

question of the role of unicompartmental knees becomes much more complex. A study team based in **Marseille (France)** have attempted to unpick at least some of this tough-to-resolve question by examining the complexities of the revision surgery.⁷ The team undertook a case-matched study, with 48 unicompartmental revisions matched carefully to 48 primary and 48 revision knees in their centre. The results of their study are suggestive that at their mean follow-up of seven years, functional outcomes and survivals of revision unicompartmental knee arthroplasty are more akin to revision knee arthroplasty than primary knee replacement. The authors make the argument that even if this is less challenging surgery than 'full' revision knee, the clinical outcomes aren't as flawless as proponents of the technique would have us believe.

The big questions first **X-ref**

■ Some of the major questions in surgery have never been answered. While the push for evidence-based medicine is clearly a strong and well-reasoned one for some interventions,

perhaps the answer is self-evident – in the same way that parachutes will never be subjected to a randomised controlled trial, neither will chest drains for tension pneumothoraces. Somewhere beneath these self-evident truisms, however, lie accepted interventions (such as TKA and ACL reconstruction) that don't always stand up to evaluation in a randomised control trial setting. While hundreds of thousands of patients undergo total knee arthroplasty (TKA) each year, there is surprisingly little actual efficacy evidence comparing TKA with non-operative treatment, partly due to the difficulties associated with recruiting to such studies. We were heartened, here at 360, to read a report in the *New England Journal of Medicine* of a simple, randomised controlled trial performed in **Aalborg (Denmark)** comparing TKR with non-operative treatment.⁸

This randomised controlled trial of 95 patients reported outcomes of the KOOS score at one year for patients randomly allocated either to knee arthroplasty plus 12 weeks of non-operative treatment, or the

non-operative treatment alone. The non-operative treatment consisted of exercise, education, dietary advice, use of insoles, and pain management. Patients' outcomes were reported on an intention-to-treat basis and 25% of the non-operative group received a TKA within the one-year follow-up period of the study, with the operative group also benefiting from a greater improvement in the KOOS score (32.5 point improvement *versus* 16 points). However, there was also a higher rate of serious adverse events (24 vs six events). With a 25% crossover rate and greater improvement in outcome scores in the operative group, it seems self-evident that the benefits of TKA are now 'evidence-based'. This kind of well-controlled study is extremely useful not only in justifying treatment, but in allowing estimation of effect sizes and as a benchmark against which to judge other interventions.

REFERENCES

1. **Hooper N, Snell D, Hooper G, Maxwell R, Frampton C.** The five-year radiological results of the uncemented Oxford medial

compartment knee arthroplasty. *Bone Joint J* 2015;97-B:1358-1363.

2. **Goyal N, Patel AR, Yaffe MA, Luo MY, Stulberg SD.** Does implant design influence the accuracy of patient specific instrumentation in total knee arthroplasty? *J Arthroplasty* 2015;30:1526-1530.

3. **Meneghini RM, Lovro LR, Smits SA, Ireland PH.** Highly cross-linked versus conventional polyethylene in posterior-stabilized total knee arthroplasty at a mean 5-year follow-up. *J Arthroplasty* 2015;30:1736-1739.

4. **Chen JY, Chin PL, Tay DK, et al.** Functional outcome and quality of life after patient-specific instrumentation in total knee arthroplasty. *J Arthroplasty* 2015;30:1724-1728.

5. **Sakellariou VI, Poultsides LA, Vasilakakos T, et al.** Risk factors for recurrence of periprosthetic knee infection. *J Arthroplasty* 2015;30:1618-1622.

6. **Roth JD, Howell SM, Hull ML.** Native knee laxities at 0°, 45°, and 90° of flexion and their relationship to the goal of the gap-balancing alignment method of total knee arthroplasty. *J Bone Joint Surg [Am]* 2015;97-A:1678-1684.

7. **Lunenburg A, Parratte S, Ollivier M, Abdel MP, Argenson JN.** Are revisions of unicompartmental knee arthroplasties more like a primary or revision TKA? *J Arthroplasty* 2015;30:1985-1989.

8. **Skou ST, Roos EM, Laursen MB, et al.** A randomized, controlled trial of total knee replacement. *N Engl J Med* 2015;373:1597-1606.

Foot & Ankle

X-ref For other Roundups in this issue that cross-reference with *Foot & Ankle* see: [Research Roundup 7](#); [Trauma Roundup 3, 9](#).

