Arthrodesis takedown and ankle arthroplasty

Ankle arthroplasty has yet to be shown to provide more reliable and satisfactory results than fusion in a range of patients. However, we suspect that this is only a matter of time - as the prostheses and the long-term outcomes improve, arthroplasty will likely seem a more and more appealing option, certainly for lower-demand patients. It also potentially has an application in those patients who have ongoing painful ankles following a failed fusion, although use here is somewhat more controversial. Surgeons in **Wiesbaden (Germany)** have shared their experiences of total ankle arthroplasty following arthrodesis takedown, one of the most challenging procedures in foot and ankle surgery.[7] The authors report on the outcomes of 18 patients who underwent the procedure in their institution over a seven-year period. The mean age was 51 years and the mean follow-up was to 54 months. Reassuringly, this appears to represent a typical cohort of patients, with arthrodesis having been undertaken around six years prior to revision and all patients being revised to an unconstrained cementless total ankle arthroplasty. In common with many series of complex ankle arthroplasties, there was a not insignificant risk of medial malleolar fracture which sat at around 10% in this series (n = 2/18). As far as the radiographs go, the results were not exactly stunning and just 14 patients had entirely osseointegrated at final follow-up. However, none was loose enough to require revision, although one required revision for medial tilt. As far as the clinical results are concerned, the series was a success, with VAS scores decreasing from an average of 9 pre- to an average of 1.7 post-operatively. This reduction in pain was reflected in the change in SF-36 scores, with improvement in both physical (34 to 74) and mental outcome scores (49 to 76). This study essentially demonstrates revision of arthrodesis to be a success when undertaken for pain to a total ankle arthroplasty. These authors were also able to report reasonable outcomes when a contemporary design with uncemented bearings was used.

Post-operative films more useful than we think?

Post-operative radiographs are a staple of all healthcare systems for both personal audit of results and medicolegal purposes. These authors from **Daegu (South Korea)** ask, however, if there may be more information there than immediately meets the eye.[8] Their investigation aimed to establish whether hallux valgus recurrence could in any way be predicted on the appearance of the immediate post-operative radiographs. The authors reviewed the post-operative radiographs of 113 feet in 93 patients, all of whom had hallux valgus surgery consisting of a proximal Chevron osteotomy and distal soft-tissue correction, to establish whether any of the observed changes in the hallux valgus angle (HVA), the intermetatarsal angle (IMA), and sesamoid position had any bearing on eventual incidence of recurrence. Overall, 17% of patients had suffered recurrence during the period of the study, and a post-operative HVA of $> 8°$ and a poor sesamoid position were predictive of eventual recurrence. Perhaps entirely unsurprisingly, the authors also established that the greater the pre-operative deformity (HVA $\geqslant 40°$), the greater the chance of recurrence. It appears that by six months following initial surgery, there is no ongoing increase in HVA or in any of the other radiological parameters. Also, based on these data, one can say with relative confidence that, if a good correction is achieved, the patients will not likely require subsequent revision.

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Wrist & Hand

X-ref ***For other Roundups in this issue that cross-reference with Wrist & Hand see: Research Roundup 3.***

Steroid or release in trigger finger?

As surgeons, we must always consider non-operative measures prior to surgical interventions. Certainly, around the hand and wrist, steroid injections are universally commonly used to avoid, or at least delay, surgery for trigger finger. The question, however, is: How effective are these injections? A team from **Aarhus (Denmark)** report one of the few randomised trials in trigger finger, with the aim of comparing the two interventions.[1] Their study was designed to compare cure rates between the two interventions with follow-up at three and 12 months. At final follow-up, the results of 165 patients randomised either to ultrasound-guided injections (n = 84) or to surgery (n = 81) were available. The authors defined success as the digit having normal movement at final follow-up. A range of secondary outcomes were also reported, including complications and post-operative pain. They did not consider discomfort a failure. In terms of the primary outcome measure, by final follow-up (12 months) there was a dramatic difference between the two groups, with 99% of surgery patients and 49% of injection patients cured. However, in the surgical group there was one damaged digital nerve and three superficial infections, and in the injection group 11 steroid flares were seen, as well as two patients with fat necrosis. These authors have quantified the effect-size differences that have always been known, and this is a useful paper in terms of planning treatments for patients. Essentially, an injection gives a 50%

chance of success with no requirement for surgery, whereas surgery is almost universally successful but with a 5% risk of infection or nerve injury. A simple, but helpful, study that perhaps should have been performed some time ago.

Evidence-based management of adult trigger digits

■ **The British Society for Surgery of the Hand (UK)** commissioned, through its Research Committee, a systematic review of the evidence for treating trigger finger.[2] The overall evidence base is consistent with the results of the previous Danish study: that about 50% of patients eventually recur after a steroid injection. Nevertheless, the committee recommended, wisely in our view here at *360*, that a single steroid injection should be suggested before recommending surgery, as it offers effective short-term treatment. The committee also established that there is little evidence to support other non-operative modalities, such as splintage.

