



Evaluation of Arthroscopic Debridement, Subacromial Decompression and Biceps Tenotomy without Repair of Rotator Cuff in Chronic Massive Rotator Cuff Tears

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Abstract

Background: Shoulder discomfort and dysfunction are frequently brought on by rotator cuff tears (RCT). The aim of this study was to assess the biceps tenotomy, subacromial decompression, and arthroscopic debridement without Rotors' Cuff restoration in chronic massive RCT.

Methods: This prospective case series study has been carried out on 23 patients diagnosed with chronic severe rotator cuff damage who underwent arthroscopic management. Adult patients were participated in the study with chronic tears, day and nocturnal discomfort that is not always constant. Strength and range of motion (rom) loss were assessed after a 6-month period of conservative therapies (intra-articular injection of corticosteroids and physical therapy) failed.

Results: Patients with chronic massive RCT, operation time highly significantly lower (Median = 80 minutes) than hypothesized time, shoulder abduction technique rose following the operation, the acromio-humeral interval (AHI) score were highly significantly higher than hypothesized score. Post Elbow and Shoulder Surgeons of America really significant higher (Median = 90) than pre ASES (Median = 22), $p < 0.0001$

Conclusions : This procedure, which is rapid and simple with few side effects and consistent long-term benefits, is suitable for treating chronic large RCT, especially in older patients. The approach enhanced the studied patients' performance, range of motion, and discomfort, per the results.

Keywords: Arthroscopic Debridement, Decompression of the Subacromia, Biceps surgery, Torn rotator cuff.

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Introduction:

Similar to diabetes mellitus, hypertension, congestive heart failure, myocardial infarction, and depression, rotator cuff tears (RCT) are frequent causes of shoulder discomfort and dysfunction^[1-3].

Not all rips are repairable surgically, despite significant advancements in the surgical therapy of RCT. The growth of the lesion with fatty deterioration and contraction of the muscle tissue characterises an RCT's normal course^[4, 5].

Although significant mobilisation of the tissues to mend the rip could be achieved in certain individuals, the clinical outcomes are frequently subpar and have a high failure rate, as seen by magnetic resonance imaging (MRI) or ultrasonography (US) imaging^[6]. The variables that may cause the lesion to not be repaired include long-lasting symptoms, a small acromio-humeral interval (> 5 mm), and a high degree of fatty degeneration of the muscle and tendinous tissue^[7]. DeOrío and Cofield^[8] classified massive RCT alludes to tears that are more than five cm in either the medial-lateral or anterior-posterior planes., Whereas Gerber considered serious rips to be those

that included complete tears of at least 2 different tendons^[9].

Massive tears, regardless of classified, can be challenging to deal with, but a number of remedies are available based on patient and tear characteristics in addition to a number of many other factors. Activity modification, physical therapy to strengthen the deltoid and periscapular muscles, oral anti-inflammatory drugs, or corticosteroid injections too are instances of nonoperative care. Surgical possibilities include tendon transfers, arthroscopic sub-acromial spacer implant, debridement, decompression, biceps tenotomy or tenodesis, partial rotator cuff repair, rotator cuff repair with patch augmentation, and reverse total shoulder arthroplasty^[10].

Debridement is the simplest medical procedure to cure a massive, incurable RCT. This has historically exclusively been applied to chronic low demand sufferers who have good gleno-humeral motion but persistent pain after conservative treatments. It is basically understood that the biceps, sub-acromial bursitis, and joint synovitis are pain makers in the context of rotator cuff dysfunction. Biceps tenotomy or tenodesis,

subacromial bursectomy with limited acromioplasty, and joint debridement are now all variants of joint debridement^[10].

The coracoacromial arch is a critical element in the containment of the humeral head, especially because when rotator cuff is gone. A high riding humerus is also limited by the acromion itself in the presence of the large rotator cuff. Debridement therefore should avoid breaking these structures as this leads to poor effects. To cope with pain management without removing key elements like the CA ligament and the acromion, some are advising a reversed arthroscopic subacromial decompression (RASD)^[10].

