

ROUNDUP³⁶⁰

Foot & Ankle

Soft-tissue pain following arthroplasty

■ Unexplained post-operative pain is well described for hip and knee replacements, and while a recognised complication of total ankle replacement (TAR), the literature describing the pathogenesis, aetiology and treatment is much more scarce. This is due in part to the relative rarity of the procedure. Researchers in **Incheon (South Korea)** describe a prognostic study of 120 patients, assessing the incidence of persistent pain following otherwise uncomplicated TAR. The investigators judged post-operative outcomes using a visual analogue scale (VAS) for pain and rescored the nature, location and aggravating factors of the pain. In the majority of cases (115/120) the pain intensity decreased following surgery to a mean of 2.7 at post-operative follow-up. The most common aggravating factor was increased activity levels, with nearly 70% of patients reporting walking for > 30 minutes the greatest factor. The most common pattern of discomfort was dull (55%) and medial sided (47%) pain. In a small subgroup of seven cases a subsequent arthroscopy was performed as both a therapeutic and diagnostic procedure. In all cases local symptoms resulted in a VAS score of seven or more. Although a very small selected subset of patients, the authors report they were able to confirm fibrosis and synovitis in all cases, and following arthroscopic debridement there was a mean improvement in the VAS from seven

to three. The authors conclude that based on these results post-operative pain is not an infrequent occurrence following TAR. They also hypothesise that 'soft-tissue impingement is a possible cause'.¹ While we welcome this informative study of pain following ankle replacement we were not quite as broad in our conclusions. The authors present a high incidence of post-operative pain and, based purely on a selected cohort of just seven patients, imply a causal relationship between impingement and pain. Based on the data presented it is certainly possible to say that at least a small proportion of post-operative TAR pain is impingement-related, but sadly the authors do not provide robust data to support their assertion.

Pigmented villonodular synovitis of the foot and ankle

■ Pigmented villonodular synovitis (PVNS) is a locally aggressive but benign tumour of the synovium, commonly described in the knee. Surgeons from **Oswestry (UK)** report the mid-term outcomes of PVNS treatment in the foot and ankle. The research team collated their nine-year experience with 18 cases of diffuse PVNS treated within the foot and ankle, and reported it as a retrospective case series (Level IV evidence). This case series spans a mean follow-up of five years (2 to 11.8) and includes a preponderance of women (11 *versus* 7). As would be expected in this kind of case series, a variety of treatment modalities were used, however, 13 patients (76%)

underwent a surgical debridement without adjuvant radiotherapy. The surgical team only offered surgery to those patients presenting with symptomatic lesions. The remaining 24% were managed conservatively. By the time of final follow-up the surgical team had been able to achieve an impressive 94% function (graded by the Musculoskeletal Tumour Society scale) and mean of 89 points on the AOFAS score.² All in all this is an informative series; the authors present long-term outcomes of a relatively rare lesion effectively demonstrating that a targeted synovectomy (either open or arthroscopic) provides effective control for diffuse PVNS of the foot and ankle. To our knowledge this is the first report detailing long-term clinical outcomes of this rare lesion.

Ankles, allograft and arthritis

■ Scarcely a page goes by (let alone a whole issue) of *360* without reference to joint-preserving biologic therapies. The panoply of joint-preserving treatment options available to the modern surgeon include stem cells, platelet-rich plasma, scaffolds, chondrocyte implantation, and there are even the beginnings of studies into plasmid gene therapies. Researchers in **La Jolla (USA)** have taken a fresh look at a massive osteochondral grafting using bipolar allografts to treat osteoarthritis of the tibia (replacement of both the tibia and talus with matched massive allografts). Arguing that there is limited evidence to support biologic therapies in

advanced osteoarthritis and citing poor results for both arthroplasty and fusion in the young age group, the research team set about examining the potential benefits of bipolar tibiotalar allograft transplantation. Over a nine-year period the surgical team performed 86 procedures in 84 patients, the majority of whom were young (mean age 44 years). Outcomes were evaluated using clinical scoring (Olerud & Molander score (O&M), pain, satisfaction and function scales). Radiological and re-operation end points were also evaluated with standardised radiographs used to evaluate graft incorporation, incidence of collapse and joint space narrowing. At a mean of five years (2 to 11) just under a third of grafts had failed (seven revisions, seven arthrodesis, seven arthroplasties and two amputations). The functional outcomes were good with high rates of satisfaction (92%) and improvements in pain (85%) and function (83%). In a further 13% of patients, additional small surgeries were required (synovectomy and debridement).³ The authors of this interesting series conclude that "transplantation of a bipolar ankle allograft is a useful alternative in carefully selected patients with advanced tibiotalar arthritis". While we would wholeheartedly agree that these are difficult to treat patients and that survival rates of 76% at five years are encouraging, we would inject a note of caution. Before dashing off to implant our first bipolar grafts we would have to consider

the 3% amputation rate – certainly a very major complication – especially when taken in conjunction with the low 44% ten-year survival rate. This paints a bleak picture for the mid- to long-term results of such surgery. Maybe this tricky problem is not quite solved yet.

Open calcaneal fracture: amputation or salvage?

