ROUNDUP360

Shoulder & Elbow

Platelet-rich fibrin matrix and the torn rotator cuff

There are few things more hotly debated in the field of biological orthopaedics than the use of platelet-rich fibrin matrix (PRFM). Research seems to wax and wane in its enthusiasm for the preparation, so it is always good to see prospective, randomised clinical studies in this field. One has recently appeared from **New York (USA)**, looking at the role of PRFM in the management of the torn rotator cuff. As the authors write, PRFM allows delivery of autologous cytokines to healing tissue, and limited evidence suggests a positive effect of platelet-rich plasma on tendon biology. As part of their Level II trial they studied 79 patients undergoing a standard arthroscopic rotator cuff repair and randomised them intra-operatively to either receive PRFM at the tendon-bone interface (n = 40) or a standard repair but with no PRFM (n = 39). Standardised repair techniques were used for all patients and the post-operative rehabilitation protocol was the same in both groups. The primary outcome measure was tendon healing as shown by ultrasound (intact *versus* defect at the repair site) at six and 12 weeks. Power Doppler ultrasound was also used to evaluate vascularity in the peribursal, peritendinous, musculotendinous and insertion site areas of the tendon and bone anchor location. Secondary outcomes included standardised shoulder outcome scales (American Shoulder and Elbow Surgeons (ASES) and L'Insalata) and strength measurements using a handheld dynamometer. Patients and the assessor were blinded to the treatment group. All patients were evaluated at a minimum one-year follow-up. Overall, there were no differences in tendon-to-bone healing between the PRFM and control groups. Complete tendon-to-bone healing (intact repair) was found in 24 of 36 (67%) in the PRFM group and 25 of 31 (81%) in the control group. There were no significant differences in healing seen by ultrasound between six and 12 weeks. There were gradual increases in ASES and L'Insalata scores over time in both groups, but there were no differences in scores between the groups. The authors also found no difference in vascularity in the peribursal, peritendinous, and musculotendinous areas of the tendon between the groups, and no differences in strength between the groups. Logistic regression analysis demonstrated that PRFM was a significant predictor for a tendon defect at 12 weeks.[1] How sad, we think at *360*, when there seems to be so much support for platelet-rich plasma out there in the orthopaedic world, albeit coloured by frequent debate. This study clearly shows that PRFM applied to the tendon-bone interface at the time of rotator cuff repair had no demonstrable effect on tendon healing, tendon vascularity, manual muscle strength, or clinical rating scales. In fact, the regression analysis suggests that PRFM may actually have a negative effect on healing. That is bad news. Further study is most definitely needed.

PRP and the torn rotator cuff – a further failure

And we do have a further study, this time from **Chicago (USA)** and **Toronto (Canada)**. Here the authors undertook a systematic review in order to identify the available evidence to compare the efficacy of arthroscopic rotator cuff repair in patients with full-thickness rotator cuff tears who were concomitantly treated with platelet-rich plasma (PRP). This was a Level III systematic review of Level I, II, and III studies. The authors searched the Cochrane Central Register of Controlled Trials, Medline, Embase, and PubMed for eligible studies. Two reviewers selected studies for inclusion, assessed methodology, and extracted data. They found five studies (two randomised, three non-randomised) that met the inclusion criteria, with a total of 261 patients. Methodology was uniformly sound, as assessed by the Detsky scale and Newcastle-Ottawa scale. However, quantitative synthesis of all five studies showed that there was no difference in the overall rate of rotator cuff re-tear between patients treated with PRP and those treated without. There were also no differences in the pooled Constant score, Simple Shoulder Test score, ASES score, University of California, Los Angeles shoulder score, or the Single Assessment Numeric Evaluation score.[2] There can only be one conclusion at this stage in *360*'s view. PRP does not appear to have an effect on overall re-tear rates or shoulder-specific outcomes after arthroscopic rotator cuff repair. Again, further well-designed and randomised trials are needed.

