ABSTRACT

**Goal:** Effectiveness of open subacromial decompression and acromioplasty (on anterior approach) for subacromial impingement syndrome.

**Materials and methods:** The study group is composed of 62 patients, 32 women and 30 men, with a mean age of 56.2 years (extremes 39-71) who, between 2002 and 2006, underwent open acromioplasty using transdeltoidian anterior approach, accompanied by previous complete section of coracoacromial ligament and partial subacromial bursectomy for subacromial impingement syndrome; all patients had no lesions of the rotator cuff. A local anesthetic/steroid subacromial injection was administered to all patients with a clinical diagnosis of subacromial impingement syndrome. Among these, 51 patients had a positive injection test but the symptoms came back in less than one year and other 11 patients had a negative injection test but the diagnosis was sustained on MRI (they all together represent the “surgical” group). The results were evaluated according to Constant score at the onset of the disease, after the local anesthetic/steroid subacromial injection and postoperative at 6 weeks, 3 months and 6 months after surgery.

**Results:** The preoperative mean Constant score was 43 points (extremes 19-66), after subacromial injection 74 (extremes 49-89) and postoperative at 6 weeks 63 (extremes 31-81), at 3 months 76 (extremes 44-93), at 6 months 81 (extremes 48-98).

**Conclusions:** The local anesthetic/steroid subacromial injection is an effective method of diagnosis and treatment of inflammatory arthropathy. Section of coracoacromial ligament, subacromial bursectomy and acromioplasty represent a good option in patients who don’t respond to conservative treatment.
INTRODUCTION

In patients with inflammatory arthropathy, shoulder symptoms often arise from the glenohumeral joint, related to either synovitis or chondral damage. However, in some cases, pain and loss of function may be due primarily to subacromial inflammation, secondary impingement and rotator cuff damage (1,2,4) (Figure 1).

The goal of this paper is to prove the effectiveness of open subacromial decompression and acromioplasty (on anterior approach) for subacromial impingement syndrome.

MATERIALS AND METHODS

The study population consisted of 62 patients with inflammatory arthropathy who underwent open shoulder surgery for clinically evident subacromial disease, between 2002 and 2006. The open shoulder surgery consisted on open acromioplasty using transdeltoidian anterior approach, accompanied by previous complete section of coracoacromial ligament and partial subacromial bursectomy.

The patients were all under the care of a rheumatologist who referred them to an orthopedic surgeon. All had shoulder symptoms, especially pain, which had failed to respond to standard conservative management. The shoulder pain was rated by all patients as one of the most significant problems of their inflammatory arthropathy. Average age was 56.2 yr (range 39-71 yr). Thirty-two patients were female and thirty male. All had a good range of passive glenohumeral movement.

A local anesthetic/steroid subacromial injection was administered to all patients with a clinical diagnosis of subacromial impingement syndrome (13,14) (Figure 2).

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negative injection test. In the event of a negative result to the injection test, the diagnosis was confirmed by computed tomographic arthrography or magnetic resonance imaging (10,12) (Figure 3).

All patients underwent standard open subacromial decompression. The outcome was assessed using the Constant score, performed preoperatively and, at 3 weeks, 3 months and 6 months after surgery. The eventual functional outcome was correlated with the results of the injection test and the operative findings.

**RESULTS**

The preoperative mean Constant score was 43 points (range 19-66), after subacromial injection with a positive response 74 (range 49-89) and postoperative at 6 weeks 63 (range 31-81), at 3 months 76 (range 44-93), at 6 months 81 (range 48-98).

The mean improvement in the group who underwent surgery at 6 months postoperative was 38 points (43 rising to 81) compared with 31 points (43 rising to 74) in the group with positive response to subacromial injection. The groups were otherwise similar for age, gender, and clinical findings.

One patient, who had a good clinical result when assessed 3 months after operation, was lost to later follow-up when she left the country.

There were two cases with a complication, which was related to the operative procedure. These patients developed postoperative haematoma, which required a second look with evacuation and drainage.

