ROUNDUP360

Foot & Ankle

Correcting the overcorrected club foot

Management of resistant clubfoot in children can be extremely challenging. Although the Ponsetti method has reduced the need for surgery, there remain patients who have been treated previously, and those with resistant club feet who require surgical correction. A common complication of surgical correction of club foot is overcorrection, and precious little is known about the outcomes of these patients. Like many life-long diseases that straddle adult and paediatric orthopaedic surgery some joined up thinking is required to achieve the best for these patients. This month sees the publication of one of the few articles concerning the correction of the overcorrected club foot. Overcorrection of club foot deformity can present with a typical pattern of pes-planus which is driven by a hindfoot valgus deformity of the ankle and subtalar complex. This in turn leads to calcaneofibular and anterior ankle impingement. Surgeons in **Liestal (Switzerland)** have been treating these patients with a supramalleolar osteotomy. They designed a prospective case series (Level III evidence) to assess surgical outcomes in terms of radiological appearance, pain relief, and functional improvement in a group of patients presenting with symptomatic overcorrected club feet. They report the outcomes for 14 patients treated with a supramalleolar osteotomy. Patients in their study had a mean age of 37 years and follow-up was to an impressive mean of five years. A thorough radiological assessment (distal tibial joint surface angle, tibiotalar angle and calcaneal offset) was performed, and clinical outcomes measured using a visual analogue pain score and the American Orthopaedic Foot & Ankle Society (AOFAS) hindfoot score. No patients suffered peri-operative complications and all osteotomy sites united. Radiologically, the distal tibial articular surfaces normalised in all cases. Outcome scores following surgery were significantly improved with a mean improvement in pain score of 1.9 points and the AOFAS hindfoot score by 26.2 points. Subjective examination appeared to demonstrate abolition of the symptoms and signs of impingement associated with an objective improvement in ankle motion of 5°.[1] Although this is a small series of patients it is reassuring to *360* to read such a carefully compiled study describing salvage surgery for a rare presentation with an excellent result. While the ongoing push for evidence-based medicine ceaselessly focuses on randomised controlled trials of common conditions we must remember some conditions are rare enough that a well conducted prospective case series such as this is equally valuable in guiding practice.

Syndesmotic surgery may not be as simple as we think

It is interesting that despite being a relatively common injury the best treatment for ankle fractures and their associated syndesmotic injuries remains unclear. Much attention has focused upon the surgical technique of syndesmotic repair, but despite the best efforts of the orthopaedic community, the ideal option is still elusive. The most common treatment for a syndesmotic injury is open reduction and stabilisation using one or more syndesmotic screws. Researchers from **Heidelberg (Germany)** decided not to look at the type of surgery, but how well it was performed. Here at *360* we agree that in fact we may all be missing a trick. Starting with the supposition that intra-operative imaging may not provide a truly accurate picture of the quality of reduction, they designed a study with the aim of assessing whether adequate reconstruction of the syndesmosis had occurred intra-operatively. This was evaluated post-operatively by assessing correct positioning of the distal aspect of the fibula in the tibiofibular incisura after syndesmotic screw insertion. The researchers performed three-dimensional CT scans in theatre after repair. They identified 2286 ankle fractures of which 251 had an unstable syndesmosis requiring stabilisation. The intra-operative 3D scan altered surgical treatment in 82 ankles (32.7%). The most common alteration was an adjustment in the alignment of the fibula in the tibiofibular incisura. The most common malreduction was anterior displacement and internal rotation of the distal aspect of the fibula. The authors comment that the correct position of the syndesmosis cannot be evaluated reliably with conventional radiographs and intra-operative fluoroscopy, and recommend routine use of intra-operative 3D imaging for all patients.[2] This has caused a bit of a stir at *360* as in many hospitals there are no facilities for intra-operative CT to be performed. We wonder if all 82 patients with CT evidence of malreduction who underwent revisions truly had a better outcome as a result of their CTs, or were the surgeons relying on the forthcoming CT to guide reduction? This article is certainly food for thought, but here at *360* we will not be installing CT scanners in theatre just yet.

