

Short-Term Results of Patients Undergoing Arthroscopic Subacromial Decompression and Acromioplasty

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ABSTRACT

Aim: The aim of this study is to evaluate the arthroscopic surgery results of cases with isolated subacromial impingement syndrome (SIS) that do not respond to conservative treatment.

Material and Methods: 44 patients who had arthroscopic subacromial decompression and acromioplasty due to SIS between 2015 and 2018, were retrospectively analyzed. Patients with isolated subacromial impingement syndrome who did not respond to conservative treatment including drugs, physiotherapy, exercises and subacromial steroid injections were included. For the patients, preoperative and postoperative The American Shoulder and Elbow Surgeons Shoulder (ASES) Scores were measured.

Results: Forty-four patients with a mean follow-up of 26.4 months (ranging from 24 to 35 months; SD: 7.3) and a mean age of 51.4 (ranging from 39 to 55; SD: 6.96) were reached. Thirty (68%) of the patients were female and fourteen (32%) were male. There were no significant differences between groups according to the age, sex, and follow-up time ($p>0.50$). There were type 3 acromion in total of 7 patients and type 2 acromion in 18 patients. The overall mean preoperative ASES score was 38.8 (ranging from 36.6 to 41.8). And, the mean postoperative ASES score was 84.9 (ranging from 76.2 to 88.3).

Conclusion: The short-term clinical results of subacromial decompression and acromioplasty in patients who do not respond to conservative treatment has successful results that support literature knowledge.

Keywords: Shoulder pain; shoulder impingement syndrome; arthroscopy; operative therapy.

Artroskopik Subakromiyal Dekompresyon ve Akromiyoplasti Uygulanan Hastaların Kısa Dönem Sonuçları

ÖZ

Amaç: Bu çalışmanın amacı, konservatif tedaviye yanıt vermeyen izole subakromiyal sıkışma sendromu (SSS) olan vakaların artroskopik cerrahi sonuçlarını değerlendirmektir.

Gereç ve Yöntemler: 2016-2018 yılları arasında SSS'e bağlı artroskopik subakromiyal dekompresyon ve akromiyoplasti olan ve düzenli takiplere gelen 44 hasta retrospektif olarak incelendi. NSIAD'ler, fizyoterapi, egzersizler ve subakromiyal steroid enjeksiyonları dahil konservatif tedaviye yanıt vermeyen izole subakromiyal sıkışma sendromlu hastalar dahil edildi. Hastaların ameliyat öncesi ve sonrası Amerikan Omuz ve Dirsek Cerrahları Omuz (ASES) Skorları ölçüldü.

Bulgular: Ortalama takip süresi 2,4 ay (24-35 ay arasında değişen; SS: 7,3) ve yaş ortalaması 51,4 (39-55; SS: 6,96) olan kırk dört hastaya ulaşıldı. Hastaların 30'u (% 68) kadın, 14'ü (% 32) erkekti. Gruplar arasında yaşa, cinsiyete ve takip süresine göre anlamlı fark yoktu ($p> 0,50$). Toplam 7 hastada tip 3 akromiyon, 18 hastada tip 2 akromiyon vardı. Genel ortalama hazırlayıcı ASES skoru 38,8 idi (36,6 ile 41,8 arasında). Ortalama postoperatif ASES skoru 84,9 idi (76,2 ile 88,3 arasında).

Sonuç: Konservatif tedaviye yanıt vermeyen hastalarda subakromiyal dekompresyon ve akromiyoplastinin kısa dönem klinik sonuçları literatür bilgisini destekleyen başarılı sonuçlara sahiptir.

Anahtar Kelimeler: Omuz ağrısı; omuz sıkışma sendromu; artroskopi; cerrahi tedavi.

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INTRODUCTION

Pain typically occurs with compression of the subacromial and subdeltoid bursa, rotator cuff tendons, or the long head of the biceps between the coracoacromial arch and the humeral head when raising the arm (1). Neer first defined the SIS and divided it into three phases. Neer described chronic bursitis in the initial stage, partial or full-thickness supraspinatus tendon ruptures in the advanced stage, tears of the remaining part of the rotator cuff and the addition of long biceps tendon problems in the last stage (2). The relationship between SIS and rotator cuff injury is not clear. Some authors say that it causes the development of rotator cuff damage due to external pressure (3,4). It has been reported that osteophytes in the anterior and medial of the acromion are the main pathology (2). These changes revealed that the rotator cuff and the humeral head were primarily in the anterior rather than laterally due to compression between the anterior of the acromion and the coracoacromial ligament. In addition, it has been revealed that the anatomical shape of the acromion is also important on SIS development. In particular, the Type 3 acromion has also been shown to be closely related to rotator cuff tears (5).