At final follow-up, nine of the remaining eleven patients (82%) reported that their shoulder was still satisfactory when compared to its preoperative condition (Figure 4).

These patients demonstrated less pain and improved function, including an overall improvement in active forward elevation. One patient with a good score was pleased enough with the result to request the same procedure on the other side.

**DISCUSSION**

This preliminary study has demonstrated good functional improvement and pain relief from symptoms in the shoulder related to inflammatory disease following subacromial surgery. Improvement was greatest in patients with little or no chondral damage of the glenohumeral joint (6). All the patients in this study group had unresolved inflammatory arthritis, affecting more than one joint, which required preoperative systemic medication. The shoulder symptoms were felt by all patients to be one of their most troublesome problems, despite ongoing medical management by a
The interpretation of the longer-term results of subacromial shoulder surgery in patients with inflammatory arthritis needs to be modified when such patients are compared with patients with rotator cuff tendinitis related to non-inflammatory intrinsic cuff degeneration and secondary impingement. In the inflammatory group, any recurrence of the underlying disease process following operative treatment can produce inflammation in the subacromial bursa and glenohumeral joint (8). This can further destroy the rotator cuff and chondral surfaces, and consequently diminish the long-term result. Therefore, any improvement with a mechanical approach, such as in this series, might only be expected to help for a limited period, which naturally depends on the degree of control of the primary disease process. All the patients in this study required continued systemic medication postoperatively. In the light of this, a long-term satisfaction rate of 82% is pleasing. This is despite there being eight cases with a rotator cuff tear. It is possible that the subacromial decompression, by mechanically removing the impingement of the rotator cuff and increasing the subacromial space, may allow recurrence of some inflammation but, initially at least, without the redevelopment of symptoms.

The score indices available and used in this study were designed for assessing patients with non-inflammatory disease. In a patient with an inflammatory arthropathy there is no allowance by the assessment scales for generalized disease, and in particular hand, elbow and neck pathology, which may influence detrimentally both pain and functional assessment. In particular, the power assessment of the Constant score was difficult in this group. The scores, therefore, may not reflect the full benefit of the procedure.

The natural history of the disease process and the prevalence of rotator cuff damage influence the type of shoulder surgery considered for patients with inflammatory arthropathy. Open acromioplasty carries the risk of wound breakdown, deltidoid detachment, and recurrence of the disease process, which could ultimately destroy any rotator cuff repair. Therefore, arthroscopic procedures have less complications and are of choice if the necessary expertise exists (5). The presence in most cases of poor rotator cuff function suggests there is a benefit, when carrying out subacromial decompression, in preserving the coracoacromial ligament. This should control to some extent any tendency for superior subluxation of the humeral head related to increasing rotator cuff damage (11).

The patients with the most severe chondral damage in the glenohumeral joint had the worst clinical result. One of these patients had loss of articular cartilage to bare bone in the glenohumeral joint, which was not evident on plain X-rays (3). It is now our practice to obtain a computed tomography scan preoperatively, as it demonstrates the state of the glenohumeral joint more accurately. If significant glenohumeral damage is seen, we now consider that the chances of improvement with surgery are low.

This series has demonstrated encouraging results in a small group of patients for whom there are limited options. Further prospective studies are necessary to assess the specific indications for, and results of, surgery in the management of inflammatory arthritis in the shoulder.

**CONCLUSION**

The steroid/local anesthetic injection test is a useful tool both diagnostically and prognostically in patients with subacromial impingement syndrome. In patients with a confirmed diagnosis but a negative test there is still a significant improvement in the postoperative Constant score, but this is of a lesser degree than in those with a positive result to local anesthetic injection.

From this study it appears that if a patient with inflammatory arthropathy has shoulder pain, limited function, clinical evidence of rotator cuff tendinitis with positive impingement signs and no major chondral damage, a reasonable result can be expected for several years with a subacromial decompression (section of coracoacromial ligament, subacromial bursectomy and acromioplasty).
REFERENCES