

Treatment of non-traumatic rotator cuff tears: A randomised controlled trial with one-year clinical results

Kukkonen J, Joukainen A, Lehtinen J, Mattila KT, Tuominen EKJ, Kauko T, Äärimaa V (2014) Treatment of non-traumatic rotator cuff tears: A randomised controlled trial with one-year clinical results. *The Bone and Joint Journal* 96:75-81. (Abstract prepared by Thomas Hoffman)

ABSTRACT

Aim

The purpose of this randomised controlled trial was to compare the effectiveness of three interventions for the treatment of non-traumatic supraspinatus tendon tears in patients aged 55 years or older.

Methods

One hundred and eighty shoulders from 173 participants were randomly allocated to one of three groups; physiotherapy (group 1), acromioplasty and physiotherapy (group 2), and rotator cuff repair, acromioplasty and physiotherapy (group 3). Patients with an isolated supraspinatus tear viewed on magnetic resonance imaging, full range of motion of the shoulder and ≥ 55 years of age were included. The primary outcome measure was the Constant score (Constant and Murley 1987), which can be grossly divided into four subsections (pain, activities of daily living, range of movement, and strength); data regarding direct and indirect costs of care were also collected. Participants were assessed at baseline, and at three, six and 12 months post-intervention; data were analysed on an intention to treat basis using analysis of variance.

Results

One hundred and sixty-seven shoulders were analysed at one year giving a dropout rate of 7.2%. No between-group differences in the Constant score were evident at the one-year follow-up with mean scores of 74.1 ± 14.2 in group 1, 77.2 ± 13.0 in group 2, and 77.9 ± 12.1 in group 3. The mean change in the Constant score was 17, 17.5, and 19.8, in groups 1, 2 and 3, respectively ($p = 0.34$). The mean cost of treatment was \$3,817 for group 1, \$7,633 for group 2, and \$9,145 for group 3.

Conclusion

When compared to surgical repair, similar improvements in pain and function were evident in patients who underwent acromioplasty and/or received physiotherapy. A conservative treatment approach for patients with non-traumatic supraspinatus tears is supported.

Commentary

Rotator cuff tears are a common cause of pain and dysfunction in the shoulder and may be traumatic or non-traumatic in origin. The prevalence of these tears is known to increase with age, with more than 25% of 60 year olds and 50% of 80 year olds presenting with a tear in a Japanese population (Yamamoto et al 2010). Whilst surgery is generally considered to be the treatment of choice in traumatic tears, the optimal management of non-traumatic tears is less well known. Aside from surgical repair of the rotator cuff, other alternatives exist

such as acromioplasty and physiotherapy, both of which have shown promising results (Kuhn et al 2013).

Kukkonen et al (2014) have provided some clarity in the treatment of non-traumatic rotator cuff tears with a well-powered randomised controlled trial investigating the effectiveness of three different regimens, all of which included physiotherapy. All patients received the same physiotherapy programme, which consisted of a six-month home exercise plan and 10 sessions with a physiotherapist. This programme focused initially on improving glenohumeral joint motion and scapular retraction before progressing to strengthening exercises for the musculature around the shoulder girdle. At one-year post-intervention, operative treatment was found to be no better than physiotherapy. Additionally, and as to be expected, physiotherapy alone was determined to be the most cost-effective of the three interventions. These results are in agreement with other recent research, which found physiotherapy to be highly effective in the treatment of full-thickness rotator cuff tears (Kuhn et al 2013).

This paper had several strengths and was of high methodological quality. The size and follow-up rate are impressive with 167 of the original 180 shoulders assessed at one year (follow-up rate of 92.8%). The relatively large treatment groups allowed the study to be adequately powered thereby reducing the risk of type two error. Despite the numerous positives, there were some limitations to this study. The relatively strict inclusion criteria may detract from the generalisability of the findings as patients often present with a limitation in range of motion and have multi-tendon involvement. Additionally, the follow-up time of one year means assessment of the long-term effectiveness of the three treatments was not possible. It would have been interesting to see whether these results were maintained over a longer period (e.g. 3-5 years).

The results of this study support the growing body of evidence, which advocates physiotherapy as the treatment of choice in patients with non-traumatic rotator cuff tears. There were no differences in outcomes at one-year post-intervention, suggesting no added benefits from performing acromioplasty or rotator cuff repair. Patients who only received physiotherapy demonstrated far quicker improvements in function than those who had rotator cuff repairs. Additionally, physiotherapy was found to be more cost effective, estimated at half the cost of surgery. Clinically, this provides further evidence that physiotherapy should be considered the treatment of choice for patients over 55 years of age with non-traumatic rotator cuff tears.

Tom Hoffman BPhy
Post-graduate student, Diploma in Sports Physiotherapy
University of Otago

REFERENCES

- Constant CR, Murley AH (1987): A clinical method of functional assessment of the shoulder. *Clinical Orthopaedics and Related Research* 214: 160-164.
- Kuhn JE, Dunn WR, Sanders R, An Q, Baumgarten KM, Bishop JY, et al; MOON Shoulder Group (2013): Effectiveness of physical therapy in treating atraumatic full-thickness rotator cuff tears: A multicenter prospective cohort study. *Journal of Shoulder and Elbow Surgery* 22:1371-1379.
- Yamamoto A, Takagishi K, Osawa T, Yanagawa T, Nakajima D, Shitara H, Kobayashi T (2010): Prevalence and risk factors of a rotator cuff tear in the general population. *Journal of Shoulder and Elbow Surgery* 19:116-20.