J Surg Med 2017;1(3):49-51.
DOI: 10.28982/josam.351717

Research article
Araştırma makalesi

Journal of Surgery and Medicine

Comparison of open acromioplasty outcomes according to approach type; anterior and lateral

Anterior ve lateral insizyon ile yapılan açık akromioplasti sonuçlarının karşılaştırılması

Kemal Kayaokay [1], Cevat Mirzazade [2], Levent Küçük [2], Erhan Coşkunol [2]

[1] Siverek State Hospital, Department of Orthopedics and Traumatology, Antalya, Turkey
[2] Ege University Medical Faculty, Department of Orthopedics and Traumatology, Izmir, Turkey

Abstract

Aim: Subacromial impingement syndrome appears to be one of the most frequent causes of shoulder pain. Acromioplasty is the surgical intervention modality where conservative treatment no longer gives effect. Even though arthroscopic techniques keep arising popularity, open acromioplasty yet is very often used surgery. Our main goal was to compare clinical success of anterior and lateral open techniques whether or not these techniques affect final range of motion, DASH , UCLA& CONSTANT scores.

Methods: We assembled 37 regularly followed cases (26 female, 11 male) over 18 years old, operated between 2014 and 2016. We then ultimately evaluated comparison among variations such as age, sex, dominant extremity, postoperative follow-up time, approach type, operation duration, acromion type and most recent form where CONSTANT, DASH and UCLA scores , ROM (range of motion), developed complications were assessed. We divided cases to 2 main groups; group 1 anterior approach and group 2 lateral approach. Comparison throughout this particular study mainly went on these 2 groups.

Results: 70.3% (26 cases) were female, 29.7% (11 cases) were male. Mean age was 57.64 ± 9.17 (avg 45-84 years). 75.6 % (28 cases) had symptoms on dominant limb. Postoperative mean follow-up 18.49±5.37 months (avg 8-28 months). Mean operation duration was 35 minutes for group 1 and 37 minutes for group 2. No complications were presented. Patients also filled out prepared subjective survey papers at final clinical examination. Mean CONSTANT score was 88.5 for group 1 and 83.57 for group 2. Postoperative recovery lasted upon 7.1 ± 3.3 weeks (avg 1-12 week) and 6.6 ± 3.9 weeks (avg 1-14 wk) in group 2. CONSTANT, UCLA and DASH scores were evaluated separately and showed no significant difference in ordinary comparison, whereas very same CONSTANT scores were put to odds ratio calculator and presented surprising result; according to preoperative-postoperative comparison, anterior approach was predicted that would have had 2.8 times chance to show better results (80< score) than lateral approach. Same ordinary comparison was performed on UCLA and DASH scores and no significant difference was detected. Although very same odds ratio calculation for UCLA scores appeared to be 2.5 and for DASH it was 1.167. In all three assessment methods anterior approach was more recommendable approach type. Subjective assessments of the patients were as following: 14 patients determined clinically very good and good, 1 patient normal in group 1, where 16 patients were determined very good and good, 2 normal and 3 patients poor according to overall scoring.

Conclusions: There is no significant difference between anterior and lateral approaches according to ROM, various scorings, hospitalization duration. On the other hand, forbsubacromial impingement, open acromioplasty is yet highly reliable, convenient method with short surgery time.

Keywords: Subacromial impingement syndrome, Acromioplasty, Acromion

Öz

Amaç: Subakromiyal sıkışma sendromu omuz ağrısının en sık nedenlerinden biridir. Akromioplasti konservatif tedaviyle sonuç alınamayan hastalarda uygulanan bir tedavi yöntemidir. Artroskopik cerrahi yöntemlerin daha sık kullanılmaya başlanmasına rağmen açık akromioplasti sık uygulanan cerrahi bir yöntemdir. Çalışmamızın amacı anterior ve lateral insizyon sonrası uygulanan akromioplastinin tedavinin başarısını, hareket açıklığını ve DASH, UCLA, Constant skorlamalarını etkileyip etkilemediğini ortaya koymaktır.

