ROUNDUP360

Wrist & Hand

Trapeziectomy superior to arthrodesis

There are a range of surgical options for treating degenerate change at the base of the thumb, with excision, interposition arthroplasty, suspension arthroplasty, hemiarthroplasty, total joint replacement and arthrodesis all having their advocates in current literature and clinical practice. There is, however, insufficient high quality evidence to support one treatment over another. Given the relative frequency of the diagnosis and suitability for a randomised controlled trial (RCT), we were not terribly surprised here at *360* to see a high quality study in this area from researchers in **Zwolle (The Netherlands)**.[1] The study team designed a tightly controlled RCT including only female patients over the age of 40 years, all of whom were randomised to either arthrodesis or trapeziectomy with ligament reconstruction and tendon interposition (LRTI). Outcomes were robustly assessed at one year follow-up with scoring for pain and function (Patient-Rated Wrist/Hand Evaluation (PRWHE) and DASH score). In addition to outcome scores, measurement of joint movement, strength and monitoring of complication rates were undertaken. The authors stopped the study for safety reasons after enrolment of just 43 patients. Interim analysis revealed a higher complication rate with significantly higher rates of moderate and severe complications in the arthrodesis group when compared with trapeziectomy with ligament reconstruction (71% vs 29%). Quite correctly, the authors stopped their study early prior to reaching the required sample size to reach power. As the follow-up progressed, the higher complication rate in the arthrodesis group led to an increase in requirement for revision surgery (two of 17 patients) and lower satisfaction rates (53% vs 85%). Interestingly, there were no differences in the clinical outcome scores between the two groups despite the safety and satisfaction concerns. Not surprisingly, the authors of this illuminating study "would not recommend" arthrodesis for women over the age of 40 years with osteoarthritis of the base of the thumb.

Tamoxifen beneficial in the short term x-ref

Dupuytren's disease is a curious condition. There is strong evidence that it is not only genetically determined, but like other enthesopathies, it is likely linked to matrix turnover and specifically the activity of matrix regulatory proteins such as matrix metalloproteinases. A greater understanding of the biology of these conditions should open the door for potential pharmaceutical interventions, if not to treat the initial contracture then at least to reduce recurrence rates. Reasoning that Tamoxifen is a non-steroidal anti-oestrogen that has a modulatory effect on transforming growth factor-beta (TGF-β) and has in pre-clinical studies been shown to have efficacy against fibroblast activity, researchers in **Pellenberg (Belgium)** designed a double-blind randomised controlled trial to establish the effect of tamoxifen on patient satisfaction and total passive extension after fasciectomy.[2] Inclusion criteria were set to include the most severely affected patients (Abe grade 4+) treated with a subtotal fasciectomy. Patients were randomised to receive either placebo or high dose tamoxifen for six weeks prior to and 12 weeks after surgery. Patients were followed-up for two years with regular clinical evaluation and satisfaction scores. The tamoxifen appeared to have a beneficial effect during and immediately after administration, with improved passive extension and satisfaction scores, although this benefit was lost during the subsequent two years. Tamoxifen appears to have a beneficial effect (although temporary) on the recurrence rates of Dupuytren's disease following surgery. Although a drug such as tamoxifen with a poor side effect profile is clearly not suitable as a long-term adjuvant therapy, this study does highlight a potential novel therapeutic opportunity for new drug therapies.

