

## Comparison between Manipulation and Arthroscopic Capsular Release in Management of Primary Adhesive Capsulitis

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### Abstract

**Background:** It is currently unclear as to whether there is a difference in the clinical effectiveness of an arthroscopic capsular release compared to a manipulation in patients with primary adhesive capsulitis.

**Aim of Study:** The aim of the work was to compare the functional outcome in shoulder ROM, patient-reported outcomes and complications when comparing MUA and arthroscopic capsular release in the management of adhesive capsulitis.

**Material and Methods:** This study was conducted in Cairo University Hospitals between January 2014 and April 2018. The study was carried on 60 patients with primary frozen shoulder were included in the study. Arthroscopic capsular release was done for 30 patients (30 shoulders affection) (Arthroscopic group A), while manipulation under general anesthesia was done for 30 patients (30 shoulders affection) (Manipulation group B). All patients were evaluated clinically with the range of motion (ROM), American Shoulder and Elbow Surgeons (ASES) score, and visual analogue scale (VAS) pain score.

**Results:** No significant difference or association regard complications between groups, Satisfaction significantly occurred regards lower HbA1C in both group.

**Conclusion:** Both arthroscopic capsular release and MAU are effective modalities for management of adhesive capsulitis. However, arthroscopic capsular release leads to better improvement in the ROM than MUA. A low overall complication rate was observed in both groups.

**Key Words:** Arthroscopic capsular release – Manipulation – Primary adhesive capsulitis.

### Introduction

**FROZEN** shoulder, a frequently encountered disorder of the shoulder, has been well recognised

since the early 1900s. Although benign, it has great impact on the quality of life of patients [1].

The incidence in the general population is at least 2%. Females are more often affected and it is a condition of middle age (40-60-year olds). The condition may affect the opposite side in up to a fifth of cases. However recurrence is rare [2].

Frozen shoulder can be broadly divided into two categories: Primary, in which there are no obvious causes, and secondary, where a cause is identified (from history, clinical examination and radiographic appearances) [1].

The pathology of frozen shoulder includes a chronic inflammatory response with fibroblastic proliferation which may be immunomodulated [3].

The natural history of the condition follows a pattern of recovery which moves through three phases: The 'painful phase' lasting three to eight months, the 'adhesive phase' lasting four to six months, and the 'resolution phase' lasting five to 24 months.

However, the literature suggests that for many patients the symptoms do not resolve completely, leaving them with prolonged pain or stiffness [4].

Frozen shoulder is a clinical diagnosis. The three hallmarks of frozen shoulder are progressive shoulder stiffness, severe pain (especially at night) that results in the inability to sleep on the affected side and a near complete loss of passive and active external rotation of the shoulder [1].

Frozen shoulder usually responds to gentle physical therapy or, if that fails, closed manipulation with the patient under anesthesia is used. Another

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technique for the management is arthroscopic capsular release [5].

Initial treatment of frozen shoulder is non-operative with emphasis placed upon control of pain, and use of regular stretch exercises program [6].

The technique for manipulation under general anesthesia for patients with frozen shoulder after failure of conservative treatment has been used for many years with production of audible and palpable release of adhesions [6].

Arthroscopic release can be used after failure of conservative therapy aiming at releasing contracted tissues to regain the range of motion in patients with frozen shoulder [7].

Therefore, the aim of the work was to compare the functional outcome in shoulder ROM, patient-reported outcomes and complications when comparing MUA and arthroscopic capsular release in the management of adhesive capsulitis.

### Patients and Methods

This study was conducted in Cairo University Hospitals between January 2014 and April 2018. The study was carried on 60 patients with primary frozen shoulder were included in the study. Arthroscopic capsular release was done for 30 patients (30 shoulders affection) (Arthroscopic group A), while manipulation under general anesthesia was done for 30 patients (30 shoulders affection) (Manipulation group B).

Patients with history of pain and restriction in shoulder motion without previous significant injury or trauma, Limitation of range of motion in at least one plane, Normal shoulder plain X-ray with no secondary pathology (e.g.: Osteoarthritis or traumatic fracture) and All patients to be diabetic type II non thyroid with idiopathic primary adhesive capsulitis were enrolled in our study.

Preoperative Evaluation includes Careful history taking and assessment of the patients' symptoms or disabilities. Special emphasis was laid on the grading of pain, ability to do different daily activities like combing the hair, dressing, doing overhead activities, and hand behind the back activities. Patients' needs were assessed and the dominant hand noted. Medical history was taken with special emphasis on diabetes mellitus and cardiac diseases. History of the different treatments received for the condition, their duration, and effect was also noted.

