. They therefore set up a prospective comparative series (Level II evidence) of arthroscopic *versus* open ankle fusion. The team conducted their study in two parallel institutions and obtained two years of prospective follow-up data. Their primary outcome measure was the Ankle Osteoarthritis Ankle score (AOAS). They also assessed the SF-36, hospital episode details and post-operative radiographs. The study included 60 patients (30 arthroscopic, 30 open) undergoing fusion for osteoarthritis of the ankle and all patients reported a

statistically significant improvement in their post-operative outcome measures. There were no differences in the AOAS between the groups although the arthroscopic group reported significantly shorter hospital stay with no difference in radiological outcome or time to union.¹ The researchers have done a great job of comparing two similar interventions. While it can be argued that comparative case cohorts like this do not allow for an adequate measure of control to truly define which treatment is best, there is much useful data presented here. It is clear that use of the arthroscope does not compromise alignment or union rates but has the benefit of improved length of stay. Arthroscopic, it seems, may well be the way forward.

Osteochondral autografts: what predicts outcomes?

■ In the contentious field of biological repair of cartilage defects there is usually a range of biological, animal model, *ex vivo* and *in vivo* data to support the use of all available treatments. What is sadly lacking, however, is long-term repeat scope results either with subsequent tissue sample or not. Researchers from **Seoul (South Korea)** have stepped up to fill a hole pertaining to the osteochondral transfer system in the literature, and in particular its use in isolated talar dome defects. The research team included 52 patients who had isolated talus osteochondral defects treated

with osteochondral graft transfer. Patients underwent their treatment and were evaluated including second look arthroscopy at over 12 months of follow-up. The research team established clinical outcomes with a combination of VAS for pain, AOFAS score and Tegner activity scale. Subsequent analysis was undertaken to identify demographic, surgical and lesion-specific factors that were predictive of the success of the surgery. The investigators report that all three scores significantly improved from baseline at final evaluation (VAS 6.9 to 3.3, AOFAS 67.4 to 82.6, Tegner 3.0 to 3.9). While the majority of patients ($n = 49/52$) reported they were satisfied with the surgery there were still some prognostic factors that could be identified for successful treatment. The strongest predictor was the arthroscopic appearance of the graft. Patients with signs of soft-tissue impingement and uncovered areas around the graft did significantly worse on the Tegner scale than those without. Clinical outcomes were worse in the patients who had signs of uneven articular surface of the tibial plafond at the malleolar osteotomy site in both VAS and AOFAS scores. Surprisingly, the majority of patient factors (age, gender, duration of symptoms) and lesion characteristics (defect size, depth, location and the presence of a subchondral cyst) did not significantly influence clinical outcomes.² Despite being a retrospective case series (Level IV

evidence), this paper presents important data. MRI scanning only gives an idea of cartilage structure and function. Arthroscopy remains the investigation of choice. The authors have established for the first time that the macroscopic appearance of cartilage is directly associated with poor scores on the VAS and AOFAS scores; that in itself is worthy of publication. They conclude that accurate restoration of the joint surface after osteotomy and care to avoid uncovered areas surrounding the graft site and soft-tissue impingement, could drastically improve clinical outcomes for what appears to be an otherwise successful procedure.

Minimally invasive: minimal trouble?

■ Although popular with patients and surgeons, minimally invasive forefoot surgery has caused a rift within the world of foot and ankle surgeons. The proponents argue that smaller scars and improved cosmetic results not only improve patient satisfaction but reduce the rate of infection. The naysayers argue vociferously that the anatomy is not amenable to such minimally invasive techniques and the potential for iatrogenic neurovascular injury is high. The topic is becoming more and more highly charged as patients are becoming aware of the availability of 'keyhole' bunion surgery and are starting to actively seek out surgeons offering the technique. Surgeons in **Coventry (UK)** have ventured into

