ROUNDUP360

Foot & Ankle

For other Roundups in this issue that cross-reference with Foot & Ankle see: Trauma Roundups 1, 2 and Children's orthopaedics Roundup 8.

Syndesmosis screw removal in randomised controlled trial

The pendulum keeps swinging in the debate surrounding syndesmosis screw removal. Hot on the heels of a number of anatomic case-controlled studies in recent years suggesting an anatomical advantage to removing syndesmosis screws comes a well conducted randomised controlled trial from **Christchurch (New Zealand)**. The authors hypothesised that at one year of follow-up there would be no difference between removal of and retention of the syndesmosis screw. They designed a well-conducted, randomised controlled trial to compare outcomes at one year of follow-up between removal and retention of the syndesmosis screw. Their study inclusion criteria were patients with surgically treated ankle fractures requiring syndesmosis stabilisation. The participants were randomly assigned to screw retention or removal at three months post-operatively and the two groups were comparable at recruitment from a demographic perspective. The primary outcome measure was the Olerud-Molander score with secondary outcome measures of the AOFAS score, VAS pain score and active dorsiflexion range. The study team recruited 51 patients who successfully participated in the study and established no differences between syndesmotic screw retention or removal in the Olerud-Molander (82.4 vs 86.7), AOFAS (96.3 vs 94), VASPain (1.0 vs 0.7) or dorsiflexion range (10.2° vs 13.0°). Although around three quarters of the retention group had a loose or broken screw at a year post-operatively, this did not appear to affect their functional outcome.[1] Given the thorough nature of this study and the range of outcome measures used in which there was no difference found, it seems to us here at *360* that removal of a syndesmosis screw should be reserved for symptomatic patients only.

Diagnostic value of Hawkins sign

x-ref Trauma

The diagnosis of avascular necrosis following trauma to, surgical approach to, or fracture of, the talus can be tricky. The classical Hawkins sign refers to a radiolucent line in the subtalar region representing remodelling of the talus. However, the relationship between Hawkins sign, avascular necrosis (AVN) and eventual function of the ankle is far from straightforward. There have been few attempts to relate MRI findings to this previously accepted predictor of outcome, in part at least due to the rarity of talar fractures. Clinicians in **Guangdong (China)** have been able to report their experience of 44 talar fractures over a five-year period and report their clinical results with particular attention to the prognostic value of MRI scanning in patients who had a negative Hawkins test.[2] Their clinical series (like many) reports a roughly standardised care pathway with patients followed up with regular plain radiographs and in those who had a negative Hawkins sign then an MRI scan. All patients also had AOFAS scores as a marker of clinical outcome. The Hawkins sign and MRI signs of AVN were inversely proportional in Type I (50% and 0%), Type II (30% and 10%) and Type III and IV (33% and 50%) fractures as would be expected from conventional wisdom. What would perhaps have been harder intuitively to pick out is that although the AOFAS scores did differ between Hawkins sign positive and negative groups, this difference disappeared when the AVN cases were excluded, suggesting that the Hawkins sign is highly specific, but not sensitive.

Chevron rules supreme?

The humble great toe is the subject of much angst for foot and ankle surgeons and their patients alike. Bunions are one of the few diagnoses in orthopaedics that can be both disabling and symptomatic, or completely cosmetic. Bunion surgery is not without its complications including infection, revision and poor satisfaction rates. Clinical practice varies between nations and units, and while Scarf and Chevron osteotomies are most popular in the UK, the Norwegians prefer Mitchell's and Chevron osteotomies. Researchers in **Trondheim (Norway)** set out to establish if there are any differences between the two osteotomies, and have undertaken a randomised controlled trial to establish the differences over a three-year period with the primary outcome measure of clinical results (measured by the American Orthopaedic Foot and Ankle Society [AOFAS] Clinical Rating System [CRS] scores). Both osteotomies were successful in reducing the hallux valgus angle from around 30° pre-operatively to around 15° degrees post-operatively, with no significant differences between the groups in terms of correction angles. This was reflected in the intermetatarsal angles as well (improving from around 14° to around 7° in both groups). Although the radiographic outcomes were similar, the clinical outcomes were not. Patients in the Chevron osteotomy group had much lower rates of transfer metatarsalgia (60% vs 10%) and this was accompanied by improved satisfaction scores in the Chevron group along with lower rates of associated hammer toes. We would certainly agree with the authors here – with improvements in outcome and lower complication rates, the Chevron osteotomy beats the Mitchell's hands down.[3]