Semi-occlusive dressing "the bee's knees" even with exposed bone

Amputation of the fingertip is a common condition, with a myriad treatment options. When there is no exposed bone, treatment options typically utilise simple dressings, but with significant bone loss, surgery (often with amputation or advancement flaps) is usually offered. There is a middle ground, with soft-tissue loss and bony exposure but not loss. It is often difficult to know whether or not to offer these patients dressings or surgery. Clinicians in **Lucerne (Switzerland)** report a small but useful series of just these patients.[3] A total of 19 patients with bony exposure and soft-tissue loss were treated in their clinic with a semi-occlusive dressing and patients followed prospectively to examine the quantity and quality of soft-tissue regeneration with this simple conservative treatment approach. Outcomes were assessed with soft-tissue thickness around the bone (as compared with uninjured digits) and two point discrimination. By a minimum of six months' follow-up the soft-tissue regeneration was surprisingly good, both on the pulp (6 mm vs 7 mm) and distally (4.2 mm vs 4.5 mm). Skin healing was observed to be complete in all cases and the reformation of dermal ridges was particularly surprising. Two point discrimination also returned to around 4 mm (as compared with 3 mm on the contralateral side). This simple paper does leave us wondering, here at *360*, if surgical intervention is ever indicated for this type of fingertip injury given the outstanding results of conservative treatment. While it is clear that larger soft-tissue deficits will benefit from soft-tissue reconstruction, we cannot imagine surgical results superior to these for these middle ground lesions.

"Open" a relative concept in the hand and wrist x-ref

A surprising proportion of open fractures occur in the upper extremity and specifically in the wrist and hand. The significant morbidity (and occasional mortality) associated with severe open lower limb fractures has tended to focus research on that area and for the most part our understanding as a profession surrounding best practice management of open fracture is based on data derived from open tibial, femoral and foot fractures. However, as they say, the hand is not the foot. We were intrigued to read a very large series of nearly 300 open fractures of the upper extremity reported by colleagues in **Nashville (USA)**.[4] Their series included 200 patients with at least six months of recorded clinical follow-up, making this perhaps the most important series of its type. The study team examined a number of injury factors (Gustilo-Anderson grade, anatomic location and type) and treatment characteristics (antibiotic administration and timing and surgical details), along with patient demographic and comorbidity data. Outcomes were assessed as subsequent rates of deep infection and nonunion. The authors report an overall infection rate of just 5% (n = 10/200), although none of these infections were in type 1 fractures. Interestingly, despite the very low infection rate, treatment timings did not support currently perceived best practice with only 14% of patients receiving antibiotics in less than three hours and debridement being undertaken in less than six hours. In this series, the timing to antibiotic therapy and debridement was not associated with rate of infection and the strongest predictor of outcome was the Gustilo-Anderson grade. This excellent paper supports current practice in many large centres and perhaps it is time that guidelines were revisited for these patients.

Editorial decisions pushing up standards of reporting

Despite the improvements in study methodology, statistical analysis and large scale data mining have marked the evolution of orthopaedic research in the past few years. However, despite a revolution in open access journals, the increasing electronic presence of major journals and changes to funding models, one thing has not changed. The gold standard for publication remains the peer-review process headed by an Editor-in-Chief who has absolute discretion about publication policy. This has more of an effect on the

output of a journal than perhaps the reader might appreciate. It was refreshing to us all at *360* to read Grey Giddins' thoughts about small joint replacement in the hand.[5] Hand joint replacement has something of a chequered history, with many designs thrust onto the market with little prior clinical or pre-clinical data. The difference to a poor hip replacement is that there is a low volume of these inserted and failure is perhaps not as catastrophic to the patient. Many will be inserted into rheumatoid hands where there exists such gross destruction that even a silastic spacer such as a Swanson's type replacement appeals to the patient. In a very worthwhile read, an editorial from *The Journal of Hand Surgery (European)* discusses these problems with manufacturer-driven research and the Editor has taken an editorial decision that implant arthroplasty papers must have a minimum follow-up of two years, preferably five if they are to be accepted; the exception, obviously, being to report catastrophic early failure or significant early adverse event rates. Validated scoring systems should be included and early data on new techniques avoided for fear of promoting potentially damaging surgery. This robust stance strongly supports the role of the Editor and we are delighted to see hand surgery get its house in order as other journals (such as *The Bone & Joint Journal*) have done, and our congratulations go to the Editor.