Hence, we conducted our study to evaluate the biceps tenotomy, subacromial decompression, and arthroscopic debridement without rotator cuff repair in chronic massive RCT.

PATIENTS AND METHODS:

For 23 patients, this prospective case series inquiry was carried out. Diagnosed with chronic massive RCT who underwent arthroscopic management. Adult patients were participated in the study with chronic tears, day though overnight pain which is not typically constant. Patients with traumatic tears, earlier shoulder surgery, severe glenohumeral arthritis cervical nuclear sickness, lesions of a capsule-ligament, inflammatory arthritis. Exclusion criteria were shoulder instability, earlier glenoid, bigger, and smaller tuberosity fractures..

A detailed physical examination of both shoulders was done. All patients had positive impingement and Jobe empty can tests. Special tests for supraspinatus, infraspinatus, teres minor and subscapularis were done as well as detailed cervical examination and a thorough neurologic assessment and pre-operative radiological evaluation included Plain X-ray of the shoulder.

MRI was done for all patients to confirm the chronic massive RCT and to exclude other associated disorders of the shoulder. When a continuous band of fluid travels the breadth of the rotator cuff, from the gleno-humeral arch to the sub-acromial bursa, on T2-weighted images, it is readily apparent that a tear..

Procedure: During the administration of anaesthesia, each patient received a standard one-gram IV injection of third-generation cephalosporin. Each patient wore above the elastic stockinet throughout surgery to prevent DVT and, at the same time, to enhance venous return to the heart while seated. After pre-anesthetic sedation, general anaesthesia was given to every patient, along with appropriate intraoperative head support and hypotensive anaesthesia.. For all patients who were kept in the sitting posture, the beach-chair position was employed. 85o with head supported, and knees elevated and flexed over a pillow. The affected shoulder was sufficiently away from the

table with arm hanging free at side of the patient with small sand bag behind the affected shoulder. Using the Deoreo and Cofield approach, the magnitude of the rotator cuff tear was defined by its largest diameter; all of the patients were chronic major tears less than 5mm. Synovectomy, labrum rips that needed to be repaired, the removal of chondromalacia, and the debridement of loose RCT fragments made up intra-articular surgery. Each time the long head of the biceps (LHB) was evaluated, it was abnormal and found that it was spontaneously ruptured in 2 cases preoperatively. The sub-acromial space was then probed also with arthroscope. At the junction of the anterior and posterior parts of the acromion, a lateral portal was established. It was important to do a full bursectomy in the event of a severe rotator cuff strain to stand out in a crowd. The propensity of the lateral tendon margin to be shortened to the greater tuberosity with the arm in neutral abduction and rotation was assessed by dragging the supraspinatus and infraspinatus tendons laterally and anteriorly.

Postoperative regimen and Rehabilitation: Arm sling was used for few days, postoperative ice pack was used over the operated shoulder for 48hs. to achieve hemostasis and better pain relief, postoperative analgesia was given for all patients, Active range of motion was authorized from the second day post surgery, and clinic visits were set for 2, 4, 8, and 12 weeks after surgery. After surgery, all patients proceeded in a standard shoulder rehabilitation that begun with full active range of motion on the second day and ended using strengthening exercises mainly centered on the rotator cuff.

Outcomes: Function, range of motion, and alleviation of discomfort This was conducted using the American Shoulder and Elbow Surgeons (ASES) rating scale. Acromio-humeral range (AHI), This was performed using traditional radiology.

STATISTICAL ANALYSIS

SPSS technique was used to analyze the data (version 22; SPSS Inc, Chicago IL). For numerical data, we chose mean and standard deviation, and for categorical data, we used percentage. The data's normality was evaluated that use the Kolmogorov-Smirnov test. Also, the Wilcoxon rank sum test (for non-parametric data) was used to analyze the mean variances between the two timeframes before and after the procedure. A P-value of 0.05 or less was judged as statistically significant.

