Acta Orthop Scand 56, 147–148, 1985

Acromioplasty for impingement syndrome

In 51 patients (27–67 years) with subacromial impingement syndrome, an acromioplasty according to Neer was performed. In 11 patients, acromioclavicular arthrosis was found, and in these patients the lateral end of the clavicle was resected as well. The patients have been followed for an average of 21 (6–42) months. The result was excellent or good in 33 patients. In seven patients there was no improvement.

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We have studied the results after decompressive acromioplasty of the subacromial space (Neer 1972) in patients with subacromial impingement syndrome (Laumann 1980).

Patients and methods

All operations were performed at the departments of orthopaedics in Falun and Gävle. In total, 51 patients were operated on, 34 men and 17 women with a mean age of 48 (27–67) years. The duration of the symptoms was on average 3.5 (1–10) years.

All patients had a history of at least 1 year of symptoms refractory to conservative treatment. All had a typical painful arc on examination, as described by Neer (1983) as "impingement sign" and in all patients a small amount of local anaesthetic infiltrated into the subacromial space gave temporary pain relief, the "impingement test" (Neer 1983).

Radiographic examination with standard projections was normal in 35 patients, arthrosis of the acromio-clavicular joint was found in 11 patients, and calcific deposits in the rotator cuff were found in five patients. Arthrography was performed in only seven patients, and revealed rupture of the rotator cuff in three patients.

Operation

The subacromial space was exposed through a curved incision from the coracoid process to the lateral margin of the acromion. Beginning at the acromioclavicular joint, the deltoid was detached from the anterior edge of the acromion and, if necessary, from the acromio-clavicular joint capsule. If further exposure was necessary, the deltoid was split in the direction of its fibres about 5 cm distally. Acromioplasty according to Neer (1972) was performed. In this procedure the anterior edge of the acromion and its undersurface were removed with an osteotome, giving a wedge-shaped piece of bone including the entire attachment of the coraco-acromial ligament. The ligament was then cut at the coracoid process. In the 11 patients with osteoarthritis of the acromioclavicular joint, 1 cm of the lateral clavicle was excised as well. A full thickness rupture of the cuff was only repaired if this could be done without excessive advancement of the tissue.

Peroperatively a full thickness rupture of the rotator-cuff was found in 11 patients and it was repaired in eight. Partial rupture of the cuff as found in eight patients, tendinitis or bursitis in 14, and rupture of the biceps tendon in one patient.

Pendulum exercises and assisted motion were started on the second or third day. Active flexion was avoided for about 2 weeks. Patients with a cuff repair were treated in the same way.

The patients were followed up for an average period of 20 (6–42) months. Functional results were evaluated according to a four-grade scale; *excellent* – totally free from symptoms; *good* – improved but occasionally mild pain with normal activity level, no limitation on shoulder movement; *fair* – improved but some pain on shoulder movement, occasionally night pain; and *poor* – no improvement. The patients' own evaluation was also recorded (satisfied, doubtful or not satisfied).

Results

The overall result was satisfactory with excellent or good results in 33 out of 51 patients (Table 1). Among the eight patients with a repaired cuff rupture, two patients were excel-

Table 1. Function after acromioplasty for impingement syndrome

	Acromioplasty	Acromioplasty + resection of the acromioclavicular joint	Total
Excellent	18	4	22
Good	10	1	11
Fair	6	5	11
Poor	6	1	7
Total	40	11	51

lent, three good, two fair, and one patient poor. Of the three patients with total cuff rupture without repair, one was excellent, one good and one poor. Subjectively, 39 patients were satisfied, six doubtful and six not satisfied with the operation. No infections or other wound complications were recorded.

Discussion

The painful shoulder presents major problems of differential diagnosis. We have adopted the concept of Neer (1972, 1983) and accepted impingement of the subacromial structures as one cause of pain and disability. Besides a long history of typical pain, the impingement sign and test (Neer 1983) should be positive to qualify for surgery; pain elicited when raising the arm in forward flexion (impingement sign) is not specific for the impingement situation alone, but if local anesthetics in the subacromial space eliminate the pain, there is reason to believe that shoulder conditions other than impingement can be excluded.

The results after complete or lateral acromionectomy have often been disappointing, probably because of dysfunction of the deltoid muscle or residual impingement (Neer & Marberry 1981). In anatomical studies, Neer (1972) and Laumann & Hertel (1978) found that resection of the coraco-acromial ligament and the anterior third of the acromion was sufficient to decompress the rotator cuff.

According to Neer (1983), there are three progressive stages of impingement, with the most advanced stage associated with cuff rupture. To distinguish these patients preoperatively, a more extensive examination (e.g. arthrography and arthroscopy) is necessary. This was not done routinely in our study. In 11 patients a full thickness cuff rupture was found peroperatively. The number of patients in our series is too small to allow conclusions as to whether cuff repair or reconstruction is advisable; two patients with cuff rupture, one repaired and one not repaired, had poor results.

Acromioplasty as well as resection of the acromio-clavicular joint was performed in 11 patients. The results in this group were inferior to the group where only acromioplasty was performed (Table 1). These patients as well as those with a ruptured cuff represent a more advanced stage of degeneration and the prognosis may generally be worse even with surgery. There is also reason to believe that the more extensive deltoid detachment in the former group gives a persisting dysfunction of the deltoid muscle.

In our opinion the overall results were satisfactory, especially considering the long history. The poor results in seven patients cannot be fully explained. We believe that in some patients the symptoms may have originated not from the shoulder but from a cervical spine disorder, and that these symptoms primarily were not fully recognized. Cervical spine examination, including axial pressure of the spine, often changes the character of symptoms and is therefore essential in the preoperative evaluation of shoulder pain.

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