Diabetes and ankle replacement

Diabetes and foot problems are closely linked, to the point that in many healthcare systems combined care of the foot sequelae of diabetes with multidisciplinary medicine, vascular surgery, orthopaedic surgery and podiatric ward rounds has become the standard of care. While there is a broad range of data to support various treatment options

for diabetic feet, the implications of diabetes for those contemplating ankle arthroplasty are not well described. Surgeons in **Seoul (South Korea)**, always keen to share their clinical data, have written up the results of 43 diabetic and 130 non-diabetic ankle replacements as a case-controlled series. They attempted to establish what the clinical and surgical outcomes of ankle replacement are and if they differ between the two cohorts.[4] Clinical outcomes were measured with the Ankle Osteoarthritis Scale (AOS) and the American Orthopaedic Foot and Ankle Society (AOFAS) scores and were both significantly better in the non-diabetic cohort. This was mirrored in surgical outcomes, with around double the failure rate at five years (21% vs 11.6%) in the diabetic cohort. Unsurprisingly, the problems were more acute in the uncontrolled diabetic group with high rates of delayed wound healing and higher rates of early osteolysis. In an implant with only relative indications and concerns about the longer-term outcomes and associated complications, this comparative case series does suggest to us here at *360*, for the time being at least, that extreme care should be taken offering these implants to diabetic patients.

Fixed-bearing ankle replacement

The outcomes of ankle replacements have been steadily improving, unlike the hip replacement, as eloquently argued in this month's feature article. The optimum prosthesis design, bearing surface and fixation method are yet to be defined. The earliest successful ankle arthroplasties relied on a mobile-bearing prosthesis to accommodate for imbalance in the soft-tissues and potential malalignment, however, the drawbacks of two bearing surfaces may in part explain the relatively high rates of osteolysis and loss of fixation. An alternative method is the fixed-bearing prosthesis. Using intramedullary jigging and a modular tibial component, the INBONE prosthesis aims to optimise alignment, fixation and generation of wear debris. Surgeons in **Durham (USA)** have some experience with the implant and report their consecutive three-year series of 194 primary ankle replacements at the short-term follow-up points of three years.[5] While these types of case series will never set the world alight, it is refreshing to find a large case series with thoroughly reported outcome scores including functional (AOFAS, VAS, Timed Up and Go), quality of life (SF-36) radiographic and surgical outcomes. In this closely monitored series, the patients reported improved clinical and quality of life scores at a mean follow-up of 3.7 years. As would be expected, all outcome measures improved over the pre-operative scores. Perhaps most importantly the surgical team were able to achieve correction for both coronal tibiotalar angle and sagittal plane correction which was maintained at final follow-up. The overall revision rate during the period of the study was 6%, with a 5% rate of subsidence likely to be unstable and lead to failure. The overall survival rate of the implant of 89% for the period of the study is in line with other 'benchmark' series and suggests that the INBONE style concept provides comparable results to other technologies (such as mobile bearing ankles) at just over three years.