Materyal ve Metod: Kliniğimizde 2014-2016 yılları arasında opere edilmiş ve en düzenli takibi olan 18 yaş üzeri 37 (26 kadın, 11 erkek) olgu retrospektif olarak değerlendirildi. Hastaların değerlendirilmesinde cinsiyet, yaş, dominant ekstremite, operasyon süreleri, postop takip süreleri, akromion tipi ve son kontrollerinde Constant omuz skor, DASH skor, eklem ROM(range of motion), komplikasyon kısımlarının olduğu değerlendirme formu kullanıldı.

Bulgular: Hastaların %70,30'u (26 hasta) kadın, %29,70'i (11 hasta) erkekti. Ortalama yaşı 57.64 ± 9.17 (dağılım 45-84yaş) idi. Hastaların 28'inde (%75,6) dominant omuzda şikayetleri mevcuttu. Operasyon sonrası ortalama takip süresi 18,49±5,37 (dağılım 8-28 ay) idi. Ortalama operasyon süreleri anterior insizyon yapılanlarda (grup 1) 35, lateral insizyon yapılanlarda (grup 2) 37 dakikaydı. Hastalarda herhangi bir komplikasyon saptanmadı. Hastaların postoperatif son kontrollerinde hazırlanmış form dolduruldu. Ortalama Constant skoru grup 1 de 88,50, grup 2 de 83,57 idi. Postop şikayetler grup 1 de ortalama 7,1 hafta± 3,3 (dağılım 1-12 hafta), grup 2 de 6,6 hafta± 3,9 (dağılım 1-14 hafta) devam ediyordu. Odds ratio değerine bakıldığında operasyon sonrasında anterior yaklaşımdaki 80 ve üzeri constant skorları lateral yaklaşıma göre 2,8 kat daha fazladır. Postop ve preop DASH skorları farkları açısından anlamlı bir fark bulunmamıştır. Subjektif değerlendirilmede grup 1 hastalarda 14 hasta çok iyi ve iyi, 1 hastada orta düzeyde başarılı, 1 hasta kötü olarak değerlendirildi. Grup 2 hastalarda 16 hasta çok iyi ve iyi, 2 hasta orta düzeyde başarılı, 3 hasta kötü olarak değerlendirildi.

Sonuçlar: Açık akromioplastide uygulanan anterior ve lateral insizyonlar sonrasında abduksiyon ve fleksiyon hareketlerinin açıklığı, skorlamalar, hastanede kalış süreleri arasında fark bulunmamaktadır. Açık akromioplasti subakromiyal sıkışma sendromunda başarı oranı yüksek, operasyon süresi kısa, pratik bir yöntemdir.

Anahtar kelimeler: Subakromiyal sıkışma sendromu, Akromioplasti, Akromion

Corresponding author / Sorumlu yazar:
Kemal Kayaokay
Address / Adres: Siverek Devlet Hastanesi, Ortopedi ve Travmatoloji Kliniği / Antalya / Türkiye
E-mail: kemalkayaokay@gmail.com

Ethics Committee Approval: Ethics committee approval was not received because the study design was retrospective
Etik Kurul Onayı: Çalışma retrospektif olması nedeniyle etik kurul onayı alınmamıştır.

Informed Consent: Informed consent was not received because the study design was retrospective.
Hasta Onamı: Çalışmanın retrospektif olması nedeniyle hasta onamı alınmamıştır.

Conflict of Interest: No conflict of interest was declared by the authors.
Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Financial Disclosure: The authors declared that this study has received no financial support.
Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

Received / Geliş Tarihi: 13.11.2017
Accepted / Kabul Tarihi: 09.12.2017
Published / Yayın Tarihi: 10.12.2017

How to cite / Atıf için : Kayaokay K, Mirzazade C, Kucuk L, Coskunol E. Comparison of open acromioplasty outcomes according to approach type; anterior and lateral. J Surg Med. 2017;1(3):49-51.

