

ROUNDUP³⁶⁰

Trauma

For other Roundups in this issue that cross-reference with Trauma see: [Hip & Pelvis Roundup 4](#);

[Frot & Ankle Roundups 2 and 6](#); [Wrist & Hand Roundups 4 and 6](#); [Shoulder Roundups 1, 2, 3 and 7](#); [Spine Roundup 3](#); [Children's orthopaedics Roundup 5](#); and [Research Roundups 1, 5 and 6](#).

Evaluating the syndesmosis in ankle fractures

x-ref Foot & Ankle

■ The simple aim of anatomical reduction and fixation with absolute stability can be complicated in the ankle joint by syndesmotic injury. Restoration of the fibular anatomy does not always restore articular congruity with talus luxation still possible in some Weber B and Weber C fracture patterns. On-table assessment of syndesmotic stability is still the gold standard, and much debate surrounds how best to stabilise an unstable syndesmosis (single or multiple screws, flexible fixation, removal or not); however, despite the renewed interest in the humble syndesmosis screw, surprisingly little has been written surrounding the evaluation of joint stability. We were interested to read this study from investigators in [Baltimore \(USA\)](#) which has the potential to standardise practice when stressing the ankle joint complex, reasoning that it is commonplace to stress the ankle using either an external rotation test on the talus or a direct lateral pull (often achieved with a bone hook). The researchers conducted a prospective diagnostic

cohort study using a series of 28 consecutive patients, all of whom presented with unstable ankle fractures. The research team performed both the lateral pull and external rotation stress view intra-operatively. Outcomes were assessed using the usual radiographic measurements of tibiofibular clear space and medial clear space and tibiofibular overlap.¹ The authors were unable to find any differences in the incidence or magnitude of tibiofibular clear space or tibiofibular overlap, although there were differences in medial clear space widening (with a 37% increased incidence). The authors comment that this difference essentially amounts to 2 mm of medial clear space widening with stress external rotation. Although this is an interesting observation and we would agree with the authors that, untreated, unstable ankles are clearly not an ideal place to be, however things are not quite as clear cut as they suggest. It is far from clear that these differences are clinically relevant from the data presented. These two tests are fundamentally different; one testing the torsional stability of the ankle with a lever of the talus against the medial side, and the other implying straight translation. A very interesting observation but we have difficulties here at 360 with the comparison of two fundamentally different tests. We do not know from the data presented which is associated with clinically relevant instability requiring a syndesmosis screw.

Calcaneal fracture management an ongoing problem

x-ref Foot & Ankle

■ The treatment of calcaneal fractures continues to perplex even the most experienced of treating surgeons. While the majority of senior surgeons will be the first to expound their own particular treatment algorithm, most will also happily admit that the evidence is at best mixed and certainly contradictory and confusing. Buckley and collaborators from the [Canadian Orthopaedic Trauma Society \(Canada\)](#) have published a long-awaited study evaluating the utility of ORIF *versus* ORIF with fusion in a sever subgroup of Sanders IV calcaneal fractures. They conducted a large scale prospective, well-controlled, randomised trial in four Canadian level-1 trauma centres. Their study population consisted of 31 patients with Sanders IV fractures; outcomes were assessed using four measures (all validated): the SF-36; Musculoskeletal Functional Assessment Survey; American Orthopaedic Foot and Ankle Society's Ankle-Hind-foot Scale; and the Visual Analogue Scale. Patients were all treated with a laterally-based approach for calcaneal ORIF. Of the 14 patients randomised to fusion, a primary subtalar fusion was also performed. Outcomes were assessed at a minimum of two years post-operatively where an 81% follow-up rate was achieved. The authors were unable to demonstrate significant differences in any primary or secondary

outcome measure at their two-year follow-up. The authors conclude that with no functional differences between the two approaches, it should be the surgeon's choice, although if a fusion is performed, the requirement for late secondary intervention is probably reduced.² This study adds quite a lot to what we already know and supports the findings of the UK Heel Fracture Trial in that treatment outcomes do not appear to be affected by subtalar arthrosis either because the outcome instruments are not sensitive enough, or more likely that the function of the subtalar joint does not really contribute to outcomes in this patient population. What we desperately need is a well-conducted, randomised controlled trial comparing operative and non-operative treatment with sensible inclusion criteria.

Angular stable locking in low tibial fractures did not improve results

■ The low tibial fracture is a challenge to treat. Fractures below the metaphyseal flar are often too proximal to plate easily, yet too distal for a traditional nail to provide adequate stability. There have been a number of innovations in technology in attempts to address this, and perhaps one of the most innovative is the development of an angular stable locking system for intramedullary nailing. The system consists of a titanium screw and a threaded biodegradable polylactic acid sleeve that allows for angular stable distal as well as proximal locking in tibial nailing. Investiga-