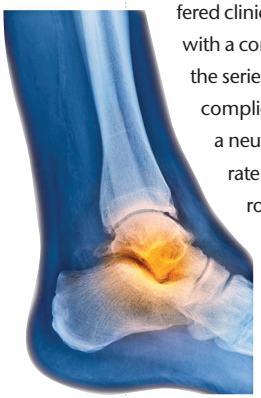
Osteochondral autograft effectively treats larger osteochondral defects

The treatment of osteochondral defects following traumatic injury to all joints remains opaque. Much research has focused on osteochondral defects in the knee and ankle, and to a lesser extent the hip. However, there are few reports of the treatment of, and potential sequelae arising from, osteochondral defects in the first metatarsal head. Treatment options for the first metatarsophalangeal joint are many and varied, including osteotomy, chielectomy, microfracture, fusion and arthroplasty. There is very little research concerning the potential for osteochondral autograft. Researchers in **Seoul (South Korea)** set out to investigate the potential clinical benefits of an osteochondral autograft system compared with microfracture in a retrospective comparative cohort study (Level III evidence). The study was designed to evaluate the efficacy of the two interventions using clinical outcomes of a visual analogue scale for

pain, the American Orthopaedic Foot and Ankle Society (AOFAS) metatarsophalangeal-interphalangeal scores, and the Roles and Maudsley scale. A total of 24 patients were enrolled in the study; 14 underwent subchondral drilling and a further ten were treated with the osteochondral autograft system. All patients in both groups had an improvement in mean VAS pain scores from 6.9 to 3.9, although this did not differ between groups. The AOFAS score significantly improved in both groups from the pre-operative baseline. The authors report that a large defect size (≥ 50 mm^2) and the existence of a subchondral cyst were predictors of unsatisfactory clinical outcomes in the drilling group, but not the autograft group. The authors also report a multivariate analysis demonstrating that larger defects were associated with poor outcomes in the drilling group, but not the allograft group.[3] The authors were unable to find any association between location of the defect and clinical outcome in either group. In this series the osteochondral autograft transfer system appears to be the treatment of choice for osteochondral defects of the first metatarsal head. However, it is important to put results into context, particularly when complex statistical analysis has been performed in small sample sizes. Whilst the results of this study are encouraging, here at *360* we usually eye with suspicion results based on multivariant analysis in small sample sizes. They are, after all, technically invalid.

Sesamoidectomy provides pain relief after fracture in athletes

Sesamoid fractures are always a challenge to treat. While the majority heal as the bone ends are held together, some do not. Most common in young athletes, these can be disabling injuries, and many progress to symptomatic nonunion. Primary surgical fixation, or nonunion surgery is challenging, and has been reported previously to have a high failure rate and prolonged return to activities or sports. As these injuries often occur in elite or professional athletes, surgeons have traditionally shied away from surgical management. Researchers in **Boston (USA)** designed a study to evaluate the efficacy of sesamoidectomy in patients with symptomatic fractures which did not respond to conservative treatment. The patients' outcomes were described with the primary outcome measure being the time it took to return to normal activities. The authors report the outcomes of 24 patients. Their study included five elite-level athletes and 19 active individuals with a mean age of 32 years and a mean follow-up of 35 months. A total of 22 patients (90%) returned to all activities by a mean of 11 weeks, and reported improved pain from a pre-operative mean of 6.2 to 0.7 on a visual analogue scale. A single patient developed hallux valgus after excision of the medial sesamoid.[4] These results of a prospective case series are impressive with good outcome scores and a low rate of complication after sesamoidectomy for fracture unresponsive to conservative measures. This series lends evidence to the practice of treating symptomatic sesamoid fractures in athletic individuals with sesamoidectomy.



Complications in ankle replacement

Arthroscopic procedures have become increasingly popular with therapeutic interventions more achievable for a variety of pathologies. Like many areas of surgery, however, the literature has failed to keep pace with the range of, and indications for, procedures. As with all surgical interventions it is difficult to perform a well-controlled randomised controlled trial, but to properly balance risks and benefits a thorough understanding of the complications is required. We were delighted here at *360* to see researchers in **Amsterdam (The Netherlands)** taking this forward. They performed an impressive retrospective review of consecutive patients (Level II prognostic study) undergoing ankle arthroscopy between 1987 and 2006. All 1305 procedures reported were performed in the research group's hospital with a two-portal approach. Soft-tissue distraction was applied as necessary, and the dorsiflexion position was used, when appropriate, to reduce complication rates. The authors offered clinical review to all patients with a complication recorded in the series. They report an overall complication rate of 3.5% and a neurological complication rate of 1.9%. All of the neurological complications were directly related to portal placement. In all cases there was a sufficiently significant resolution in symptoms to avoid functional limitations and restriction of daily activities. The investigators also noted an association between increasing age and the frequency of complications.[5] Here at *360* we were delighted to read this report of a large series of patients undergoing ankle replacement and to find it is indeed as safe as we tell our patients it is. Previous reports in the literature have noted complication rates approaching 10% and we wonder if the combination of intermittent traction and dorsiflexion for portal placement may have a role to play in decreasing post-operative complications. We also wonder how important the learning curve really is; with such a large series of patients, the authors must be well beyond their learning curve and as other groups report, perhaps as these other series are re-reported, the accepted complication rates will continue to fall.

