

Mental Health a better determinant of outcome than tear size in rotator cuff tears

■ It is well known that the degree of pain can influence patients' mental health state – it doesn't require a rocket scientist to understand the link between chronic pain and depression. However there are more subtle nuances to the link between mental health and outcomes. Perhaps one of the most eye-opening studies we have read in recent times aims to explore the link between mental health, functional outcomes and rotator cuff tear morphology. The research team based at the **University of Utah (USA)** report their study linking the SF-36 mental health score and rotator cuff score to a range of outcome measures' (simple shoulder test (SST), American Shoulder and Elbow Surgeons (ASES) Score and a VAS score for shoulder pain). The study cohort consisted of 169 patients all with a diagnosis of full thickness rotator cuff scores. The patients' rotator cuff morphology was assessed using MRI scanning to establish the number of tendons involved, the tear surface area and retraction. The analysis was undertaken using multivariable regression models and adjustment was made for almost every conceivable variable. Of all the potential predictive variables screened, the mental health component of the SF-36 was by far the strongest predictor of the VAS shoulder pain score, VAS shoulder function score, SST score and the ASES score. The tear morphology and severity had a much poorer correlation with any of the outcome measures; however appeared to correlate best with shoulder functional scores. Once a multivariable model was introduced, the association between SF-36 mental health score was marked with all three outcome scores. This study is definitely food for thought. Whilst

the tear size and morphology had some bearing on the shoulder functional scores, the patients' mental health status dominated outcome measures on multivariable analysis. This clearly is likely to play an influential role in patient-reported pain and function.

How best to assess the GT fracture X-ref

■ The handed-down wisdom from the greats of orthopaedic surgery is that 5 mm of displacement around the shoulder is the threshold for a 'displaced' fracture or 'part'. Despite the time that has passed since Neer's original classification, nobody has yet bettered his original definitions and they are still in widespread use across the world today. Although the utility and simplicity of this approach is clear in the age of cross-sectional imaging and multiple radiographic views, it is less than clear if the 5 mm rule still applies for the greater tuberosity. A study team from **Boston (USA)** and **Amsterdam (The Netherlands)** report their study which aims to establish what the diagnostic strength of assessing fracture displacement of the greater tuberosity is on plain films and cross-sectional imaging.² The authors designed a survey-based study and although invitations were sent to 791 orthopaedic surgeons, they were only able to include the responses of 180 who replied in their article. The respondents were all given identical information about 22 fractures and randomised to one of radiograph alone, radiograph and cross sectional CT or radiograph, cross sectional CT and volume-rendered CT. Study participants were asked not only to assess the displacement but also to recommend operative or non-operative treatment, and the level of confidence with which they did so for each case. There were no differences in inter-observer error for displacement, or any discernible dis-

sentation as to which patients should be treated operatively. However there were significant differences in the reported confidence with which the treatment decisions were made. The group with volume-rendered images as well as radiographs reported much greater confidence levels in their treatment decisions. It certainly appears from this research that the addition of a CT of any variety did not change treatment decisions; however they offered the surgeon greater confidence in making that decision – not a reason one would have thought to expose the patient to ionising radiation!

Arthroscopic treatment of greater tuberosity fractures? X-ref

■ There is little that a shoulder surgeon will not consider 'putting a scope into'. Having reported papers concerning everything from subscapular decompressions to sternoclavicular joint scopes and coracoid transfers performed arthroscopically, it was only a matter of time before we expected to see arthroscopic fixation of humeral fractures described. This paper from **Beijing (China)** describes just that – although only in isolated greater tuberosity fractures with displacements of less than 2 cm. The authors describe their own cohort of 79 patients treated over a six-year period.³ Their patients were treated in a heterogenous manner – and the authors readily accept that the series itself is not really comparable as those patients with greater displacements or larger fragment sizes were treated in general with an open approach. The arthroscopic group received a double row-type repair where the open group underwent an ORIF. There were very few of the initial 53 open and 26 arthroscopic patients available for review, just 17 and 15 retrospectively. Clinical outcomes were assessed using a clinician administered ROM, VAS score, and American Shoulder and Elbow Surgeons (ASES) score, along

with regular radiographic review to a mean of 36 months follow-up. The arthroscopic group had longer surgical times (95 mins vs 61 mins) and there were however some subtle differences in the functional outcomes with a greater range of motion and better ASES score in the arthroscopic group, although these differences are not likely to have reached the MCID. We found this study rather disappointing, in so far as it promised to compare the two approaches, however with a very small number of patients, variable indications for surgery and some lack of clarity in the manuscript we were left thinking there were no real arguments to be made for the arthroscopic approach.

Nothing spoils surgical results like a non-operative group!

■ It is not uncommon for surgeons to undertake a resection of the corner of the scapula for patients complaining of snapping scapula. This chronic and slightly controversial diagnosis is rather subjective in its presentation and treatment options. Like many small print procedures there is little in the way of comparative studies and although there are plenty of case series describing various approaches, is far from clear if the benefit reported is related at all to the surgery, or simply the natural course of the condition. Shoulder surgeons in **Helsinki (Finland)** report a comparative series of 24 patients, 15 treated operatively with a snapping scapula.⁴ Those patients undergoing the surgical approach were treated with a resection of the superomedial portion of the scapula and a combined levator scapulae release. There are few such cases, and the authors reported patients treated at their centre over a 20-year period. Follow-up was to over 20 years following presentation in both groups. Whilst there are some clear limitations to such a small cohort with retrospective design and limited questionnaire based follow-up, we

can't help thinking that for such a rare condition, perhaps this is the best evidence there is likely to be. There were no differences in pain scores between the two groups, however crepitus was variably present across both of the groups and there did not seem to be an advantage from surgical release in terms of the presence or absence of crepitus. We would wholeheartedly agree with the authors here – although their paper could be used to support operative treatment of these patients, the inclusion of a similarly performing non-operative group certainly leads one to think that whatever treatments are offered, the patients all tend to recover given time.