Fusion for osteomyelitis of the ankle

x-ref Trauma

One of the myriad of things that can (and occasionally does) go wrong following fracture surgery to the ankle is infection. Although in most cases washout of acute fixation and subsequent removal of metalwork is often enough to solve the problem, acute infection can turn into established osteomyelitis which, while not common, is a complex problem to treat. In advanced disease or those with significant comorbidities, the choice can often be between amputation or ankle fusion. There is little evidence in this setting to aid the choice of fusion methods between internal or external fixation. Researchers in **Newark (USA)** have reported their experience of a retrospective chart review for patients, all of whom underwent fusion for established osteomyelitis following surgery for a traumatic injury.[6] In common with all retrospective comparative series, there is by definition a significant selection bias in the patient selection, with surgeons using either the technique they are most familiar with, or the one they feel intuitively suits the patient best. The series included 32 patient arthrodesis occurring in 30 patients, all with MRI or nuclear medicine proven osteomyelitis. There were 19 patients who underwent internal fixation fusions, while 13 were performed with external fixation. In terms of limb salvage rates for the internal and external fixation, there were no differences with salvage rates of around 90%. Very similar results were seen with respect to functional outcomes, with ambulatory rates of around 80% in each group and nonunion rates of around one third. This series presents a realistic view of what can be a very difficult problem to treat. However, with ambulatory rates in the range of 80% and low rates of further surgery in patients at over two years of mean follow-up, 'fusion for infection' remains an excellent choice in patients with osteomyelitis secondary to septic arthritis.

'Reformed' fallers

There are a range of potential interventions that have been tried in the past to cut the risks of falls and the overall cost to society. Despite the disability that many patients face with their feet and the intuitive association with potential fallers, there is little in the way of research to support the potential benefits of podiatric orthotic interventions as a modality to reduce fallers. A couple of recent Cochrane reviews have identified this as a potentially efficacious intervention to avoid falls and their associated healthcare costs. We were delighted to see a study protocol published in BMJ (Open) from the clinical trials unit in **York (UK)** which aims fairly and squarely to address this gap.[7] The study protocol is a multicentre randomised trial planning to recruit patients over the age of 65 years. All patients will be recruited from the podiatric outpatient setting and while both cohorts will receive their podiatric intervention and falls prevention information, the intervention arm will also receive a multifaceted podiatry intervention. The study team have produced a comprehensive well-designed study, with the aim of producing a definitive study on this potentially promising intervention. The study is powered to detect a 10% point reduction in the incidence of falls. The falls are self-reported with a diary being used to calculate the primary endpoint of falls/person/time over a 12-month period. This ambitious study aims to recruit 2600 patients and also assess secondary endpoints of health economic analysis, fracture rates, activities indices and quality of life scores. We look forwards to the results of this promising idea which may have significant benefits for a large number of patients.

REFERENCES

1. **Boyle MJ, Gao R, Frampton CM, Coleman B.** Removal of the syndesmotic screw after the surgical treatment of a fracture of the ankle in adult patients does not affect one-year outcomes: a randomised controlled trial. *Bone Joint J* 2014;96-B:1699-1705.
2. **Chen H, Liu W, Deng L, Song W.** The prognostic value of the Hawkins sign and diagnostic value of MRI after talar neck fractures. *Foot Ankle Int* 2014;35:1255-1261.
3. **Buciuto R.** Prospective Randomized Study of Chevron Osteotomy Versus Mitchell's Osteotomy in Hallux Valgus. *Foot Ankle Int* 2014;35:1268-1276.

4. Choi WJ, Lee JS, Lee M et al. The impact of diabetes on the short- to mid-term outcome of total ankle replacement. *Bone Joint J* 2014;96-B:1674-1680.

5. Adams SB Jr, Demetracopoulos CA, Queen RM, et al. Early to mid-term results of fixed-bearing total ankle arthroplasty with a modular intramedullary tibial component. *J Bone Joint Surg [Am]* 2014;96-A:1983-1989.

6. Moore J, Berberian WS, Lee M. An Analysis of 2 Fusion Methods for the Treatment of Osteomyelitis Following Fractures About the Ankle. *J Bone Joint Surg [Am]* 2014;96-A:ii. [Epub ahead of print]

7. Cockayne S, Adamson J, Corbacho Martin B, et al. The REFORM study protocol: a cohort randomised controlled trial of a multifaceted podiatry intervention for the prevention of falls in older people. *BMJ Open* 2014;4:e006977.