■ The calcaneal fracture is a difficult diagnosis stuck in a quagmire of conflicting evidence; even for the most experienced of surgeons this diagnosis will make your heart sink. Perhaps one of the worst prognosticators is that of the open calcaneal fracture with a high rate of complication and often resulting infection. Reports in the literature are few and far between and there is little evidence on which to make treatment decisions. What is a rare diagnosis in civilian practice has become a common problem in the battlefields of Afghanistan and Iraq. Improvised explosive devices placed under armoured vehicles commonly cause high energy open fractures. Surgeons in **Bethesda (USA)** designed a retrospective prognostic study (Level II evidence) with the aim of establishing the prognosticators for a good functional result in over 100 combat-related open calcaneal fractures. Using a Cox proportional hazards model with amputation as the end point, the team were able to establish the prognostic factors associated with a good result. A total of 102 open fractures (89 patients) were recruited into the study and the prognostic value of demographic, injury and wound factors were established. As would be expected by the final (four-year) follow-up, over 40% of patients had undergone an amputation (15 of whom underwent delayed amputation). Predictors of amputation were a blast injury, plantar wound, larger open wound and increasing Gustilo Anderson score. Counterintuitively, however, those who had sustained more major injuries had lower pain scores (2.1 *versus* 4.0 on the VAS for pain) and had higher Tegner activity levels (5.4 *versus* 3.5), both of

which were significant differences.⁴ This has to be one of the most useful papers we have read recently, here at 360; it clearly describes the prognostic factors and outcomes of a very rare injury in a series of over 100 cases. Much like other studies with higher functional scores associated with amputation, we do, however, wonder how these scores might change over the longer period of time as the patients get older and find their prosthesis more difficult to manage.

Osteochondral lesions in the longer term

■ The majority of studies examining the potential benefits and effects of osteochondral lesion treatments have relatively short follow-up (often of just one year) and at least one outcome measure is that of degenerative change. Here at 360 we find this curious. Given that post-traumatic osteoarthritic change takes years to develop, surely a longer-term outcome measure is required? Researchers in **Amsterdam (The Netherlands)** were thinking along the same lines and designed a retrospective cohort study (Level IV evidence) to examine the long-term outcomes of arthroscopic debridement and marrow stimulation (microfracture) as a tactic for treating osteochondral defects of the talus. They were able to report the results of 50 patients at a mean follow-up of 12 years (8 to 28). Patients were evaluated at the time of the study and clinical evaluation was undertaken (Ogilvie-Harris score, Berndt and Harty question, American Orthopaedic Foot & Ankle Society (AOFAS) and Short Form-36 (SF-36) questionnaires), and demographic and lesion details recorded. The development of osteoarthritis was assessed with ankle weight-bearing radiographs. Outcome questionnaires found around 75% of patients to have a good or excellent result (Ogilvie-Harris and

Berndt and Harty) with patients achieving a median AOFAS score of 88. Perhaps most impressively, over 90% of patients had resumed work and sports. The osteoarthritis grade progressed in just over a third of patients and the authors were unable to identify any potential prognostic factors for the progression of radiological osteoarthritis.⁵ The data presented in this manuscript is hugely reassuring for patients and clinicians alike. It should be considered that there is no comparison group and as such it is impossible to assert that the intervention (microfracture) has had any effect on the long-term outcomes of these patients. As it stands, this is valuable and encouraging data for marrow stimulation techniques.

Severe infections in diabetic feet

■ Foot infections can be difficult to treat at the best of times, however, in the diabetic patient severe infections may be limb threatening. As the obesity epidemic continues unabated, the tidal wave of diabetic-related complications continues in all medical specialities.

Researchers in **Pittsburgh (USA)** designed a database study with the aim of establishing the rates of amputation and limb salvage in patients with severe diabetic foot infections (DFI). Their study was based on the records of 100 patients

treated on an inpatient basis over a five-year period, and severe infections were defined as a presentation of DFI in the presence of two or more objective findings indicating metabolic instability or systemic toxicity. The research team identified that a severe infection was associated with a hospital stay of more than three days and a lower rate of limb salvage (55% *versus* 42% amputation rates).⁶ It is clear from this study that the disease burden associated with even less severe DFI is not to be underestimated.



Absorbable first ray fixation

■ Forefoot and first ray surgery is often complicated by the need for the removal of fixation due to soft-tissue irritation, necessitating a second surgery. The development of bioabsorbable fixation provides the attractive option of no need for fixation removal, but offers potential risks of compromised early fixation and osteolysis, sometimes seen surrounding these devices. A study from **Milan (Italy)** evaluating the utility of bioabsorbable pins in forefoot surgery caught our interest. The authors conducted a prospective comparative case series of 439 cases of chevron osteotomy conducted over a five-year period for a hallux valgus deformity. In 285 feet a bioabsorbable polylactide pin was used to fix the osteotomy while in 154, stabilisation was achieved using a screw. The patients were followed up for over two years and outcomes assessed using radiological (intermetatarsal angle, hallux valgus angle), clinical scores (AOFAS score) and complication rates.⁷ There was no difference in any outcome measure between the study and control groups with both achieving significant improvements in AOFAS scores and radiological outcomes. The authors did not note any adverse reactions or early loss of fixation with the bioabsorbable pins and conclude not unreasonably that “fixation with a bioabsorbable pin was as reliable as fixation with a metal screw and allowed major angular corrections”. The authors have certainly made a compelling argument with a well-designed study for fixation of first ray surgery with absorbable pins.

Showering after foot surgery

■ Some simple questions are difficult to answer. In foot and ankle surgery where infection rates are relatively high the avoidance of infection is a fine balance between leaving wounds undisturbed and the increased cleanliness offered by bathing. It is commonplace to advise patients to keep wounds clean and dry until the removal of sutures in an attempt to reduce infection rates. However, it is unclear what

post-operative protocol the evidence actually supports. Researchers in **Fort Dodge (USA)** have performed a systematic review with the aim of establishing the evidence base for post-operative cleanliness regimes. The study team identified nine studies reporting the results of 2150 patients and containing suitable data to answer the study question “is it OK to allow wounds in the foot and ankle to get wet prior to removal of sutures”. The answer appears

to be short and sweet; the authors conclude that based on the available data it is acceptable to both shower and bathe prior to removal of sutures and does not result in an increase in infection rates.⁸

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