Needle treatment for Dupuytren's

■ Continuing with the theme of needles rather than surgery, collagenase clostridium histiolyticum (CCH) is now well established as an alternative option to surgery in treating some cords of Dupuytren's Disease (DD). Its proponents argue that it is a simple, easily administered intervention with few side effects that can be used to treat predominantly single-digit Dupuytren's cords and potentially provide improvement in function without the morbidity of surgical release. The only possible thorn in the CCH camp's side is that percutaneous needle fasciotomy (PNF) offers potentially exactly the same benefits at a lower cost, according to its supporters. So, which needle is best? In a randomised trial of 50 patients with proximal interphalangeal (PIP) contractures, again conducted in **Aarhus (Denmark)**, patients were randomised to one of the two interventions and followed up for two years.[3] The authors used a slightly unusual outcome of clinical improvement being a 50% reduction in contracture relative to baseline measurements. The authors also reported secondary outcomes including change in contracture, recurrence, adverse events, complications, and the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire score. The headline finding of the study was that, at final follow-up, neither treatment was terribly successful, with clinical improvement maintained in 7% of CCH patients and 29% of PNF patients. In this study, CCH led to more, mainly transient complications, with 93% of patients *versus* only 24% of the patients treated with PNF. No other differences were observed. This result, however, is somewhat difficult to explain – a CCH needle removes material while a PNF needle does not, so surely one would predict the recurrence should be higher with PNF. Perhaps we need to examine the supplementary effects of CCH on collagen metabolism.

Which type of cast for a Colles' fracture? X-ref

■ As any patient who has had one will attest, an above-elbow plaster is a horrible treatment. It dramatically reduces independent function in almost all daily activities, so we should avoid inflicting it on patients wherever we can. Although short forearm plasters are becoming the norm in the majority of units, some surgeons still think that an above-elbow plaster should be used for distal radial fracture, or specific subsets of distal radial fractures, to eliminate pronosupination in the forearm, and thereby reduce the potential for secondary displacement. These authors from **Seoul (South Korea)** randomised patients into two groups, which used the short and above-elbow plasters, respectively.[4] The investigators undertook radiological and clinical follow-up regularly up to six months post-injury, along with the disability rating from the cast recorded at plaster removal. Radiological parameters did not really differ between the two groups; although volar tilt was marginally better controlled in the above-elbow group, this did not translate into differences in significantly different functional measures (Disabilities of the Arm, Shoulder and Hand (DASH) and Visual Analogue Scale (VAS) scores) between the groups. Unsurprisingly, perhaps, the disability rating was significantly higher in the above-elbow group. The bottom line from this simple study is that there was no difference shown in outcome between an above-elbow or short plaster in stable fractures of the distal radius. Patients can be saved an awful lot of inconvenience if their surgeon follows the evidence, and the above-elbow plaster should be consigned to the dustbin.

Do psychological factors influence the outcome of carpal tunnel release?

■ Hand surgeons, as the thinking orthopaedic specialty, might be expected to have well developed emotional intelligence, and so recognise that psychological factors can influence the work that we do. Investigators from **Seongnam (South Korea)** reviewed the literature systematically to determine whether carpal tunnel release may be influenced by patient-related psychological factors.[5] The authors examined anxiety, depression, pain catastrophising, coping and mental health status, and screened 611 papers. However, just eight papers included data on mental health status and carpal tunnel decompression. Although the literature was scant, the authors were able to extract some interesting analysis. There were three studies reporting a significant association between satisfaction and perceived level of function; however, the data were far less complete or compelling when either pain or physical function was the outcome of interest. The authors concluded that the current literature does not support the association between psychological factors and outcomes in carpal tunnel release. This is reassuring, as we can expect this very effective and reliable

operation to work in any patient, regardless of their mental health status. What is less reassuring, of course, is that, although the objective assessment of function and subjective assessment of pain improves, patients with psychological issues are less likely to be satisfied with their result.

Which is better: open or endoscopic cubital tunnel release?

■ It seems, these days, that surgeons are literally prepared to place a scope anywhere. Not satisfied with simple arthroscopy, we are now entering into diverse fields ranging from sternoclavicular joint and subscapular arthroscopy to endoscopic nerve releases in the wrist and elbow. This surgical enthusiasm has thankfully been matched by a gamut of papers reporting outcomes, some of which are improved and some of which are not. The difficulty, of course, is making sense of these multiple disparate studies (often small case series) with a range of diverse outcome measures and their own inherent biases and complications. Endoscopic tunnel release may be rather more difficult to perform than the open procedure. Nevertheless, if it were shown that the endoscopic procedure provides better outcomes with fewer complications, then surely we should learn this technique. We were delighted to see this paper from a review team in **Pittsburgh, Pennsylvania (USA)**, who have done a good job of unpicking the conflicting literature surrounding