Scarf-Akin osteotomy in adolescent hallux valgus **X-ref**

■ The traditional teaching for juvenile and adolescent hallux valgus is to postpone treatment until skeletal maturity. Researchers in **Sheffield (UK)** set out to establish if there is a genuine issue with higher rates of complications such as stiffness and recurrence if the surgery is undertaken before skeletal maturity.¹ The publication concerns 47 feet, all undergoing a Scarf-Akin osteotomy for hallux valgus, all operated on by a single surgeon. Patients were aged around 11 and radiographic measurements were taken from the six-week

radiographs. Results were all acceptable at that stage, however, there were recurrences reported in 14 feet (30%), with one in five symptomatic enough to require revision surgery. Given the high recurrence rates, the authors recommend delaying surgery until skeletal maturity which seems sensible.

Osteochondral defects in the ankle **X-ref**

■ In one of the only large series reporting outcomes of paediatric and adolescent osteochondral defects (OCD) of the ankle, these authors from **Boston (USA)** were able to report the outcomes of 109 ankles in 100 patients.² All patients had an osteochondral defect of the ankle were aged under 18 and had over three years of follow-up. Outcomes

were assessed in terms of return to sport and the Foot and Ankle Outcome Score (FAOS). In this retrospective report of a large number of cases, the commonest lesion was the medial talus (73%) and the majority of patients were treated with either transarticular drilling (54%), fixation (20%) or microfracture (26%). Re-operation rates were high, with around a quarter of patients requiring a further procedure. Perhaps not quite so much can be gleaned from the patient-reported outcomes, as less than half the patients responded to the survey. However, for what it's worth, 82% of respondents were satisfied with their outcome and 84% returned to sport. The authors were able to comment with a reasonable degree of certainty that female

patients and those with a high BMI were likely to have poorer outcomes with the FAOS score.

Inflammatory cytokines and matrix metalloproteinases in ankle fracture **X-ref**

■ The aetiology of arthritis in general is still a mystery, with a clear attributable cause in only a handful of cases. In the ankle, post-traumatic degeneration is a common cause and is often witnessed despite anatomical reduction and expedient treatment of osteochondral defects. Although the cause is understood, the mechanism is not. Investigators from **Durham (USA)** propose a role for inflammatory cytokines in the mediation of post-traumatic osteoarthritis in this elegant study,³ although in itself this is nothing new

and has been described in the post-ACL rupture population. Their basic science study focuses on measuring expression of metalloproteases, interleukins and various cytokines aspirated from injured ankles at an average of 17 days post injury. The opportunity was taken to aspirate the normal side, and differences compared. Despite the small study numbers (normal for this type of expression analysis), the researchers measured some marked differences in the MMP and interleukin levels between joints in the same subjects. This then raises the question: is the die cast at the moment of the initial injury and hence is arthritis in some cases inevitable regardless of intervention? Perhaps not. The authors conclude that articular lavage is a sensible idea after fixation and may yet minimise this process. A longitudinal study would be required to answer that question; this kind of study could well confirm potential novel targets for post-traumatic therapies to reduce the rate and risk of degenerative change.

Ankle and tibia the 'D type' fracture X-ref

■ The optimum treatment of tibial fractures with a synchronous ankle injury remains an unanswered question. Given the variety of fracture patterns in the tibia, and the variety of associated ankle fractures (e.g. some fibula alone, some with medial malleolar components), this is a question that is likely to be difficult to answer and may always be one of 'expert opinion'. However, the occult ankle fracture associated with a tibial shaft fracture is a different beast. Surgeons in **Cheonan (South Korea)** raise the question of surveillance for the occult ankle fracture by describing the incidence and pattern of occult and overt ankle fractures in 77 consecutive patients with tibial fractures.⁴ The study team undertook

CT scanning of the ankles of all patients and collated mechanistic, demographic and fracture pattern information to further describe the injury. Surprisingly, ankle fractures were visible on CT scanning in 64.7% (n = 47). Perhaps predictably, these authors identify the spiral tibial fracture as the morphology most likely associated with an occult posterior or medial malleolar fracture (89% incidence). These authors have a polarised view and come down strongly on the side of CT scanning all patients with tibial fractures. However, we do wonder if the presence of an occult fracture actually makes any difference to management?

If it does not, then obtaining a CT scan just exposes the patient to needless ionising radiation.

Complications of frame treatment for Charcot foot deformity

■ Correction of deformity in the Charcot foot is often fraught with problems, but can be essential in limb pres-

ervation to prevent the accumulation of high plantar pressures resulting in skin breakdown. Jim Brodsky and others have, of late, popularised the use of frames to correct these complex and often resistant deformities, which has raised the obvious concerns of pin site complications and subsequent deep infection. This series from **Loyola (USA)** reports the outcomes of 283 patients, all with Charcot deformity treated with frame-assisted correction over an 11-year period.⁵ All surgery was achieved using a single-stage correction, and a 20% overall pin tract infection rate was reported. This is not dissimilar to complications of frame surgery in non-diabetics, and all settled with oral antibiotics with no requirement for wire removal. This series lends support and reassurance to surgeons undertaking frame correction of the Charcot foot. The



authors highlight the importance of removing skin tension around wires, avoiding the use of half pins and constructs which allow the foot to trampoline on wires. The paper, however, contains no information on outcome or patient satisfaction with this method of correction; that is another question entirely.