It is possible to diagnose and manage the treatment of the SIS with the history, physical examination and appropriate imaging in addition to these. Typically the pain is seen at 70°-120° abduction. Neer and Hawkins tests are the most commonly used tests for the diagnosis of impingement (6). Although these tests are very sensitive, their specificity are not very high. There are also strong meta-analysis results suggesting that the lift-off test is more sensitive in diagnosis of SIS (7). Radiographs must be taken to evaluate the coracoacromial arch. However, Magnetic Resonance Imaging (MRI) provides a detailed assessment of possible impingement areas. The narrowest point in sagittal and coronal images is less than 7 mm supports the subacromial impingement syndrome (8).

Conservative treatment of SIS includes rest, lifestyle changes, injections, strengthening the muscles, ultrasound (US) and physical therapy modalities (9). Surgical treatment is generally preferred in cases where conservative treatment fails (10). With the advances in arthroscopy, arthroscopic subacromial decompression has become the gold standard treatment method in SIS treatment. Many studies have found that arthroscopic treatment gives better results than open surgery (11).

The aim of this study is to evaluate the arthroscopic surgery results of cases with isolated subacromial impingement syndrome that do not respond to conservative treatment.

MATERIAL AND METHODS

After the approval of Bolu Abant İzzet Baysal University University Clinical Researches Ethics Committee (2021/19), 44 patients who had arthroscopic subacromial decompression and acromioplasty due to SIS between 2015 and 2018, were retrospectively analyzed. The written consent was obtained from the patients and they were asked to fill in the informed consent form.

Patients with isolated subacromial impingement syndrome who did not respond to conservative treatment

including anti-inflammatory drugs, physiotherapy, exercises and injections were included. Patients with supraspinatus tear, subscapularis tear, infraspinatus tear, adhesive capsulitis, previous fractures or a history of surgery were excluded from the study. Video records consisting of the described surgery were used to evaluate the presence of a cuff tear, degree of CAL degeneration, and associated pathologic change for each patient.

Patients with complaints of pain and limitation of movement were evaluated with physical examination and magnetic resonance imaging techniques and their first treatment was initiated. First of all, it was decided to perform arthroscopic evaluation for the patients who received conservative treatment and whose treatment failed. Patients' preoperative and postoperative shoulder-joint motions were measured both actively and passively. For the patients, preoperative and postoperative ASES (The American Shoulder and Elbow Surgeons) Shoulder Scores were measured.

Surgical technique

All patients were operated arthroscopically under the interscalene block in the lateral decubitus position. First, standard glenohumeral joint examination was performed, the presence of intraarticular pathology such as biceps long head pathologies, slap lesion, rotator cuff, labrum was evaluated. After glenohumeral arthroscopy, subacromial arthroscopy was performed to examine the bursal-side rotator cuff disease, CAL, acromion, and bursa. CAL degeneration, which is an arthroscopic indicator of subacromial impingement syndrome, was evaluated and staged according to Royal Berkshire Hospital classification. Subacromial decompression and acromioplasty were performed in patients with stage 2-3 CAL degeneration (Figure 1 and 2).

Statistical Analysis

Statistical analyses of demographic data and the presence of subacromial impingement syndrome were made using SPSS/PC (version 18.0 for Windows; SPSS Inc, Chicago, IL, USA). The normality of distribution of the continuous variables was tested with the Kolmogorov-Smirnov test. Wilcoxon's signed-rank test was used for comparisons of the preoperative and post-operative ASES. p value of <0.05 was considered statistically significant.

RESULTS

Forty-four patients with a mean follow-up of 26.4 months (ranging from 24 to 35 months; SD: 7.3) and a mean age of 51.4 (ranging from 39 to 55; SD: 6.96) were reached. Thirty (68%) of the patients were female and fourteen (32%) were male. There were no significant differences between groups according to the age, sex, and follow-up time (p>0.50). There was type 3 acromion in total of 7 patients and type 2 acromion in 18 patients.

The overall mean preoperative ASES score was 38.8 (ranging from 36.6 to 41.8). And, the mean postoperative ASES score was 84.9 (ranging from 76.2 to 88.3 (Table 1). There was no statistically significant difference in preoperative and postoperative clinical scores according to gender and acromion type (Table 2).

