

Kukkonen J, Joukainen A, et al. Treatment of non-traumatic rotator cuff tears. A randomised controlled trial with one-year clinical results. Bone Joint J 2014;96-B:75-81

Design: randomized clinical trial

Study question: in the setting of non-traumatic tears of the supraspinatus, are there differences in one-year outcomes between patients treated with physiotherapy (PT) alone, PT plus acromioplasty, and PT plus acromioplasty plus rotator cuff repair?

Population/sample size/setting:

- 180 shoulders (173 patients) were evaluated for treatment of rotator cuff tears at three hospitals in Finland
- 167 shoulders (85 female, 82 male, mean age 65) were included in the study
- Eligibility criteria were age over 55, atraumatic symptomatic supraspinatus tears documented by MRI and comprising less than 75% of the tendon insertion, and informed written consent
- Exclusion criteria were age under 55, history of trauma relating to onset of symptoms, any massive tendon tear of the whole supraspinatus tendon and/or combined tear of two or more tendons, glenohumeral stiffness or osteoarthritis with osteophytes in radiographs, systemic steroid medication, significant medical comorbidity, history of alcohol or drug abuse, previous surgery on the shoulder, and patient refusal

Main outcome measures:

- All patients had a similar PT regimen, but at different times in relation to the beginning of the study
 - o A physiotherapist trained in shoulder rehabilitation provided written instruction and guidance for home exercises with a standardized protocol
 - o Exercises started with improving glenohumeral motion and active scapular retraction for the first six weeks, then static and dynamic exercises were gradually increased from 6 weeks to 12 weeks, after which the patient increased resistance and strength training for up to 6 months
 - o The patient was also referred for 10 PT sessions at an outpatient facility where progress was monitored
- Randomization of the 167 shoulders was to PT alone (Group 1, n=55), PT plus acromioplasty (Group 2, n=57), and PT plus acromioplasty plus rotator cuff repair (Group 3, n=55)
 - o Group 2 had arthroscopic subacromial debridement by smoothing the inferior surface of the acromion, plus resection of 6 mm of the A-C joint if it had been painful before surgery, plus biceps tenotomy if the long head was unstable or frayed, followed by instruction from PT after the operation on glenohumeral

- motion and scapular retraction; three weeks later, the PT program of Group 1 was implemented
 - Group 3 had the acromioplasty and other surgical procedures of Group 2, plus rotator cuff repair with titanium bone anchors, followed by three weeks of sling immobilization, followed by the PT program of Groups 1 and 2
- Main outcome measure was the Constant score evaluated by an independent nurse 1 month before any intervention, then again at 3, 6, and 12 months after baseline
- The mean size of the supraspinatus tears on MRI was 9.6 mm in Group 1, 9.3 mm in Group 2, and 8.5 mm in Group 3
- Groups 2 and 3 had similar rates of A-C resection (n=7 for Group 2 and n=8 for Group 3) and biceps tenotomy (n=29 for Group 2 and n=23 for Group 3)
- Constant scores were similar at one year in the three groups: 74.1 for Group 1, 77.2 for Group 2, and 77.9 for Group 3 (p=0.34)
 - The pain and activity of daily living subscores for the two surgical groups were better than those for Group 1, but the numerical scores are not reported
 - The subscores in Fig 3a for pain appear to be about 11.8 for Group 1 and 13.2 for Groups 2 and 3
 - The ADL subscores in Fig 3b appear to be about 14.0 for Group 1 and 16.4 for Groups 2 and 3
- Patient satisfaction at one year was 87% in Group 1, 96% in Group 2, and 95% in Group 3
- In Group 1, 4 patients crossed over to receive rotator cuff repair, and 1 patient in Group 2 crossed over to rotator cuff repair; the crossovers did not affect the final statistical outcome
- The average cost for Group 1 was €2417, for Group 2 €4765, and for Group 3 €5709

Authors' conclusions:

- Surgical repair of the rotator cuff does not improve the Constant score compared to acromioplasty and nonoperative treatment with exercise supervised by a physiotherapist
- The patients and staff were not blinded to treatment allocation and the followup period was relatively short
- Other studies (Moosmayer 2010) reported that surgical intervention was more effective than conservative treatment for rotator cuff tears, but the majority of those patients (57%) had traumatic tears of the cuff
- The results support a conservative approach to nontraumatic rotator cuff tears in older patients, but longer followup evaluations are needed

Comments:

- The differences in the Constant subscores for pain and ADL warranted some discussion by the authors, but this was not done
- The differences may be smaller than they appear to be in Fig 3a and 3b
 - o Pain is assessed on a 15 point scale and ADL on a 20 point scale; the y axis for both scores starts at 10 points, and the difference of 1.5 to 2 points may not be of great clinical significance
 - o The overall Constant scores are very close and the small differences of about 3 to 3.8 points on the 100 point scale are substantially equivalent
- While not proving that surgery offers no benefit above and beyond PT for nontraumatic tears, the results appear to support an initial approach involving nonoperative interventions with exercise supervised by a physiotherapist trained in shoulder rehabilitation

Assessment: Adequate for some evidence that in patients over 55 with nontraumatic small tears of the supraspinatus tendon, an intervention of home exercise supervised by a shoulder-trained physiotherapist may be as beneficial at one year as the same physiotherapy program initiated after acromioplasty or acromioplasty with repair of the rotator cuff

Reference (reviewed elsewhere):

Moosmayer S, Lund G, et al. Comparison between surgery and physiotherapy in the treatment of small and medium-sized tears of the rotator cuff. BJBS BR 2010;92B:83-91