this debate with a study aiming to establish the risk or otherwise of neurovascular injury when performing minimally invasive surgery. The team report on ten cadaveric feet which all underwent mini-C arm controlled minimally invasive surgery performed by two different surgeons. One was a trainee and had no formal training while the other was a consultant surgeon who had been on a cadaveric training course, but crucially neither had performed any of these procedures on live patients. The surgeons performed the same group of operations on each foot, a lateral release, and minimally invasive chevron and Atkin osteotomies (MICA). In addition, an extra-articular distal metatarsal osteotomy (DMO) was performed. After surgery each foot was carefully dissected to establish the presence or absence of any tendon and neurological injury. The authors established that the cutaneous and plantar inter-digital nerves were intact in every case and there was no apparent damage to the neurovascular bundle. There were also no tendon injuries identified. However, neither surgeon had been able to achieve cuts in the desired plane in any case for the MICA and DMO.³ It struck us at 360 that perhaps when assessing the efficacy and safety of a controversial technique such as this, it is probably best not to start with someone who is very much on a learning curve. The authors have effectively established the safety of such an approach with no instances of neurological damage; however, this is in the context of osteotomy cuts performed in the incorrect plane. We have some concern that this study does not really represent a true picture of what an experienced surgeon could achieve, and we are unable to decisively say, from this paper, that it is or is not possible to accurately perform forefoot osteotomies in a minimally invasive manner safely. We would love to see a further study with

surgery performed by an experienced surgeon. After all, no matter how safe the technique is, there is hardly any point if the technique cannot be used to achieve the desired result.

Suture button associated fractures

■ Albert Einstein famously said: If you do what you always did, you will get what you always got. In orthopaedics and surgery in general this mantra should be taken to heart perhaps more than any other. The problem is in the unsaid; Einstein does not promise us that doing something different will give a better result, just a different one. Surgeons from **Fort Lauderdale (USA)** took Einstein's advice and designed a novel technique to address high inter-metatarsal angles in patients undergoing hallux valgus surgery. Their novel approach involved the use of a suture button implant to reduce the inter-metatarsal angle. They designed a retrospective case series (Level IV evidence) to review the outcomes of the new technique: they placed a TightRope™, or two, between drill holes in the first and second metatarsal. They did not perform an osteotomy of the first metatarsal but did combine this with an Atkin osteotomy or soft-tissue augmentation as required. They report on 25 patients (all with unilateral procedures) who had undergone the technique at a mean follow-up of 22 months. They reviewed medical records, radiographs and AOFAS scores obtained at latest follow-up with those collected immediately post-operatively. They established that the technique effectively reduces the inter-metatarsal (15.1 to 8.2) and hallux valgus angles (30.5 to 10.2). Although the correction achieved was good, the authors also report a very high complication

rate from the procedure. The overall complication rate exceeded 50%, including two patients with overcorrection (hallux varus), a third of patients developing stress fractures of the second metatarsal, and a single implant failure.⁴ The authors conclude that although the implant reduces the inter-metatarsal angle effectively it is associated with a higher complication rate than the accepted rates for inter-metatarsal osteotomies. Here at 360 we commend the surgeons for their innovative approach, but cannot help feeling that Einstein was right; these authors did things very differently and changed what they got. We will be sticking with the more traditional metatarsal osteotomies.

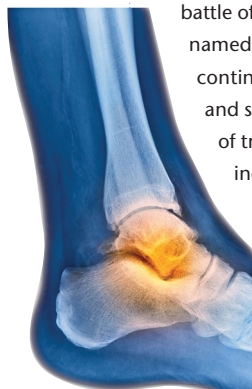
Ultrasound may solve Achilles tendinopathy

■ Over 4000 years after the death of Achilles at the possibly fictional battle of Troy, the eponymously named Achilles tendinopathy continues to trouble patients and surgeons alike. The range of treatments available include ultrasound, physiotherapy and eccentric loading, surgical debridement and steroid injections. Given the potential risk associated with surgery, extracorporeal shock wave therapy (ECST) offers an attractive option for those patients who are resistant to conservative therapies. A review team in **Riyadh (Saudi Arabia)** set out to establish what evidence exists for the use of ECST in insertional and non-insertional tendinopathy. They performed an extensive literature search using all of the widely available biomedical research databases. They produced a well-constructed systematic review (Level 1 evidence) with meta-analysis. Having identified and screened for eligibility 83 articles, they identified six that were relevant to the question. Two were intervention studies and four were randomised

controlled trials. The methodology of each study was assessed using the PEDro scale and Modified McMaster tool, while the strength of evidence was assessed using the MRC body of evidence framework. The studies reported the results of 239 patients and, although they all used slightly different protocols for ECST patients, all received between three and four sessions separated by a week with approximately 2000 impulses at varying frequencies. Despite the studies all having various methodological flaws, inconsistencies in intervention and inclusion criteria, they were assessed as having satisfactory methodology and four out of the six studies demonstrated significant positive results. The authors concluded that, overall, the studies supported the use of ECST in the majority of patients, with strong evidence to suggest symptomatic improvement up to three months' follow-up.⁵