Table 1. Demographic characteristics and shoulder scores of all patients

Male/Female (ratio)	Age (mean,year)	Folow-up (mean,month)	ASES score preoperative, mean	ASES score postoperative, mean	Type 1 acromion	Type 2 acromion	Type 3 acromion
32/68%	51.4	26.4	38.8	84.9	19	18	7

ASES score: The American Shoulder and Elbow Surgeons Shoulder Scores

Table 2. The effect of gender and acromion type on clinic scores.

		ASES preoperative	ASES postoperative	P
Gender	Male	40.50	85.40	0.706
	Female	37.09	84.29	
Acromion type	Type 1	38.0	87.65	0.447
	Type 2	35.50	84.00	
	Type 3	34.01	83.49	

ASES score: The American Shoulder and Elbow Surgeons Shoulder Scores

DISCUSSION

Neer explained this syndrome as mechanical compression of the rotator cuff tendons under the antero-inferior part of the acromion and in the anterior flexion and internal rotation position of the shoulder (12). Many mechanisms have been suggested in the formation of this pathology. These can be examined in two main groups as internal (caused by pathologies within the tendon) and external (caused by pathologies in the tissues surrounding the tendon) causes (13). External causes include the presence of Type 3 acromion morphology, presence of os acromiale, acromioclavicular joint pathologies and instabilities (12,14). It was emphasized that the compression was in the lateral of the acromion in the early days. However, over time, anterior acromioplasty has come to prominent. Pain at night and triggering pain during overhead activities are the most common findings. However, these findings can easily be confused with other shoulder pathologies. The differential diagnosis is made with Neer compression test, which is evaluated by the regression of the symptoms after local anesthetic injection (12,15).

Treatment for impingement syndrome is divided into conservative and surgical. Conservative treatment options that are more frequently preferred are rest, lifestyle changes, injections, strengthening the muscles around the scapula, US and physical therapy modalities. The first treatment of patients should be physiotherapy. While there is no significant difference between the results of patients who undergo physiotherapy and surgery, it is reported that patients should undergo absolute physiotherapy before surgical treatment and surgery should be performed with the correct indication (16,17). In a prospective study, corticosteroid injection and physical therapy were administered to 100 patients with SIS, and 79% of the patients did not require surgery during the two-year follow-up. The ASES scores of these patients increased from 56 to 95 (18). In another study,

exercise was found to have a positive effect on pain and function, but no effect on range of motion and strength (19).

Surgical treatment is recommended for patients who do not respond to conservative treatment for 3--6 months. Surgical treatment is more successful especially in patients who do not have limitation of movement in the shoulder, who have a positive Neer and Hawkins test, who have reduced pain after lidocaine injection, who have Type 3 acromion and who have changes in the rotator cuff in MRI (20). Long-term successful results of open anterior acromioplasty have been reported (20). With the advances in arthroscopy, arthroscopic subacromial decompression has become the gold standard treatment method in SIS treatment. Many studies have found that arthroscopic treatment gives better results than open surgery (20,21,22). Arthroscopic therapy includes subacromial decompression, bursectomy, coracoacromial ligament release, acromioplasty, os acromiale and assessment of the acromioclavicular joint. Subacromial bursa is located on the anterior portion of acromion. Subacromial decompression and bursectomy are standard surgical procedures for good imaging. Coracoacromial ligament degeneration classification is used for arthroscopic staging of subacromial impingement syndrome. The Royal Berkshire Hospital classification is frequently used (4,23). If there is advanced stage degeneration, acromioplasty treatment is added to surgical procedure (4).

The development of the technique makes arthroscopic acromioplasty prominent as a treatment option. In prospective studies, good clinical results have been reported in patients who underwent bursectomy only and those who underwent bursectomy and acromioplasty (24,25). Arthroscopic subacromial decompression provides short-term pain reduction and functional recovery (26). The results of this study also support the information in the literature. We observed that the application of subacromial decompression and acromioplasty increased from 38 to 84 in ASES scores in the short term.

There are several limitations of the current study. Firstly, despite the prospective collection of data, this study has a retrospective nature. Secondly, the low number of patients is also a deficiency. Thirdly, the absence of a control group is another limitation. However, the strengths of the study are that all patients had isolated impingement syndrome and all were operated by a single surgeon.

There is a consensus that the first treatment of isolated subacromial impingement should be conservative. We report good short-term clinical results of subacromial decompression and acromioplasty in patients who do not respond to conservative treatment.

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