Introduction

Subacromial impingement syndrome appears to be one of the most frequent causes of shoulder pain. This clinical condition is a long period in which fundamental structures of shoulder such as acromion, coracoacromial ligament; coracoid process and acromioclavicular joint apply pressure on rotator cuff squeezing it underneath each other causing subacromial bursitis. Neer, described mechanical impingement of 1/3 anterior portion of acromion on subacromial space after 100 scapular dissections in 1970s, furthermore offered acromioplasty as the treatment modality which presented clinically satisfying outcomes [1,2,15]. This clinical condition is shown to significantly reduce life quality and working capacity [3].

Etiology can be due to many reasons. These might be constitutional such as the shoulder joint anatomy, as well as job, recurrent minor/major traumas, consistent limb usage overhead, overusing activities leading to joint inflammation [1,2]. Conservative treatment should be held on for a bit of time before appointing any surgical intervention.

Temporary joint immobilization, activity management, strengthening and ROM advancing exercises, non-steroidal anti-inflammatory medications should be considered. Arthroscopic techniques have been used increasingly in the last 20 years since it was first described by Ellman in 1985 [16].

Material and methods

We assessed 37 patients (26 female, 11 male) retrospectively, performed acromioplasty operated by open anterior and lateral approaches, in our Orthopaedics and Traumatology Clinic of Ege University Hospital. There was 43.2% (16 of them) anterior and 56.8% (21 in total) of lateral incision. Mean age was 57.64 ± 9.17 (avg. 45-84 years). 75.6% (28 out of total) of patients had symptoms on dominant limb.

Postoperative mean follow up was 18.49 ± 5.37 (avg 8-28 months) months. 48.6% (18out of total) patients had symptoms on right side and 51.4% (19 out of total) on the left.

Physical examination, conventional X-rays, MRI, CONSTANT, UCLA and DASH scores were ultimately evaluated based on preoperative and postoperative assessments. All the patients used to complain either from moderate or severe shoulder joint pain as well as painful arc of motion while elevating arm. According to preoperative MRI assessment, all the patients had hyperintensity at acromial bursa, inflammation, edema or tear of the rotator cuff. According to antero-posterior and supraspinatus outlet (Y radiography) imaging, 5.4% (2 out of total) patients had type 1 acromion, 21.3% (8 out of total) patients had type 2 and 72.9% (27 out of total) patients had type 3 acromion.

Preop and postop test data were recorded and statistical analyzes were performed using SPSS 11.0 (SPSS, Chicago, Illinois). The correlation between the direction of scoring and scoring was assessed using the Mann-Whitney U test and odds ratios. A p value <0.05 was considered statistically significant.

Patients having different complications other than subacromial impingement such as partial as well as total rotator cuff rupture, joint instability, cervical neuropathy, calcific tendinitis were excluded out of the study. Patients were operated under regional anesthesia, in bitchair position. Anterior approach was made through the anterior and medial bundles of deltoid muscle reaching its anterior acromial insertion and excising anterior process where lateral approach was made through medial bundles. Subacromial bursectomy was performed and bony process underneath acromion was reamed in both approaches.

Postoperative early rehabilitation is the important final step in achieving appropriate range of motion in shoulder after decompression of subacromial area. We believe, humeral head is being set free of anatomical obstacles and provided with opportunity to travel in maximally possible range. So, for each patient we initiated passive exercises immediately (1st day postoperatively) in most tolerable ranges of motion in pain limit. We removed stitches and bandages at 14th day postoperatively and beginning from 14 days, active exercises were prescribed in supervisory of physiotherapist in certain periods and patients were examined during periodic visits until satisfactory recovery was obtained.

Results

We focused on 2 approaches as we mentioned before. So we were able to design 2 different groups that could be given a chance to compare in many vantages. From now we will be naming anterior approach groups as group 1 and lateral approach group as group 2.