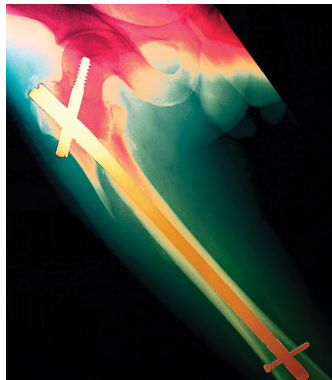
tors in this multicentre study from **Germany, Norway and Austria** undertook a randomised, patient-blinded trial of angle stable *versus* traditional locking in patients with distal tibial fractures. Interestingly, the authors selected time to full weight-bearing with minimum pain as their primary outcome measure, reasoning that the increased stability may improve rehabilitation. Outcomes were assessed at regular intervals with up to a year of follow-up, and secondary outcome measures including pain at the fracture site, quality of life, gait analysis, mobility, radiographic findings, and adverse events were also recorded.³ A total of 142 patients were successfully recruited and randomly allocated to the two different treatments. Unfortunately, the randomisation was not even, with 67 in the conventional nailing group and 75 in the angular stable group. However, despite some limitations to the study design the authors found no clinically important differences for either the primary or secondary outcome parameters between the two treatment groups. While angular stable locking of intramedullary nails has been shown to enhance fixation stability of tibial fractures in biomechanical and animal studies, in this randomised clinical study the investigators did not find any significant benefit from use of this new technology – perhaps a solution without a problem?

Open fractures: do the seconds really count?

■ Orthopaedic dogma is strong surrounding open fracture management based on what appears to be a common sense approach to the treatment of the severe end of the fracture range. For many years, patients with open tibial fractures have been treated as having a limb threatening emergency whatever time of day or night they present. There has been a shift away from this rigid approach recently with recognition in both research papers and national guidance that many open fractures do not represent the emergency they were previously thought to be and that

rapid appropriate surgery from an experienced surgical team may result in better outcomes than earliest possible care. There are few large, well-conducted studies evaluating these processes, and we were delighted to read this prospective cohort study from **Alberta (Canada)** reporting the results of three level-1 Canadian trauma centres. Investigators utilised historically collated data to evaluate any potential association between time to surgery, antibiotic administration, Gustilo grade, fracture location, and development of deep infection in open fractures. In one of the largest studies on open fractures, a total of 736 patients with 791 fractures were enrolled in the study and

investigators were able to include 93% of patients who had adequate follow-up available. The overall infection rate was 6% of fractures (46 cases) and in their series the median time to surgery was nine hours four minutes in patients that did not develop infection, and seven hours 39 minutes for those that did – a significant difference. In the infected cohort around a third (37%) were Gustilo grade 3B or 3C fractures. The authors undertook a multivariate regression analysis with the aim of establishing the potential for any association between infection and time to surgery (odds ratio (OR), 0.97; 95% confidence interval 95% CI], 0.90–1.06) or antibiotics (OR, 1.0; 95% CI, 0.90–1.05).⁴ Infection after open fracture was associated in this series with increasing Gustilo grade or tibial/fibular fractures, but was not associated with the time to surgery or timing of antibiotic administration. This study underlines and provides evidence to support current practice of early appropriate debridement by experienced surgeons.



Long-term outcomes of tibial fractures

■ Although relatively common injuries, the outcomes of tibial shaft fractures in the longer term have never been adequately studied. One might expect the currently available follow-up of five years to represent a suitably long endpoint for healed long bone fractures. However, reasoning that perhaps outcomes change in the longer term, researchers from

Edinburgh

(UK) report the outcomes of 568 tibial fractures from a cohort of 1502 on their trauma database. Outcomes were assessed using the SF-12 score, and correlated to potential covariates such as requirement for fasciotomy

(a very high 11% rate reported in this series), incidence of complications, injury type and occurrence of knee or ankle pain.⁵ Interestingly, in this series there was no association between the requirement for fasciotomy and poorer long-term functional outcome. Social deprivation indices were poorer than would be expected, suggesting an association between incidence of injury and deprivation, but did not affect long-term functional outcomes. In the longer term, around half of patients reported ongoing knee pain (26%), ankle pain (10%) or both (17%). There were no major marked differences in these very long-term outcomes from those reported elsewhere for mid-term results, which is reassuring.

Targeted performance improvements in pelvic fractures

■ We describe the impact of a targeted performance improvement programme and the associated performance improvement interventions on mortality rates, error rates and process of care for

haemodynamically unstable patients with pelvic fractures. The clinical care and performance improvement data for 185 adult patients with exsanguinating pelvic trauma presenting to **Royal London Hospital (UK)** between January 2007 and January 2011 were analysed with univariate and multivariate regression, and compared with national data. In total, 62 patients (3.4%) died from their injuries; opportunities for improved care were identified in one third of deaths. Three major interventions were introduced during the study period in response to the findings. These were a massive haemorrhage protocol, a decision-making algorithm and employment of specialist pelvic orthopaedic surgeons. Interventions which improved performance were associated with an annual reduction in mortality (odds ratio 0.64 (95% confidence interval (CI) 0.44 to 0.93), $p = 0.02$), a reduction in error rates ($p = 0.024$) and significant improvements in the targeted processes of care.⁶ Exsanguinating patients with pelvic trauma are complex to manage and are associated with high mortality rates; implementation of a targeted performance improvement programme achieved sustained improvements in mortality, error rates and trauma care in this group of severely injured patients.

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