

# ROUNDUP<sup>360</sup>

## Foot & Ankle

*For other Roundups in this issue that cross-reference with Foot & Ankle see: [Hip & Pelvis Roundup 8](#); [Trauma Roundup 7](#); [Oncology Roundup 8](#); and [Research Roundup 5 and 6](#).*

### Charcot feet, biomarkers and diabetes

■ One of the most catastrophic complications of established diabetes is the involvement of the feet, and specifically the development of Charcot feet. In combination with the associated neuropathy, Charcot changes can result in ulceration, osteomyelitis and, if left untreated, amputation. The difficulty is that, as with many diabetic complications, the diagnosis can be tricky and operative intervention during early Charcot changes can make the condition considerably worse.<sup>1</sup> Given the current explosion of biomarkers it is surprising to us here at 360 that they have not been explored in the prediction of Charcot changes. Researchers in **London (UK)** have, however, taken this forward and report a cross-sectional study of 69 people (35 with Charcot arthropathy) attempting to establish the value of serum inflammatory and bone turnover markers in the diagnosis of infection. The comparator group consisted of 12 non-diabetic and 22 diabetic controls. The research team collected serum samples and measured a huge range of candidate biomarkers across the cohorts. They established that higher levels of expression were seen in HS-CRP, TNF $\alpha$ , IL-6 and IL-1B on presentation

with Charcot arthropathy. Expression of Serum C-terminal telopeptide, bone ALP and osteoprotegerin were suppressed in the Charcot group. There were no differences between controls and the study group for tartrate resistant ALP or NFK-B. While many of the biomarkers remained abnormal throughout the duration of the study, the expression of TNF- $\alpha$  and IL-6 was found to mirror disease activity, slowly falling towards more normal levels as the inflammatory phase settled. This response to therapy was not seen in the other biomarkers. This paper is potentially exciting with the suggestion that two commonly measured biomarkers might be not only useful diagnostic tools, but also able to monitor the effectiveness of therapy and disease progression in patients with Charcot arthropathy. We would like to see this taken further with a much larger clinical study to define the sensitivity, specificity and responsiveness of these measures.

### Weight bearing following Achilles tendon rupture x-ref Trauma

■ Rehabilitation strategies following Achilles tendon rupture have been the focus of much research interest. There is little in the way of consensus concerning operative or non-operative management methods, although most clinicians agree that early weight bearing is better for the patients from a convenience point of view at least. It also seems intuitively likely that

early weight bearing would improve functional outcomes, improving muscle strength and decreasing re-rupture rates. However, there is no conclusive evidence to support this supposition. To this end researchers in **Hvidovre (Denmark)** set about establishing the utility of their early dynamic rehabilitation protocol by testing it in a randomised controlled trial against a standard regime.<sup>2</sup> The clinical trial involved a small sample of just 60 patients who were randomised to either initial fully weight bearing or non-weight bearing for six weeks. Both groups were managed with controlled early motion. Outcomes were assessed with the Achilles Tendon Total Rupture Score (ATRS) at one year with secondary outcome measures of health-related quality of life scores, re-rupture rate and ability to heel-rise. Outcome assessment was available for 29 weight bearing and 27 non-weight bearing patients. The only difference in outcome measures at 12 months of follow-up was a better health-related quality of life; there were no differences in Achilles tendon score, heel-rise work or re-rupture rates. Although there were few differences between the groups there was a substantial functional deficit in the injured limb in both groups.

### Endobuttons and mal-reduced diastasis

■ There has been plenty in the orthopaedic literature in recent years describing the difficulties of achieving a good reduction of

the distal tibiofibular joint and the conundrum of removal, or not, of diastasis screws. Various studies have investigated the differences between routine removal of syndesmosis screws and how functional outcomes are assessed both by mal-reduction and retention of position screws. Researchers in **Iowa City (USA)** performed a cadaveric study investigating the effects of mal-reduction of the distal fibula and fixation with either a screw or endobutton and the effects on maintenance of reduction.<sup>3</sup> The study team investigated the potential effect with 48 fixations on 12 cadaveric specimens. They produced a mal-reduction in either an anterior or posterior direction and then undertook fixation with either screw followed by exchange for an endobutton, or endobutton followed by exchange screw fixation. The study team then undertook CT scanning to establish the maintenance (or otherwise) of the mal-reduced position. When an anterior mal-reduction was effected there was significantly less translation in the sagittal plane with the endobutton fixation (2.7 mm vs 1.0 mm). This was exaggerated with posterior mal-reduction to 7.2 mm and 0.5mm, respectively. While the authors readily acknowledge that there is no clinical data presented here, and therefore the differences in reduction can only be extrapolated to genuine clinical scenarios, there is, however, no doubt that better reduction is to be preferred to poorer reduction.