Hospitalization duration was 1.75 ± 0.99 (avg 1-2 days) in group 1 and 1.72±0.99 (avg 1-2 days) in group 2. There was no significant difference between anterior and lateral approaches according to hospitalization durations (p>0.05, table 1). Operation time was 35 minutes (avg 27-40 min) for group 1 and 37 minutes (avg 30-44 min) for group 2. There was no significant difference (p>0.05) between 2 groups. Postoperative full healing was achieved in 7.1±3.3 weeks (avg 1-12 weeks) in group 1 and 6.6±3.9 weeks (avg 1-14 weeks) in group 2. There was no significant difference (p>0.05) between 2 groups. Preoperative CONSTANT score was calculated 34.6±7.5 in group 1 and 33.8±6.7 in group 2, whereas postoperative CONSTANT score was 85.7± 11.3 in group 1 and 83.5±12.6 in group 2. Both of the groups presented significantly satisfying clinical results although there was no significant difference (p>0.05) between calculated progresses.

Table 1. Preop versus postop contstant score

	CONSTANT score		
	Preop	Postop	p
Group1	34.62±7.56	88.50±8.97	0.469
Group 2	33.80±6.77	83.57±12.65	

Postoperative CONSTANT scores were calculated separately via Mann-Whitney U test p=0.46 so there was found no significant difference. According to Odds ratio value group 1 had 2.8 times better promising (80<score) results than in group 2, though. Also all the patients gave the anamnesis of better sleep quality and no awaking night pain appeared after surgery. In the evaluation of the pre-op dash scores, group 1 mean 65.16±13.24 and mean in group 2 was 67.52±9.36. Postop dash scores were 13.01±12.52 in group 1 and 16.64±10.91 in group 2.

Statistically, there was no significant difference in postop and preoperative differences between the 2 groups of taki dash scores. There was no statistically significant difference between the mean postoperative mean UCLA scores ($p>0.05$). Subjective assessments of the patients were as following: 14 patients determined clinically very good and good, 1 patient normal in group 1, where 16 patients were determined very good and good, 2 normal and 3 patients poor according to overall scoring.

Discussion

There appears to be no significant difference regarding anterior and lateral incisions used in open acromioplasty in terms of orthopaedic scores and treatment outcomes. Each mechanical factor applying pressure on rotator cuff could possibly develop chronic inflammation which eventually causes subacromial impingement syndrome. As well as acromion type and impingement alone, trauma, degenerative tendonitis, overusing, inflammation and etc. could play role in developing subacromial impingement syndrome [1,2,4,15]. It is very important to diagnose subacromial impingement appropriately.

According to Matsen persistent pain after subacromial injection negatively affects prognosis for surgical treatment [6,13]. Mean follow-up period for our cases was 18,49±5.37 months (avg 8-28 mth). Patrick et al. published 25 year follow-up for open acromioplasty techniques. 5 cases were reoperated. Only 2 of total cases were performed acromioplasty again [5]. Neer blamed acromion morphology as one of outstanding etiological causes of subacromial impingement, in his study. We observed similar results throughout our study. 73% (27 out of total) had type 3 acromion, 21.6% (8 out of total) had type 2 acromion. [5,7]. We intraoperatively advanced excision of antero-inferior portion of acromion a bit more in each patient we detected persistent impingement while full arm elevation. There was no significant difference between abduction ($p=0.926$) and flexion ($p=0.875$) angle postoperative progress rates. Nowadays arthroscopic techniques have rising popularity for surgical treatment of the impingement syndrome. There are studies declaring arthroscopic techniques more prospering besides open techniques [7,8,10]. Many studies comparing open and arthroscopic techniques report similar results, on the other hand. No significant difference could be presented among pain, ROM and strength in functional assessment of long term outcomes [11,14].

As a matter of fact, there are also studies reporting open techniques more superior [12]. Increasing cosmetic concerns tend many studies present prosperous outcomes for arthroscopic surgery as a remarkably popular treatment modality for the last 20 years, yet having very similar good clinical outcomes in comparison with open technique. There are also studies reporting statistically no significant difference as a treatment modality.