Men beware: your Achilles is not safe

■ Researchers in **New York (USA)** have specifically examined the gender preponderance for Achilles tendon ruptures. They note that although widely accepted that the incidence is higher in men this has not been specifically studied. They conducted a retrospective comparative cohort study (Level III evidence) to establish the incidence of Achilles tendon rupture in women. Using the records of seven foot and ankle surgeons searched by ICD-9 codes, they identified 468 patients and undertook a notes review to ensure accuracy of coding and collated demographic information including gender, age, side, mechanism and acuteness of pathology. Of the 468 identified patients, 358 were found to have acute Achilles tendon ruptures with a male:female ratio of 6:1. They identified a significantly lower age in males for acute rupture (mean age 44 *versus* 55) and 80% of males and 70% of females reported sports activity as the cause of their rupture. The authors note



that because the ICD codes do not distinguish between several different diagnoses and the male:female ratio has been previously reported at 2.8:1, it seems likely that many previous studies using ICD codes have overestimated the female population and included patients who did not have a rupture.⁶ Here at 360 this seems to us to be a succinct study laying the groundwork for a more careful future prospective study. We would love to know if women have better tendons or if different lifestyle or psychological profiles make men take more risks that result in this profound difference in rupture rates.

Charcot and antibiotic-coated nails

■ Treatment of an infected charcot joint is one of the trickiest surgeries that a foot and ankle surgeon is called on to undertake. Hind foot charcot in combination with infection can even result in amputation, particularly if the infection cannot be eradicated. Traditional wisdom teaches that either the hind foot fusion nail or circular frame are the most reliable method of addressing this complex problem, and with the advent of antibiotic-coated nails, researchers from **New York (USA)** have further developed the treatment of this condition. The surgical team reports a case series (Level IV evidence) of five patients with infected charcot joints treated with a

retrograde antibiotic-coated fusion nail. In three cases the nail was used as a salvage option after failure of a frame-assisted fusion, and in two cases as primary treatment. In all cases the surgical regimen was an open debridement and arthrodesis followed by insertion of a locked antibiotic-coated nail. Patients were followed up for a mean of 18 months and in all cases fusion and eradication of infection was achieved. The average time to union was four months.⁷ Although a very small series we feel this is worthy of note. The antibiotic-coated nail provides a new bail-out procedure for patients with complex problems, or failed previous surgery who may have been facing an amputation. This is certainly a technique all foot and ankle surgeons should have available.

Botox and Policeman's Heel

■ We are not entirely sure from reading the current literature what the pathophysiology is behind plantar fasciitis, nor are we certain about the best treatment. However, we were delighted to see some high quality evidence comparing two accepted treatments, that of botulinum toxin A (botox) and intralesional steroids. Both of these have been tested and found to be efficacious in previous placebo-controlled trials, but never in a direct comparison. A research group from **Leon (Mexico)** designed a randomised controlled

trial (Level I evidence) to establish the superiority of either intralesional steroids or intramuscular (gastroc-soleus complex) botox. They enrolled 36 patients into the study, of whom 17 were randomised to steroids and 16 to botox. The patient outcomes were established with a combination of a VAS for pain, AOFAS score and foot and ankle disability index (FADI). Follow-up was to six months and in addition to the injection all patients received an education session and were asked to perform plantar fascial stretches on a regular basis. The injections were performed in the clinic and no radiological guidance was used. The botox was applied at two points either side of the greatest muscle bulk and the steroid deep to the plantar fascia on the medial border of the foot. The authors found no difference in pain scores prior to injection between the two groups (VAS 7.1 versus 7.7) but by the third post-operative visit the botox group had significantly lower pain scores (VAS 1.9 versus 3.4). This difference was consistently maintained to the final follow-up visit, and similar differences (significantly in favour of botox) were seen in both the AOFAS and FADI scores.⁸ The researchers have comprehensively presented data that supports the use of botox over steroid injection in the treatment of plantar fasciitis. Although their study does not include a placebo arm, both interventions have been previously

demonstrated to be efficacious in placebo-controlled trials. For us at 360 this evidence is currently strong enough to make botox the injection of choice.

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