Proximal humeral plates still have the edge [X-ref](#)

■ Whilst much of the world is somewhat at sixes and sevens in the light of the PROFFER trial, suggesting that for many proximal humeral fractures the outcomes of operative and non-operative treatment were equivocal, investigators in **Sao Paulo (Brazil)** have not been deterred by the suggestion that operative intervention may not have as much role as previously thought, and published their randomised study.⁵ The study team randomised patients with a two- or three-part proximal humeral fracture to either locking plate or locking nail fixation. Their study recruited 72 patients, all randomised to one intervention or another, and the outcomes were reported using the Constant score at 12 months, in addition to a secondary outcome of the DASH score. In terms of clinical outcomes there were few differences between the groups, with no significant differences in either clinical outcome score at final or any of the interval



follow-up visits. Radiographic outcomes were similarly unchanged between the two groups; however there were some significant differences in favour of the plate group with regards to reoperation and complication rates. For the moment it seems that although the functional outcomes are similar, the proximal humeral plates of the PHILOS type approach have a significant edge over the nails in terms of complications and reoperation rates.

Humeral fractures and longevity [X-ref](#)

■ The proximal humerus is one of the most common sites for fragility fractures, and like the neck of femur fracture, is common amongst the elderly and frail. There is little known about the impact of a proximal humeral fracture on quality and length of life, and our expectations here at 360 were high when we stumbled across this paper from **Herley (Denmark)** which reports the outcomes of arthroplasty for proximal humeral fractures.⁶ This registry-based study reports mortality as its primary outcome measure and is based on the results of 5853 primary shoulder arthroplasties performed over a six-year period. The authors essentially undertook a rather simple study comparing mortality between groups for diagnoses at the arbitrary end points of 30 days, 90 days and a year. Perhaps unsurprisingly, those patients with a fracture had a six-fold risk of mortality when compared with the general population and those shoulder arthroplasties being performed for arthritis during the first 30 days. While none of the information presented here is new – and we can't help wondering if more could have been made of a

large cohort of patients such as these – it does underline the difficult nature of these injuries, and that it isn't just hip fractures that carry a significant mortality burden.

The glenosphere and clinical outcomes

■ Despite the dramatic rise in popularity over the past few years in the use of the reverse shoulder and impressive clinical results seemingly able to salvage a functional shoulder from some of the most bleak of situations, the reverse shoulder suffers from many of the same limitations that the total shoulder does on the glenoid side with regards to bone stock and longevity; however the biomechanics are of course significantly different. It is the impact of these different biomechanics and specifically the glenosphere diameter that is the focus of an important clinical outcomes paper from **New York (USA)**.⁷ The authors report a prospective case-controlled series of 297 primary reverse shoulder arthroplasties. The procedures were undertaken using either a 38 mm or 42 mm glenosphere, and clinical outcomes were measured using the American Shoulder and Elbow Surgeons (ASES) scores and clinical assessment of range of motion. As perhaps could be expected from the small number of preceding biomechanical studies, those patients with the larger 42 mm glenosphere had significantly improved forward elevation and active external rotation. The authors do not however report a clear pattern in clinical outcomes with the male shoulders performing better with the 38 mm glenosphere and the female shoulders performing better with the 42 mm implant. There were no differences in the intra-operative complication rates. It is perhaps not surprising that there is little association between clinical score and implant size; however the clinical improvement in range of motion associated with a larger glenosphere

is potentially a very important observation. There are few implant design features in any arthroplasty that have been demonstrated to improve clinical outcomes. We remained potentially slightly concerned about the impact on the biomechanics of the glenoid fixation. A larger glenosphere will result in more torque forces dissipated across the glenoid fixation, and any impact in longevity will of course not be apparent in a two year follow-up series.

REFERENCES

1. Wylie JD, Suter T, Potter MQ, Granger EK, Tashjian RZ. Mental health has a stronger association with patient-reported shoulder pain and function than tear size in patients with full-thickness rotator cuff tears. *J Bone Joint Surg [Am]* 2016;98:251-6.
2. Janssen SJ, Hermanussen HH, Guitton TG, et al. greater tuberosity fractures: does fracture assessment and treatment recommendation vary based on imaging modality? *Clin Orthop Relat Res* 2016;474:1257-65.
3. Liao W, Zhang H, Li Z, Li J. Is arthroscopic technique superior to open reduction internal fixation in the treatment of isolated displaced greater tuberosity fractures? *Clin Orthop Relat Res* 2016;474:1269-79.
4. Vastamäki M, Vastamäki H. Open surgical treatment for snapping scapula provides durable pain relief, but so does nonsurgical treatment. *Clin Orthop Relat Res* 2016;474:799-805.
5. Gracitelli ME, Malavolta EA, Assunção JH, et al. Locking intramedullary nails compared with locking plates for two- and three-part proximal humeral surgical neck fractures: a randomized controlled trial. *J Shoulder Elbow Surg* 2016;25:695-703.
6. Amundsen A, Rasmussen JV, Olsen BS, Brorson S. Mortality after shoulder arthroplasty: 30-day, 90-day, and 1-year mortality after shoulder replacement-5853 primary operations reported to the Danish Shoulder Arthroplasty Registry. *J Shoulder Elbow Surg* 2016;25:756-62.
7. Mollon B, Mahure SA, Roche CP, Zuckerman JD. Impact of glenosphere size on clinical outcomes after reverse total shoulder arthroplasty: an analysis of 297 shoulders. *J Shoulder Elbow Surg* 2016;25:763-71.