Full clinical examination of the shoulder was done for every patient with special emphasis on tests to assess the active and passive range of motion in different planes, tests for the scoring of patients, and tests to exclude other related conditions. The American Shoulder and Elbow Society Shoulder Score (ASES) and the VAS pain score was used.

Plain radiology was done for all the patients. It was always requested as an anteroposterior view for the shoulder, MRI was requested for all patients to exclude another underlying pathology to exclude cases with secondary frozen shoulder. Thickening of the joint capsule was seen.

Closed manipulation was performed in those patients undergoing MUA (MUA group), with the patient supine under general anesthesia. First, the shoulder was moved into flexion until the point of resistance. Then, shoulder was externally rotated with the arm in 90° of abduction. Next, stretching was performed in internal rotation at 90° of abduction. Then, cross-body adduction will be performed. Finally, the arm was gently externally rotated at 45°, 35°, and 0° of abduction to attain the maximum movement in all positions. Patients arms were placed in an abduction humeral splint at 80° of abduction [8].

In those undergoing arthroscopic capsular release (ACR group), induction of general anesthesia and the patient positioning in the beach-chair position was done. The arthroscope was inserted through a standard posterior portal. After visualizing the joint, an anterior portal was then made through the rotator interval. A systematic inspection was made to assess for the severity of any synovitis present. The surgical technique involving resecting all tissue in the rotator interval, initially from the anterior border of supraspinatus to the superior border of subscapularis. The resection was then extend medially behind and as far as the base of the coracoid process, then around the upper border of subscapularis anteriorly and posteriorly. In those patients with persisting tightness, the release was then extend down the anterior capsule to the five thirty position [9].

Examination under anesthesia was done to every patient to reveal the actual passive range of motion after elimination of pain.

The same protocol as for arthroscopic patients starting from the same day of the operation was followed regarding exercises, analgesia, physiotherapy and scoring.

Adequate analgesia was given until the patients' pain decreased in the postoperative period in order to allow for the rehabilitation exercises without pain in the form of: NSAIDs, pethidine.

*Statistical analysis:*

Data collected throughout history, basic clinical examination, laboratory investigations and outcome measures coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) (Statistical Package for the Social Sciences) software for analysis. According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean ± SD, the following tests were used to test differences for significance; difference and association of qualitative variable by Chi square test ( $\chi^2$ ). Differences between quantitative independent groups by *t*-test or Mann Whitney, paired by paired *t* or sign test, correlation by Pearson's correlation or Spearman's. *p*-value was set at <0.05 for significant results & <0.001 for high significant result. Data were collected and submitted to statistical analysis. The following statistical tests and parameters were used. The chi square test used to

compare two groups regarding the distribution of different variables. The *t* statistic to test whether the means are different can be calculated as follows.

**Results**

In the arthroscopic group, 6 patients (20.0%) had diabetes mellitus and hypertension, 24 patients (80.0%) had only diabetes mellitus. In manipulation group, 6 patients (20.0%) had diabetes mellitus and hypertension, 24 patients (80.0%) had only diabetes mellitus (Table 1).

Regard satisfaction all patient in both group were not satisfied before procedure but 90% of first group were satisfied post procedure and only three cases were not satisfied because of pain and in other group 76.7% were satisfied and 7 cases were not because of pain and limitation of motion and the improvement was significant in both group ( $p < 0.001^{**}$ ) (Table 2).

No significant difference or association regard complications between groups (Table 3).

Satisfaction significantly occurred regard lower HbA1C in both group (Table 4).

Table (1): Associated medical diseases.

	Group		Total	$\chi^2$	<i>p</i>
	Arthroscopic group	Manipulation group			
<i>Co morbidity:</i>					
HTN & DM	6 20.0%	6 20.0%	12 20.0%	-	-
DM only	24 80.0%	24 80.0%	48 80.0%		
Total	30 100.0%	30 100.0%	60 100.0%		

Table (2): Satisfaction after procedure distribution.

	Group		Total	$\chi^2$	<i>p</i>
	Arthroscopic group	Manipulation group			
<i>Satisfaction post:</i>					
Not:					
N	3	7	10	1.92	0.16
%	10.0%	23.3%	16.7%		
Satisfied:					
N	27	23	50		
%	90.0%	76.7%	83.3%		
Total:					
N	30	30	60		
%	100.0%	100.0%	100.0%		

Table (3): Complications distribution between groups.

	Group			$\chi^2$ / Fisher	<i>P</i>
	Arthroscopic group	Manipulation group	Total		
<i>Still pain:</i>					
No:					
N	21	21	42	0.00	1.00
%	70.0%	70.0%	70.0%		
Yes:					
N	9	9	18		
%	30.0%	30.0%	30.0%		
<i>Infection:</i>					
No:					
N	26	30	56	2.54	0.12
%	86.7%	100.0%	93.3%		
Yes:					
N	4	0	4		
%	13.3%	0.0%	6.7%		
<i>Movement:</i>					
No:					
N	29	25	54	2.96	0.085
%	96.7%	83.3%	90.0%		
Yes:					
N	1	5	6		
%	3.3%	16.7%	10.0%		
Total					
N	30	30	60		
%	100.0%	100.0%	100.0%		

Table (4): Correlation between satisfaction and HbA1C.