RESULTS:

The mean age was 61 ± 4 years, and 13 & 11 were male and female, respectively. The affected side were the right in 17 (74%) of the participants, and

the dominant side were the right arm in all patients. **(Table 1).**

Table (1): Baseline characteristics of the studied patients

			Mean± SD
Age			61± 4
Age by gender	Female	Age	62 ± 4
	Male	Age	60 ± 3
			Number
Gender	Female		10
	Male		13
Side affected	Left		6
	Right		17
Dominance	Left		0
	Right		23
Smoking	Non-Smoker		18
	Smoker		5
Hypertension	Hypertensive		4
	Non-hypertensive		19
Diabetes Mellitus	Diabetic		5
	Non-diabetic		18

Data was presented as mean ±SD, or numbers. SD: Standard deviation, Of the 23 included participants, 9 have mild working load (employee) while 14 participants have hard working load (7 farmers, one baker and 6 housewives) (Figure 1).

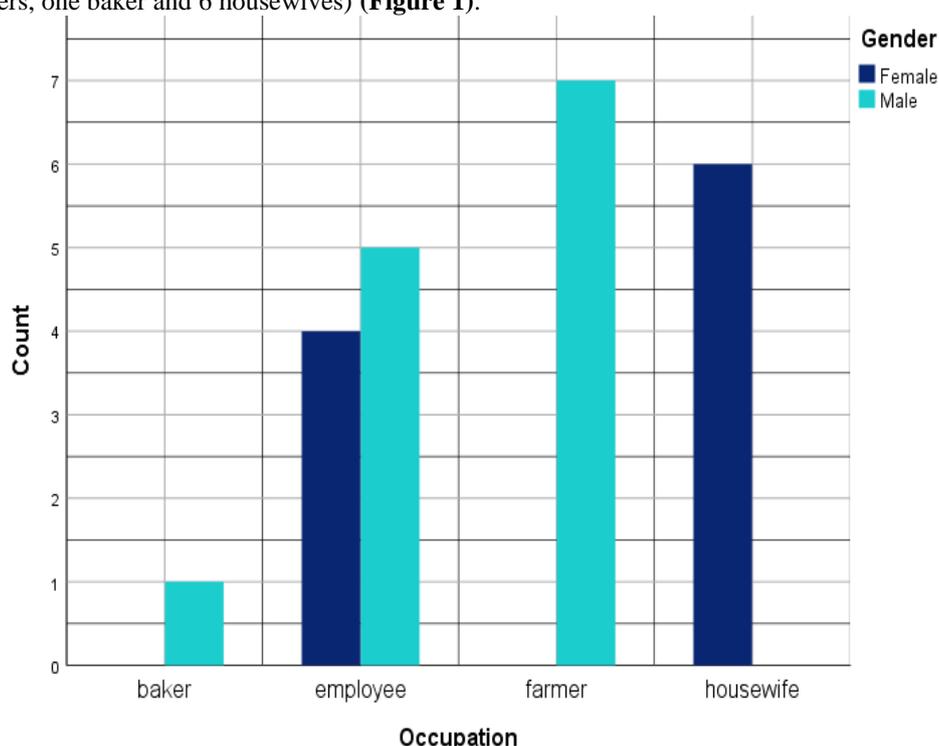


Figure (1): Occupation by gender

Patients with chronic massive RCT, operation time highly significantly lower (Median = 80 minutes) than hypothesized time (Median = 120 minutes), $p < 0.0001$.

We measured ASES score pre-operative, the mean of the score were 20, the diabetic patients had significantly lower score ($p < 0.0001$) and measured the ASES score 18 months post-

operative, with mean of the score 78. The pre ASES, $W = 0.196$, $p = 0.023$, and the post ASES, $W = 0.315$, $p < 0.001$, were both significantly non-normal.

