



The Bone & Joint Journal

Journal club: 11 March 2014

Attendees: Prof Len Funk, Mr Mike Walton, Mr Krishna Swamy, Olivia Flannery, Simon Roche, Saurabh Mehta, Anne Marie Byrne, Neil Jarvis, Usman Butt, Kiran Nairoti.

Wrightington Hospital, Upper Limb Unit.

Reviewer: Mr Manickam Rathinam, Upper Limb Fellow

Kukkonen J, Joukainen A, Lehtinen J, Mattila KT, Tuominen EKJ, Kauko T and Äärimala V.

Treatment of non-traumatic rotator cuff tears - a randomised controlled trial with one-year clinical results. *Bone Joint J* 2014;96-B:75-81.

Summary

Background

Non traumatic rotator cuff tears have a 20 to 30% prevalence in 60 to 80 yr olds. The healing capacity cuff tendons in these tears is impaired, predisposing them to re-tears. Existing literature states that conservative treatment and acromioplasty yield acceptable results.

Purpose

To compare three different modalities of treating non traumatic rotator cuff tears and to investigate if repair of these tears yields superior results.

Methods

Design – three armed, prospective randomised superiority study conducted in three hospitals in Turku, Finland, between October 2007 and December 2012. The study included non-traumatic, symptomatic supraspinatus tendon tear in patients aged 55 years or over, comprising less than 75% of the tendon insertion as documented on MRI scans. All patients should have a full range of motion of the shoulder. Patients with any history of trauma, massive cuff tear, involvement of more than one tendon, stiffness of glenohumeral joint or arthritic changes were excluded.

Group 1 – treated with Physiotherapy

Physiotherapists well trained in shoulder rehabilitation were used. At 0 to 6 weeks, a standardised exercise protocol to improve glenohumeral motion and active scapular retraction. Between 6 to 12 weeks, static and dynamic exercises for scapular and glenohumeral muscles were gradually increased. At 3 to 6 months resistance and strength training were commenced. Written instructions the patient and referral for ten sessions of outpatient physiotherapy

Group 2 – treated with SAD + Physiotherapy

In this group, Subacromial debridement and an arthroscopic acromioplasty were carried out by smoothing the inferior surface of the acromion from a postero-anterior direction. Acromio clavicular joint (ACJ) resection performed if painful and arthritic changes were seen on MRI scan along with Biceps tenotomy if it was found to be frayed. Rest in sling for three weeks with early mobilisation at home. After 3 weeks, rehabilitation commenced as per group 1

Group 3 - treated with SAD + Cuff repair + Physiotherapy

Subacromial debridement and acromioplasty were performed. ACJ resection and biceps tenotomy were performed, if indicated. Cuff repaired anatomically using standard titanium bone anchors with non-absorbable sutures (Corkscrew FT II; Arthrex or Twinfix; Smith-Nephew). Post operatively, 0 to 3 weeks immobilisation in a sling followed by rehabilitation with the same regime as group 1.

Outcome Measures:

Constant score was used as the primary outcome measure. An independent study nurse was employed to collect the scores at less than 1 month pre-operatively followed by three months, six months and at one year after intervention. The total health care cost was retrieved from structured questionnaire forms. All patient data was saved in an electronic patient registry

Results:

A total of 167 shoulders (55 in group 1, 57 in group 2, and 55 in group 3) were available for analysis at one year (dropout rate 7.2%). The mean sagittal size of isolated supraspinatus tendon tears in group 1 was 9.6 mm (SD 5.2), in group 2 was 9.3 mm (SD 5.3) and group 3 was 8.5 mm (SD 4.0) ($p = 0.48$). In the surgical groups, ACJ resection was carried out in 7 shoulders (12%) and 8 shoulders (15%) in groups 2 and 3 respectively. Similarly, Biceps tenotomy was done in 29 shoulders (51%) and 23 shoulders (42%) respectively in groups 2 and 3.

The final outcome did not differ significantly based on one-year Constant score – 75.4 (SD 12.3) in group 1, 78.3 (SD 10.7) in group 2 and 75.6 (SD 15.8) in group 3, ($p = 0.69$). However, the pain ($p = 0.0321$) and activities of daily life (< 0.0001) components of constant score were significantly better in the surgical groups. The mean cost of treatment was €2417 (SD 1443) in group 1, €4765 (SD 896) in group 2 and €5709 in group 3 ($p < 0.0001$). The mean direct cost for the patient €427, €486 and €456, respectively ($p = 0.96$). The mean indirect societal cost €2130, €4486 and €5461, respectively ($p < 0.0001$).

Discussion

For non-traumatic supraspinatus tears, the three different interventions had a similar outcome at one year. The current study appears to offer evidence of the true benefit of physiotherapy when treating non-traumatic rotator cuff tears (Constant score improving within 3 months of physiotherapy in group 1. The limitations are the short follow up, Non blinded study design and no post op MRI to assess re-tear rate.

Conclusion

Results in accordance with previous studies demonstrating successful conservative treatment of rotator cuff tears. Authors support a conservative regime as the primary treatment for non-traumatic rotator cuff tears in older patients. Longer term studies are recommended to define the optimal nature and true effect of physiotherapy, as well as the long-term outcome of all the interventions investigated.

Critique:

Strengths

- Prospective, randomised design
- Good number of participants
- Robust statistical analyses
- Financial implications analysed

Weaknesses

- The 'pain' and 'ADL' components of the constant scores, which correspond to the main symptoms in this cohort of patients, were significantly better in the two surgical sub-groups in the study and this finding has not been discussed adequately.
- Clarity in measurement of tear size is required
- Longer term follow up is needed to know the effect of unrepaired cuff tears
- Not excluded compounding factors such as ACJ arthritis

Overall conclusion

This study is clinically relevant to daily practise of shoulder surgery . With improvement in arthroscopic techniques and anecdotal literature quoting superior results following repair of non-traumatic cuff tears, there is a possibility of unnecessary or superfluous surgical intervention in these patients. The study supports the current practise in majority of hospitals in the National Health Service. However, long term outcome of these treatment methods should be available to draw firm conclusions.