After open acromioplasty performed on a subacromial impingement syndrome, patient satisfaction increases and pain relief while activity as well as rest is remarkable and shoulder joint ROM advances. In comparison of open and arthroscopic techniques, literature reports similar results considering ROM advancement, CONSTANT, UCLA and DASH scores. In our study there was no significant difference among abduction and flexion ranges, scorings, and hospitalization periods in comparison of anterior and lateral approaches, as well. Open acromioplasty is yet highly reliable, convenient method with short surgery time as a treatment option for subacromial impingement syndrome.

Conclusion

In spite of arising popularity of arthroscopic interventions, open acromioplasty keeps its current row among treatment options of subacromial impingement as prospering, practical method with short surgery time. Treatment outcomes remain unaffected regarding anterior and lateral incisions.

References

1. Neer CS 2nd. Anterior acromioplasty for the chronic impingement syndrome in the shoulder: a preliminary report. J Bone Joint Surg [Am] 1972;54:41-50.
2. Neer CS 2nd. Impingement lesions. Clin Orthop 1983;(173):70- 7.
3. Chipchase LS, O'Connor DA, Costi JJ, Krishnan J. Shoulder impingement syndrome: preoperative health status. J Shoulder Elbow Surg 2000;9:12-15.
4. Bigliani LU, Morrison D, April EW: The morphology of the acromion and relationship to the rotator cuff tears. Orthop Trans 10:228, 1986.
5. Chin PY, Sperling JW, Cofield RH, Stuart MJ, Crownhart BS. Anterior acromioplasty for the shoulder impingement syndrome: long-term outcome. J Shoulder Elbow Surg 2007; 16: 697-700.
6. Matsen FA 3rd, Arnts CT. Subacromial impingement. In: Rockwood CA, Matsen FA 3rd, (Editors). The shoulder. Vol. 2, 2nd ed. Philadelphia: W. B. Saunders; 1998: 623-646.
7. Bezer M, Aydin N, Erol B, Kocaoğlu B, Güven O. Late results of arthroscopic and open anterior acromioplasty. Acta Orthop Traumatol Turc 2004; 38:115-119.
8. Altchek DW, Warren RF, Wickiewicz TL, Skyhar MJ, Ortiz G, Schwartz E. Arthroscopic acromioplasty. Technique and results. J Bone Joint Surg [Am] 1990; 72:1198-1207.
9. Lindh M, Norlin R. Arthroscopic subacromial decompression versus open acromioplasty. A two-year follow-up study. Clin Orthop 1993;290:174-176.
10. Valenti P. Arthroscopic subacromial decompression. Chir Main 2006; 25 Suppl 1:22-28.
11. Barfield LC, Kuhn JE. Arthroscopic versus open acromioplasty: a systematic review.Clin Orthop Relat Res 2007;455:64-71.
12. Spangehl MJ, Hawkins RH, McCormack RG, Loomer RL. Arthroscopic versus open acromioplasty: a prospective, randomized, blinded study. J Shoulder Elbow Surg 2002;11:101-107.
13. Rockwood CA, Lyons FR. Shoulder impingement syndrome: diagnosis, radiographic evaluation, and treatment with a modified Neer acromioplasty. J Bone Joint Surg [Am] 1993;75:409-424.
14. Checroun AJ, Dennis MG, Zuckerman JD. Open versus arthroscopic decompression for subacromial impingement. A comprehensive review of the literature from the last 25 years. Bull Hosp Jt Dis 1998;57:145-151.
15. Ertan S, Ayhan E, Güven MF, Kesmezacar H, Akgün K, Babacan M. Medium term natural history of subacromial impingment syndrome. J Shoulder Elbow Surg. 2015 Oct;24(10):1512-8. doi: 10.1016/j.jse.2015.06.007. Epub 2015 Jul 23.
16. Ellman H. Arthroscopic subacromial decompression: analysis of one- to three-year results. Arthroscopy 1987;3:173-81.