Patients with chronic massive RCT, post ASES were highly significantly higher (Median = 90) than pre ASES (Median = 22), $p < 0.0001$. (Figure 2).

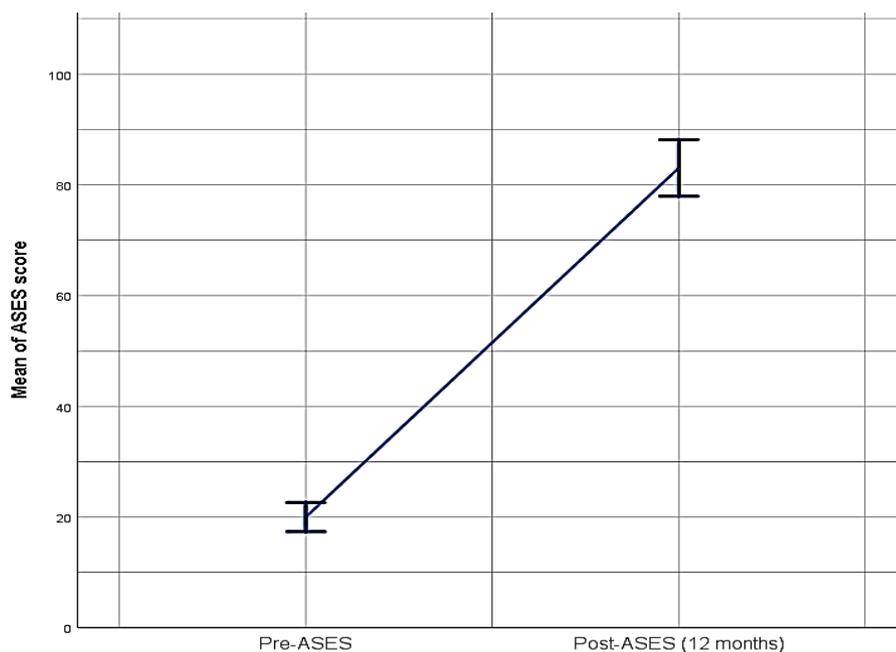


Figure (2): line graph to illustrate the difference between pre-ASES and post-ASES score.

After the surgery, the mean shoulder abduction increased (P 0.001). Each patient's improved postoperative pain was tightly linked with their improved motion range. The authors found that, in 19 patients, the mean shoulder forward flexion rose from 87° before the operation to 148° after the

surgery, although in 4 patients, the mean shoulder forward flexion was little than 120°. Participants in the large RCT had AHI levels that were highly significantly higher than anticipated (median = 7) (median = 6 minutes), p <0.0001 (**Table 2**).

Table (2): pre-and post ASES and AHI score at 12x month follow up.

	Mean ± SD
Operative time (minutes)	78 ± 12
Pre-ASES	20 ± 6
Post-ASES (12 months)	83 ± 12
AHI (12 months)	7 ± 1

Data was presented as mean ±SD.

DISCUSSION

Massive RCT is a term frequently employed to refer to extremely large tears that are especially challenging to comeback trail. Massive RCT is most frequent among older people and is linked to a poor prognosis [11-13].

Our cohort of patients comprised 23 patients who were highly disabled duo to chronic massive RCT with mean ASES score of 20, all patients showed improvement of the ASES score postoperatively to a mean of 78 12 months postoperatively. This improvement is very satisfactory to our group of old low demand patients with mean age of 61 years. The 12 months postoperative ASES score is inferior by 17 in diabetics and heavy smokers, while the best results found in non-diabetic, non-smoker with light works patients with 12 months postoperative ASES score above 90.

In our short term study there was no decrease in the AHI value (mean 7 mm) with no hardly a superior head migration nor arthritic shoulder joint modifications, we recommend longer follow up studies to accurately evaluate these changes. In our study the mean operative times were 78 minutes which is suitable for old patients with numerous comorbidities.