Peroneal tendon instability in calcaneal fractures X-ref

■ Peroneal tendon pathology after calcaneal fracture surgery is a significant source of morbidity, and is often unrecognised. Subfibular impingement of the lateral wall blow-out is a well recognised indication for operative intervention, however, instability itself may remain unrecognised at a later stage. Pathology of the tendon system and the need to intervene acutely is a somewhat more controversial area. In an interesting collaboration from **Rochester (USA)**, authors including Roy Saunders present an outcome series study of 155 calcaneal fractures with the aim of assessing the predictive value of tendon displacement on coronal CT as an indication of true disruption of the superior peroneal retinaculum (SPR) assessed at operation.⁶ Crucially, these authors have demonstrated that correlation is poor at best, and that this is probably due to the dynamic nature of the pathology. This is a very clinically useful paper as, on the one hand, it highlights the need to address the peroneal tendons, which changes the operative approach, and an extensile limb to the lateral incision is often needed. On the other hand, it highlights that surgery should not be decided for or against based on the CT findings of the peroneal tendons.

Early weight-bearing following subtalar arthrodesis

■ Isolated subtalar arthrodesis is a common salvage option and can provide reliable pain relief to patients with pain arising from the subtalar joint. While practice among surgeons differs, the majority prefer to limit early weight-bearing to

promote union. However, in some patients the benefit of full loading of the affected limb is self-evident, allowing comorbid or non-compliant patients to achieve a reasonable result with minimal complications. There is rightly concern that this may promote fibrous nonunion at the prepared joint surface due to the torque stresses naturally occurring at the joint which is a product of its morphology, and maximising stability following fusion is a central surgical aim. A team from **Innsbruck (Austria)** has reproduced a cyclical loading model using a cadaveric specimen to perform biomechanical studies of differing screw stabilisation methods.⁷ Using eight paired subtalar joint specimens subjected to 1000 cycles at lower than physiological loads, the researchers tested both an angulated and parallel screw configuration for stability. They have demonstrated that the classic parallel screw technique yields significantly higher motion on cyclical testing than that measured at an interface bridged by two angled screws. The angled screw technique involves the standard inferior to superior screw with a start point on the posterolateral calcaneal tuberosity, but in addition includes a further, shorter screw capturing the anterior facet into the head of the talus. Even though only two possible configurations were considered, this does give some guidance for the surgeon who needs (often due to patient-centred factors) to allow a patient to weight-bear slightly earlier than might be ideal.

The tricky arthroscopic ankle arthrodesis: is it feasible to sneak in the back?

■ Arthroscopically assisted ankle arthrodesis offers many benefits, one being that in patients with poor soft tissues or profound diabetes, the soft-tissue complications are much less common than with open approaches. On occasion, however, a patient will present requiring an ankle fusion but the anterior soft-tissue envelope is not

suitable for surgical wounds, even arthroscopically. The posterior ankle portal is rarely used in routine ankle arthroscopy due to perceived technical difficulty and the risk of iatrogenic injury to neurovascular and tendinous structures. The group from CHU in **Rouen (France)** present a feasibility study for arthroscopic ankle arthrodesis using an entirely posterior approach to the joint.⁸ Ten cadaveric specimens underwent fusion and were dissected afterwards to look for injury to structures around

the ankle. None is reported in this small series, with an average operative time of 45 minutes. Operating in the real-life setting will inevitably be more time-consuming, but this study nicely demonstrates the feasibility of this method, to prepare the ankle via the posterior approach if needs be.

REFERENCES

1. **Agrawal Y, Bajaj SK, Flowers MJ.** Scarf-Akin osteotomy for hallux valgus in juvenile and adolescent patients. *J Pediatr Orthop B* 2015;24:535-540.

2. **Kramer DE, Glotzbecker MP, Shore BJ, et al.** Results of surgical management of osteochondritis dissecans of the ankle in the pediatric and adolescent population. *J Pediatr Orthop* 2015;35:725-733.

3. **Adams SB, Setton LA, Bell RD, et al.** Inflammatory cytokines and matrix metalloproteinases in the synovial fluid after intra-articular ankle fracture. *Foot Ankle Int* 2015;36:1264-1271.

4. **Jung KJ, Chung CY, Park MS, et al.** Concomitant ankle injuries associated with tibial shaft fractures. *Foot Ankle Int* 2015;36:1209-1214.