Ulnar variance revisited

Ulnar variance is one of the few genuine 'variances' in the human skeleton. Not only does the proportion and morphology of the ulna change but its variance relative to the radius and also the morphology of the styloid and distal radial ulnar joint are all morphologically varied between individuals. In the face of this 'biodiversity', it is not surprising that ulnar variance is closely studied in an array of radio-carpal pathologies. Two different papers caught the eye of the boffins at *360* HQ this month, both concerning measurement of ulnar variance. In the first (Kawanishi et al), researchers from **Osaka (Japan)** investigated the use of 3D CT imaging as a potential gold standard in the measurement of ulnar variance.[6] They undertook CT scanning and performed measurements of ulnar variance and ulnolunate distance during forearm rotation. These were compared with plain film measures in 15 healthy wrists. The research team established that in moving from supination to pronation, a significant increase in variance was seen with plain radiography in all cases which was matched by an ulnolunate decrease. The counter was true with CT scanning where variance decreased. These changes, while interesting, are at best subtle, and perhaps the biggest challenge in ulnar sided wrist pain and other pathologies is not in the nuances of diagnosis of ulnar variance. In a similar paper, authors from **Irvine (USA)** aimed to characterise the changes in position of the radius in full range of prono-supination and elbow flexion extension.[7] These investigators, however, decided to undertake a cadaveric study. They designed a jig to allow for a full range of movement and used a 3D digitiser to establish the relative positions of the ulna and radius. The investigators examined 20 upper extremities in a full range of positions, giving an astounding maximal change in variance of 9 mm throughout the range of movement. Interestingly, nearly all of this is due to prono-supination movements with a minimal effect of different elbow angles on changes in variance, contributing only 0.8 mm.

Traditionalists are traditional x-ref

Never ones to shy away from controversy, the study team at **Ann Arbor (USA)**, instead of asking how a particular treatment affects a patient's outcome, decided instead to ask how the clinician seen by the patient affects the treatment offered.[8] It is rare to come across papers like this that examine what factors influence surgeons in treatment choice, rather than what they should do! Using fracture of the distal radius as a model, the study team linked data from 61314 Medicare beneficiaries who experienced a fracture, and also their treatment decisions, to the age of the 12823 surgeons who performed them while attempting to adjust for confounders such as patient age. A further stratified analysis was undertaken using membership of the American Society for Surgery of the Hand for stratification. The main findings of this data-linkage exercise were that surgeons aged under 40 years were more likely to perform open reduction and internal fixation than their older counterparts. The study team comment that "Given the lack of evidence supporting any single treatment option for DRF, understanding the factors that drive dissemination of operative techniques may provide insight into treatment disparities". There

are certainly a number of explanations and experience with particular techniques may certainly play a significant role (as likely do other factors, some of which may be industry led). This is a fascinating study and starts to throw some light at least on the drivers behind decision making approaches. It is important of course to remember that on average each surgeon in this study treated just 4.7 patients with a fracture of the distal radius and, as such, there is certainly a significant risk of bias here.

Diabetes not so bad with carpal tunnel

■ We were heartened to see a simple but extremely clinically relevant paper from researchers in **Lund (Sweden)** with a straightforward research question reaching a clear outcome.[9] Diabetic patients with carpal tunnel syndrome are often given rather a hard time during the consenting process, with perceived increased risks of surgical complications such as infection and the added complications from diabetic peripheral neuropathy painting a bleak picture. A carefully constructed prospective consecutive case series followed-up to five years with a comparative cohort series of patients with and without diabetes. A total of 35 patients were age- and sex-matched to controls without diabetes and outcomes assessed using sensory function (Semmes-Weinstein), motor function (abductor pollicis brevis muscle strength and grip strength), cold intolerance, and clinical outcomes (as assessed through the Boston Carpal Tunnel Questionnaire). Impressively, around 90% of participants attended for their five-year follow-up visits. There were no significant differences in any outcome measures between the two groups at any time point, although a significant improvement in function and symptom severity was seen between baseline and five-year follow-up, with a large effect size. Given the widespread preconceptions about the effects of diabetes on clinical outcomes in carpal tunnel release, it comes as a nice surprise that a five-year follow-up of diabetic patients matched against a non-diabetic control group shows both groups do equally well with a long lasting improvement. An improvement in cold intolerance might even suggest a potential for regeneration in the diabetic group.

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