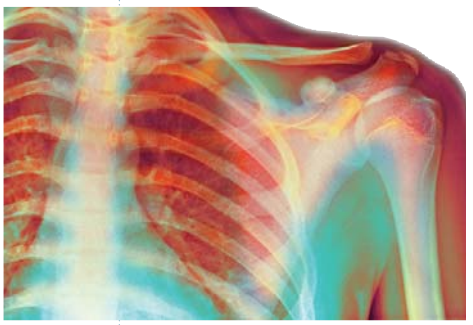
Ultrasound, trainees, and ducks out of water

How good are we when placed firmly outside our comfort zones? For example, what might happen if an orthopaedic surgeon was asked to aim an ultrasonographic probe at a shoulder? Well, we can now tell you. Teams from **Blackpool** and **Ormskirk (UK)** have looked at how orthopaedic trainees might undertake an ultrasound examination of the shoulder, as this is increasingly being conducted by orthopaedic surgeons in the diagnosis and treatment of shoulder conditions. However, shoulder ultrasound is not a mandatory feature of training programmes in the UK. The aim of this study was thus to assess the effectiveness of a shoulder ultrasound teaching workshop administered to postgraduate orthopaedic surgical trainees. The trainees participated in a workshop on shoulder ultrasound examination with a particular emphasis on demonstrating the acromioclavicular joint (ACJ) and the long head of the biceps (LHB) in the bicipital groove. The ability of the trainees to demonstrate the ACJ and the LHB using ultrasound was then assessed. There were 33 orthopaedic trainees who participated in the study. This study showed that, after training, there were 23 (70%) trainees who were able to demonstrate the ACJ and 14 (42%) who could demonstrate the LHB without assistance. The skills acquired by the trainees were

independent of their year in training and previous shoulder experience. Now this is where *360* disagrees. The authors state their study shows that a basic shoulder ultrasound-teaching workshop was effective in equipping postgraduate orthopaedic trainees with basic ultrasound techniques. It could potentially become part of a structured orthopaedic training programme, they say.[3] Perhaps, but why were only 42% of the trainees able to image the ACJ after a course of training? That means that 58% could not see the thing after they had been taught. Sound like ducks out of water, to *360*. Anyway, at least there is free access to this article.

The torn rotator cuff and conservative treatment

■ Talk about doing ourselves out of business. How about treating the torn rotator cuff conservatively? Well, a group from **Ugo (Japan)** has done this in order to clarify the long-term results of masterly inactivity. Their study focused on 103 shoulders, diagnosed with rotator cuff tears by MRI or arthrography, from 1996 to 1999. There were 65 shoulders followed up by telephone survey, of which 43 were evaluated and 22 excluded. Of these exclusions, 11 were because the patient had died, ten because of severe dementia, and one had been exposed to trauma. The mean patient age for these 43 shoulders at the time of diagnosis was 62 years, and the mean follow-up period was 13 years. The pain score (maximum 30 points) and the activities-of-daily-living score (maximum 10 points) of the Japanese Orthopaedic Association shoulder scoring system were determined. The mean pain score was 25.4 points, and the proportion of patients with no pain or only slight pain was 88%. The mean score for activities of daily living was 9.4 points, and the proportion of patients with no disturbance to their daily lives was 72%. The patients with lower scores tended to be younger than the other patients. So, it seems that the shoulder surgeons have to pack up their bags and think of something else. This study has clearly shown the long-term result of rotator cuff tears treated conservatively. At 13 years after diagnosis, about 90% of patients had no pain or only slight pain, and about 70% had no disturbance in activities of daily living.[4] However, the older the patient is, the better they do. There is, it appears, one tiny advantage to ageing.



Bankart repair and subsequent degenerative change

■ Long-term results are so very important for a number of joints, particularly when surgery is undertaken for instability. So a paper from **Helsinki (Finland)** on the long-term results of arthroscopic Bankart repair was something we read with interest at *360*. Between January 1994 and December 1998, an arthroscopic Bankart repair was performed on 187 patients at the authors' institution. The surgeons were subsequently able to assess clinical and radiological glenohumeral osteoarthritis in 72 (74 shoulders) of the 101 patients (71%) who met their inclusion criteria after a 13-year follow-up. A further nine patients were interviewed by telephone. Radiological osteoarthritis was measured with the Samilson-Prieto classification, and clinical osteoarthritis with an osteoarthritis-specific quality-of-life questionnaire (Western Ontario Osteoarthritis of the Shoulder test). In addition, functional impairment was assessed with the Constant score and subjective satisfaction with a questionnaire. Radiological osteoarthritis was diagnosed in 50 of 74 shoulders (68%), with 40 (80%) of them classified as mild. The mean score on the Western Ontario Osteoarthritis of the Shoulder questionnaire was 280 points (85% of the best possible score), which the authors considered relatively good. The mean Constant score was 78 points, and 75% of the patients were extremely satisfied or satisfied with the final results of their operative treatment. The radiological evaluation and self-assessment of these patients suggests that the incidence of glenohumeral osteoarthritis after arthroscopic Bankart repair is quite common.[5] Fortunately, the symptoms are generally mild. So, in *360*'s view a Bankart repair does not prevent the development of osteoarthritis, much as one might wish otherwise. However, at least the degenerative change is not a major handicap as and when it appears.