5. **Ketz JP, Maceroli M, Shields E, Sanders RW.** Peroneal tendon instability in intra-articular calcaneus fractures: a retrospective comparative study

and a new surgical technique. *J Orthop Trauma* 2015. (Epub ahead of print)

6. **Finkler ES, Kasia C, Kroin E, et al.** Pin tract infection following correction of Charcot foot with static circular fixation. *Foot Ankle Int* 2015;36:1310-1315.

7. **Eichinger M, Schmölz W, Brunner A, Mayr R, Bölderl A.** Subtalar arthrodesis stabilisation with screws in an angulated configuration is superior to the parallel disposition: a biomechanical study. *Int Orthop* 2015;39:2275-2280.

8. **Malekpour L, Rahali S, Duparc F, Dujardin F, Roussignol X.** Anatomic feasibility study of posterior arthroscopic tibiotalar arthrodesis. *Foot Ankle Int* 2015;36:1229-1234.

Wrist & Hand

X-ref For other Roundups in this issue that cross-reference with *Wrist & Hand* see: [Oncology Roundup 3](#); [Paeds Roundup 5](#).

The occult scaphoid fracture: a costly diagnosis?

■ Sometimes in life, one has to spend more to save in the longer term. This is one of the central dogmas of evaluation of screening tests, which is essentially what the use of advanced imaging modalities is when applied to scaphoid fractures in patients with a suggestive history. The question of course is, does early imaging work from a cost-effectiveness perspective? In a very useful cost-effectiveness analysis, researchers in **New York (USA)** have set out to determine if use of cross-sectional imaging is justified in patients at risk of a scaphoid fracture.¹ As has become the gold standard in recent years, this analysis is not based on a series of patients and retrospective 'bean counting', but a more elegant computational approach. The investigators used previously published data to generate a decision analysis model. The model was able to take into account three possible management strategies: empirical cast management, immediate CT or MRI scanning. The investigators used published data concerning costings, incidence of

fracture diagnosis by each modality and the surgical and societal costs of missed fractures using each strategy. Using this decision model, cross-sectional imaging had a 'break even' point for cost effectiveness of \$2000 per patient. Given that the cost in many institutions is around \$500 for MRI and less for CT, the use of early cross-sectional imaging is wholly appropriate from a health-economic perspective.

Kienbock's an enigmatic disease

■ Kienbock's disease is an enigma, even to the hand surgeon! The cause is not really known and the best treatment has not been established. Even worse, we do not really know its clinical relevance. Researchers from **Boston (USA)** have designed a radiographic review to establish the prevalence of Kienbock's disease.² The researchers undertook a retrospective imaging review (using reporting) of over 51 000 radiographs and scans and found Kienbock's disease in 0.27% of imaging studies. In these cases the radiographs and clinical notes were reviewed, establishing an overall prevalence of 0.10% asymptomatic and 0.17% symptomatic disease in the general population. Within the limits of the retrospective nature of the study design, the authors were

unable to establish a relationship between symptoms and Lichtman stage, reminding us that it is wise, as very often in orthopaedics, to consider the patients, not the radiograph.

Warfarin and hand surgery

■ Knowing how to manage perioperative anticoagulation can be tricky. Patients may take warfarin for various reasons and while sometimes it can be stopped safely and temporarily before surgery, at other times even temporary cessation can be life threatening. It is therefore important to balance the medical risks of curtailing warfarin with the surgical risks of continuing (for example haematoma, infection). Researchers from **St Louis (USA)** undertook a matched cohort study to try and establish the balance of risks with simply continuing warfarin prior to hand surgery.³ They undertook a matched case series with 50 hand surgery patients who continued pre-operative warfarin with 50 age-/procedure-matched controls who were normal. Outcomes were assessed in terms of peri-operative complications, and established using a retrospective chart review in addition to DASH and pain/swelling VAS scores. The authors determined that there was a significant increase in the risk of haematoma formation in those

patients taking warfarin, although the requirement for re-operation was very unusual. Caution and proper risk assessment remains essential for those on powerful anticoagulants who are in need of hand surgery.

Predicting recurrence following injection for carpal tunnel syndrome

■ Surgeons like to operate and carpal tunnel release is probably the most common operation that hand surgeons perform. But do patients always need surgery? A group in **Boston (USA)** and **San Francisco (USA)** report their outcomes having injected 49 patients' symptomatic carpal tunnels with steroid.⁴ A comprehensive patient history and demographic information were collated prior to administration of the injection, and outcome scores were reported at regular intervals until 12 months of follow-up, primarily using the Boston Carpal Tunnel Questionnaire. The headline result was that 31% of patients were still symptom-free at 12 months, however, recurrence was 2.5 times more likely in diabetics. Although these results are not awe-inspiring in terms of recurrence rates, given the simple and complication-free nature of a single steroid injection when compared with carpal tunnel release, we wonder here at 360 if