The arthroscope is effective in the treatment of ankle osteoarthritis

The arthroscopic treatment of degenerative joint disease is becoming increasingly difficult to justify in these times of economic woe. A number of high-profile papers have found little benefit for treating the painful symptoms of degenerative joint disease in the knee, with benefits only seen in patients with mechanical locking. What hope then for ankle arthroscopists where mechanical symptoms are rare and pain common? Researchers from **Seoul (South Korea)** have designed and executed a prospective case series study to evaluate the benefit of therapeutic ankle arthroscopy in mild to moderate degenerative joint disease. They report the results of 63 patients with a mean age of 53 years, all of whom underwent arthroscopic treatment for ankle arthritis. The researchers followed up the patients to a minimum of two years, and attempted to elucidate the factors predictive of successful treatment, using VAS scores for pain and the AOFAS ankle-hindfoot score to determine clinical outcomes. The authors found a highly significant improvement in the pain and function scores sustained over a two-year period, although the results were most marked at six months follow-up. The investigators found that only BMI and the presence of intra-articular lesions affected outcomes while age, gender, symptom duration, treatment modality, joint alignment and type of osteoarthritis did not play any role in determining the eventual outcomes of the patients.[6] It was refreshing to see a study which demonstrates significant, long-lasting symptomatic relief in patients with ankle arthritis. This study adds clinical evidence to the common practice of arthroscopic debridement in mild to moderate ankle arthritis.

Popliteal block in ankle fixation

Post-operative pain control in extremity trauma surgery can be difficult to achieve. In certain situations, such as when compartment syndrome is a risk, or iatrogenic neurological injury may have occurred, regional analgesia may be

contra-indicated, but in others it may be of significant benefit. That said, there is little more frustrating than watching the anaesthetist struggle with the ultrasound machine before the start of an operation, so it is heartening to see some evaluation of the efficacy of regional blockade in ankle fracture surgery. Researchers from **New York (USA)** designed a prospective randomised controlled trial (Level I evidence) to see if all that waiting is really worth it for the patient. Patients were recruited to the study presenting with an ankle fracture requiring open reduction and internal fixation. Patients were randomised to receive either general anaesthesia (GA) or a popliteal block and sedation (PB). Outcomes were assessed with pain scores at regular intervals using a visual analogue scale. A total of 51 patients were included in the study; 25 were randomised to PB and 26 to GA. There were no complications reported with either anaesthesic modality. The patients in the GA group had significantly higher pain scores at two, four and eight hours post-operatively, while the situation reversed between 12 and 24 hours.[7] The authors have ably demonstrated that by 48 hours there is no difference in post-operative analgesia. They also describe the phenomenon of rebound pain, when as the PB wears off the patient experiences more pain than if they had no PB. It seems to us that either modality is acceptable, assuming the patient has adequate analgesia available when the block wears off. Here at *360*, in light of this paper, we may be spending less time looking at the ultrasound machine in future.

da Vinci: a modern foot surgeon?

■ We could not resist drawing the reader's attention to this study from researchers in **Kalamazoo (USA)**, charting the contribution of Leonardo da Vinci (1452 to 1519) to the modern understanding of foot and ankle anatomy, function and biomechanics. The researchers collated da Vinci's drawings and scientific notes, and reviewed current foot and ankle topics in medical journals. Using cadaveric dissection of 30 specimens performed in Santa Maria Nuova Hospital in Florence (Italy) and Santo Spirito Hospital in Rome (Italy), da Vinci had a surprisingly contemporary understanding of foot and ankle principles. He described in detail the anatomy, statics and joint stabilisers, sesamoid biomechanics, and structural support of the foot.[8] Leonardo, as we all know, was a genius with few parallels throughout history, however, even to the boffins at *360* his understanding of foot and ankle principles came as a bit of a surprise.

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