## Evidence for stem cell therapies in osteochondral lesions of the talus

### x-ref Trauma

■ A relatively common but under diagnosed injury, osteochondral lesions of the talus are seen both with ankle sprains and fractures. They are known to be associated with poor outcomes when located on the weight-bearing dome of the talus and as yet there is little in the way of acceptable management for these injuries. One of the ‘trendier’ orthopaedic interventions of late is stem cell therapy (covered extensively previously in 360) but there has been a lack of decent quality evidence to support the use of stem cells in osteochondral defects. Researchers in **Bologna (Italy)**, reasoning that this is an area ripe for research, designed a study to compare bone marrow-derived cells implanted in a collagen matrix with and without biophysical stimulation with pulsed electromagnetic fields.<sup>4</sup> We were bemused to see a control group and intervention group with two equally unproven interventions! However, undaunted, the research team recruited 30 patients, all with grade III or IV lesions. Patients were treated in an identical manner during operation, with a collagen scaffold impregnated with bone marrow-derived cells harvested from the patient’s ilium and implanted arthroscopically. Patients were randomised to either pulsed electromagnetic field (PEMF) for four hours a day or for 60 days to a control group, and primary outcomes were assessed using the AOFAS score, with other outcomes of VAS score and SF-36. The authors were able to report significant differences in both the AOFAS and VAS pain scales at both six and 12 months

of follow-up, indicating superior clinical outcomes in the experimental group *versus* control group. While this study does not really answer the question, ‘is stem cell therapy worthwhile in osteochondral defects around the talus?’, it does tell us that if undertaking stem cell therapy, it is wise to use adjunctive PEMF with the aim of encouraging improved clinical outcomes.

### Syndesmosis fixation in SER ankle fractures

■ Supination external rotation injuries are characterised by disruption of the syndesmosis and diastasis of the distal tibiofibular joint, potentially leaving the ankle unstable. There is some discussion as to the need for syndesmosis screw placement. There is a credible argument that with appropriate rigid internal fixation and most operative immobilisation in a plaster cast, a syndesmosis screw may not be required. Researchers in **Oulu (Finland)** have set out to establish if a syndesmosis screw is really required.<sup>5</sup> They operatively treated 140 supination-external rotation type IV fractures, all of which were screened for suitability for inclusion in their study. After fixation just 24 patients still had a diastasis on stressing and were therefore suitable for inclusion in the study. Eleven patients were randomised to no screw transfixion and 13 to screw transfixion. Outcomes were assessed at a minimum of four years’ follow-up with the primary outcome measure of the Olerud-Molander score. While all groups improved over the course of the

study with respect to all outcome measures, there were no differences between the groups in outcome scores or radiographic outcomes. Although this study is limited by the number of patients (and, rather annoyingly, the authors report the screened number of 140 as being enrolled) it does not show any differences between the two groups.

### Self-reporting for foot and ankle outcomes

■ Although PROMS and patient-reported outcomes are all the rage across all orthopaedic specialties, they do add potentially to the burden of both time and administrative resource in the clinical setting. To make matters worse many validated scores are involved and often require up to 30 minutes of the patient’s (and sometimes the clinician’s) time to report. Researchers in **Linköping (Sweden)** set out to validate the Self-reported Foot and Ankle Score (SEFAS) against the gold standard of the American Orthopedic Foot and Ankle Society Score (AOFAS) which is a clinician-reported score.<sup>6</sup> The aim was to establish the properties of these two scoring systems. The study team recruited 206 patients with a mixture of forefoot (95) and hindfoot (111)



disorders of various varieties and administered both scoring systems to the patients. They evaluated the properties of the scores including concordance between the scores, the intra- and inter-observer reliabilities, floor and ceiling effects, as well as estimations of responsiveness by evaluating effect sizes. The SEFAS was three times quicker to

administer than the AOFAS and there was both a significant correlation and lack of floor or ceiling effect in both scores. The SEFAS was much more consistent on retesting (one-week interval) than the AOFAS with intraclass correlation co-efficients for forefoot disorders (0.57 and 0.70, respectively) and hindfoot disorders (0.75 and 0.86, respectively). This nice, straightforward study establishes the responsiveness of the two scores to change, and highlights the utility of the SEFAS, particularly with regard to patient burden, taking only one third of the time to complete and providing similarly useful results.

### REFERENCES

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