endoscopic cubital tunnel release.[6] The authors included all appropriate papers over a 54-year period reported on PubMed. For ease of analysis, they divided their outcomes into simple categories: good or excellent, and fair or poor, thus outcomes from all eight articles reporting a total of 494 patients (344 endoscopic and 150 open) could be included in the analysis. The endoscopic method had a better outcome than open (92% *vs* 83%), although the confidence intervals did overlap in terms of outcomes. As such, there is clearly a potential for a power issue here. However, the lower risk of complications (odds ratio 0.3) was based on a much greater number of patients (18 articles and 1108 patients), with four papers giving direct comparisons that favoured the endoscopic group. So, it appears that despite the increased technical difficulties of endoscopic cubital tunnel release, there may well be a clinical outcome benefit to the endoscopic approach, and there almost certainly is a complications benefit. What we really could do with now is a proper health economics analysis (which is likely to require more objective outcomes data) in order that potential costs and benefits could be calculated.

Does bivalving risk loss of position in a child's forearm fracture? X-ref

Bivalving of a plaster cast is the most common standard care pathway in acute plaster application. It is used to lessen discomfort or to reduce the consequences of swelling and focal pressure damage. One might be concerned that this would reduce the effectiveness of the cast in holding the underlying fracture, particularly when a plaster has been manipulated. A team from **Boston, Massachusetts (USA)** have undertaken the definitive study on the subject, and randomised 202 children with displaced radial and/or ulnar fractures either to circumferential (n = 101) or to bivalved (n = 101) long arm casts after closed reduction.[7] There were no significant differences in age between the two groups, nor in initial fracture displacement. The authors undertook clinical and radiological evaluations at one, two, four and six weeks. Outcomes were assessed in terms of radiological loss of reduction, with secondary reports of compartment syndrome, cast saw injury and neurovascular compromise. There were no differences in cast index (0.78 *vs* 0.80) for bivalved *versus* solid casts. There were also no significant differences between the groups in either loss of reduction or the need for surgical treatment, although one bivalved patient sustained a cast saw injury, and three bivalved patients had transient neurological abnormalities. No patients developed compartment syndrome, so it seems that bivalving does not risk loss of position, but nor does it reduce the risk of pressure damage from the plaster. This is probably one of those 'better safe than sorry' moments where, given that there is no real risk of loss of reduction, splitting the cast does not really have any obvious drawbacks.

The central slip fracture of the proximal interphalangeal joint X-ref

Dorsal fractures or dorsal fracture dislocations are the most common type of injuries encountered in the proximal interphalangeal (PIP) joint, and result in disruption or avulsion of the palmar plate. A simple dislocation can normally be reduced if the joint is generally stable and is mobilised without redislocation. However, the risk is long-term stiffness, especially flexion contracture. As the size of the volar rim (middle phalanx) fragment increases, so the joint may become increasingly unstable, and surgical techniques from dynamic external fixators through to fixation or even bone grafting are used to achieve a stable reduction in combination with early mobilisation. Uncertainty exists about the rewards (generally measured in the long term through range of movement) *versus* risks of increasing surgical dissection from the more complex described dislocations. The much rarer volar dislocation is inevitably accompanied by a central slip avulsion/fracture, which is a far more significant injury, and the role of surgery is even more unclear. It is therefore very useful to read a comprehensive series describing the outcomes of these injuries. Although just eight patients are reported in this series from **St Louis, Missouri (USA)**, six of them had arthritic change, an active range of motion of 54°, and four required further operative procedures including an amputation and two fusions.[8] Most patients appear to develop arthritis in the short-term (six months to one year) to mid-term (one to two years) timeframe, and some patients will require salvage procedures. The authors' results don't seem to differ significantly from those in their literature review; we would agree with the conclusions of this paper that patients should really be expecting a poor result from the offset, and that it isn't unreasonable to counsel them that further surgery is likely to be required.

Preservation of movement *versus* pain relief in wrist arthritis

There is always a trade-off in wrist arthritis – a successful wrist fusion will usually eliminate pain at the cost of movement, and in this paper from The Mayo Clinic in **Rochester, Minnesota (USA)**, the discussion of movement-preserving, arthritic-pain-relieving wrist surgical techniques continues.[9] In recent publications, proximal row carpectomy (PRC) has perhaps started to beat the four-corner fusion (4CF), with reports of lower complication rates and a more physiologic range of movement. In this retrospective review with a mean follow-up of 14 years, the results of 89 young patients who underwent one of the two procedures are reported (51 patients with 4CF, and 38 who underwent PRC). Both techniques were reported to be effective but, as usual, fewer complications were seen in the technically easier PRC, and better eventual movement. Marginally better grip strength was reported in those patients who underwent the 4CF. However, in this long-term follow-up, the revision rates were identical to those of a total wrist fusion. The obvious flaw in this retrospective study is the selection bias (i.e. if there is a concern of midcarpal as well as radioscaphoid osteoarthritis, we tend to lean towards 4CF rather than PRC). This paper is an impressive long-term follow-up study and the results appear to echo current concepts and practice.

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