To certain researchers, up to 30% of all RCTs might be deemed catastrophic depending on the extent of the tear and the severe muscle atrophy [14]. Fenlin et al [15]. pointed out that in order to minimize suffering and improve motion range in older individuals with a limited range of motion, debridement and decompression should be performed out. So far, in order to regain strength and performance in youths, the repair must be maintained.

Although no gain in muscle endurance, Veado and Rodrigues^[16] have also seen reductions in pain and the University of California, Los Angeles (UCLA) score in 22 irreparable RCT patients who underwent arthroscopic debridement.

Massive RCT close interpersonal biceps lesions, and they're a significant component of shoulder ache due to the long head of the biceps tendon^[17]. Walch et al^[18] 307 patients with massive RCT whom have biceps tenotomy only reported an 87% satisfaction rating. Yet, after such a mean follow-up of 4.5 years, there was no influence on how cuff tear arthropathy evolved.

Boileau et al^[19] confirmed that catastrophic RCT associated with a biceps lesion led in agony and dysfunction, and that both arthroscopic biceps tenotomy and arthroscopic biceps tenodesis greatly lowered those manifestations. Patients who had tenotomies or tenodesis got the same outcome. In cases of teres minor atrophy, actual preoperative pseudo-paralysis, and significant cuff rip arthropathy, outcomes were mediocre.

Its first open resection towards using tubero-plasty by Fenlin et al.^[15] The goal is to restructure the superior tuberosity and remove the exostoses on the humerus to produce a smooth, congruent acromioclavicular articulation. The coraco-acromial ligament is left untouched all across the therapy, and acromioplasty is not conducted. The UCLA score increased from a mean of 9.3 preoperatively to a mean of 27.7 postoperatively in 21 patients even during length of a mean of 27 months, and the endpoints were satisfying in 95% of the patients (12, excellent; 6, good; and 1, fair).

Scheibel et al.^[20] demonstrated what was termed as a reversed arthroscopic sub-acromial decompression strategy for tubero-plasty. Then do the tubero-plasty, the subacromial space and glenohumeral joint must be picked up using an arthroscopic operation. After surgery, 23 patients in the research were followed for a median of 40 months; during a certain span, the Constant score raised and significant advances in pain and range of motion were seen.

Verhelst et al.^[21] After undoing arthroscopic subacromial decompression, 34 shoulders were followed with RCTs for a mean of 38 months. Range of motion was increased, and the modified Constant score climbed from a mean of 34.9% to 84.0%. The severity of glenohumeral osteoarthritis intensified as the mean acromio-humeral distance (AHD) decreased by 2.58 mm in the meantime. Inevitably, they ultimately decided that dementia people with incurable RCTs could benefit as from operation.

Verhelst et al.^[21] biceps tenotomy and sub-acromial decompression have been demonstrated as better therapies for widespread, permanent RCT with good mid-term benefits. In the event that this

procedure was fails, reverse shoulder arthroplasty was the contingency plan.

The consequences of this trial, which included four hypertension patients, were basically equivalent, but the intraoperative procedures presented a hurdle since less bleeding and greater visibility are required for regulated stable hypotension during arthroscopy. This arthroscopic non-repair approach is quite helpful when faced with extreme RCT with retracted, atrophied, fatty-infiltrated muscles that cannot be repaired. Extremely early active ROM (second day post-surgery) is a great component for this approach to help senior citizens minimize stiffness. There were some flaws in this study, such as the brief follow-up duration and the omission of a control group undertaking various methods of therapy.

CONCLUSIONS:

This process is a promising option for the treatment of chronic massive RCT, particularly among elderly individuals as it is uncomplicated and rapid with little side effects and dependable long-term consequences. The strategy enhanced the tested patients' performance, range of motion, and soreness, per the results.

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Conflict of Interest: Nil

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