Proprioception after shoulder replacement

■ What happens to proprioception after shoulder replacement? One might imagine it would improve over time. Consequently, a study from **Heidelberg (Germany)** into this very question interested *360*. The authors enrolled 21 patients who underwent total shoulder replacement (n = 10) or hemiarthroplasty (n = 11) for osteoarthritis of the shoulder. All patients were examined one day before their operation, and at six months and three years after surgery in a movement analysis study with an active angle-reproduction test. Overall proprioception measured by the active angle-reproduction test deteriorated significantly three years after surgery and was significantly worse than in controls. In the hemiarthroplasty subgroup, three years after surgery, there was a significant deterioration of proprioception, more so than for total shoulder replacement. The comparison of post-operative impairment of proprioception between the two subgroups showed significantly worse proprioception for the hemiarthroplasty subgroup at 30° of external rotation *versus* 1.6° in the shoulder replacement group. In conclusion, proprioception that was measured by an active angle-reproduction test remained unchanged or deteriorated three years after shoulder replacement; particularly so after hemiarthroplasty.[6] Best opt for a total shoulder replacement, we think at *360*, if you wish to preserve your proprioception.

Surgery for a terrible triad, with reasonable short-term results

■ There are several terrible triads in orthopaedic surgery. That affecting the elbow is a dislocation of the joint with associated fractures of the radial head and coronoid process of the ulna. Not a happy situation, in *360*'s view. There are various ways of treating the problem, two of which involve either radial head reconstruction or radial head replacement. Surgeons from **Auckland (New Zealand)** have reported on 23 patients (24 elbows) who presented with this injury over a seven-year period. There were 11 women and 12 men with a mean age of 43.5 years. The mean duration of follow-up was 41 months. The authors compared the radial head repair group (n = 13) and the radial head replacement group (n = 11), and found no significant difference between the variables of age, length of follow-up, ASES score, satisfaction score, range of movement, and the associated arcs of movement. Only one significant difference was noted; the radial head replacement group scored higher values on their scores. It seems clear that elbow fracture-dislocations are difficult injuries to treat. However, this study shows that with operative repair or replacement of the radial head to restore stability through radiocapitellar contact, coronoid, and lateral ligament repair, a good range of movement and stability can be achieved at short-term follow-up.[7]

The WORC Index – a score for the rotator cuff

■ Outcome measures are becoming increasingly important for most of us as we seek to justify our practices, coax reimbursement from unwilling insurers or keep our legal brethren from coming too close. So a paper from **Leiden (The Netherlands)** on the Western Ontario Rotator Cuff Index (WORC) is well timed. The WORC is an increasingly applied condition-specific outcome measure for rotator cuff conditions. However, as the authors point out, in most WORC validation studies only a limited number of psychometric properties are studied in indistinct patient groups. They thus set about assessing the psychometric properties of the WORC in three patient groups with distinct rotator cuff conditions. This was a Level II diagnostic cohort study. The WORC (range 0 to 100; 21 items, 5 domains) was administered twice (T_1, T_2) in 92 patients (35 rotator cuff tears, 35 calcific tendonitis, 22 impingement). Additionally, the Constant and DASH scores were recorded. Patients with calcific tendonitis were reassessed six weeks after they had been treated with needling and lavage or a subacromial injection with corticosteroids (T_3). The authors assessed floor and ceiling effects, internal consistency, test-retest reliability, precision, construct validity, minimally detectable change, and responsiveness in the diagnostic subgroups and the total group. The mean age was 55.0 years and 49 of 92 (53%) patients were female. The mean baseline WORC was 46.8, mean Constant score 63.9, and mean DASH score 40.9. Significant differences were found for the Constant and DASH scores between patients with severe symptoms from a rotator cuff tear and the other patients, but not for the WORC. There were also no floor and ceiling effects. Internal consistency was high and the intraclass correlation coefficient and standard error of measurement indicated high reproducibility. At T_3, the total WORC improved significantly. The effect size and mean standardised response indicated good responsiveness. It thus appears that when applied to a variety of rotator cuff patients, the WORC had high internal consistency, moderate to good construct validity, high test-retest reliability, and good responsiveness.[8] *360* agrees with the authors when they conclude that the findings support the use of the WORC as a condition-specific self-reported outcome measure in rotator cuff patients. However, its validity in patients with severe symptoms does need further investigation.

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