Group	Satisfied	Not	<i>t</i>	<i>p</i>
<i>Arthroscopic group:</i> HbA1C	5.85±0.95	8.5±0.5	-4.62	0.00**
<i>Manipulation group:</i> HbA1C	6.04±1.11	8.14±0.85	-4.52	0000**

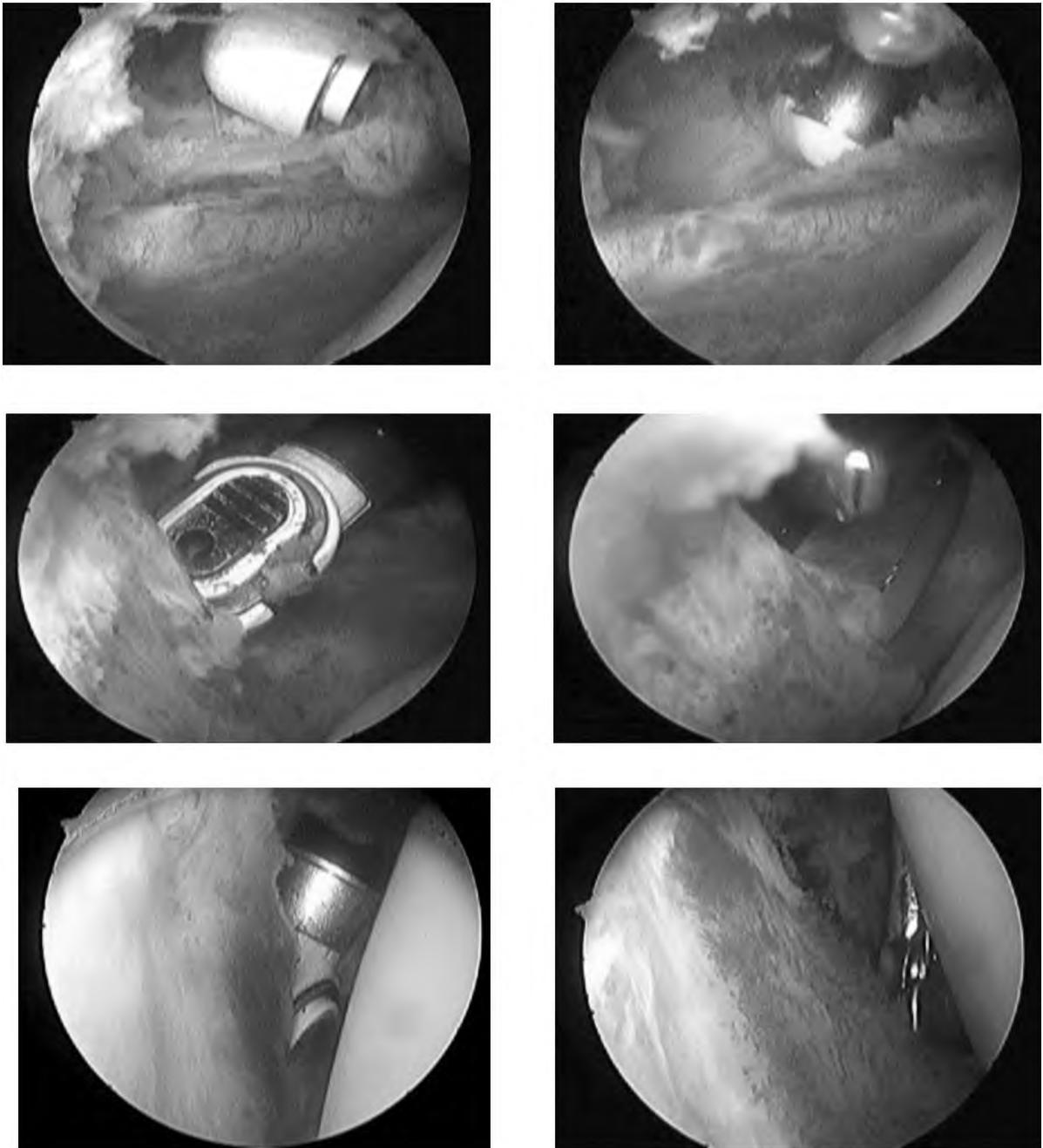


Fig. (1): Release of Anterior capsule and the rotator interval.

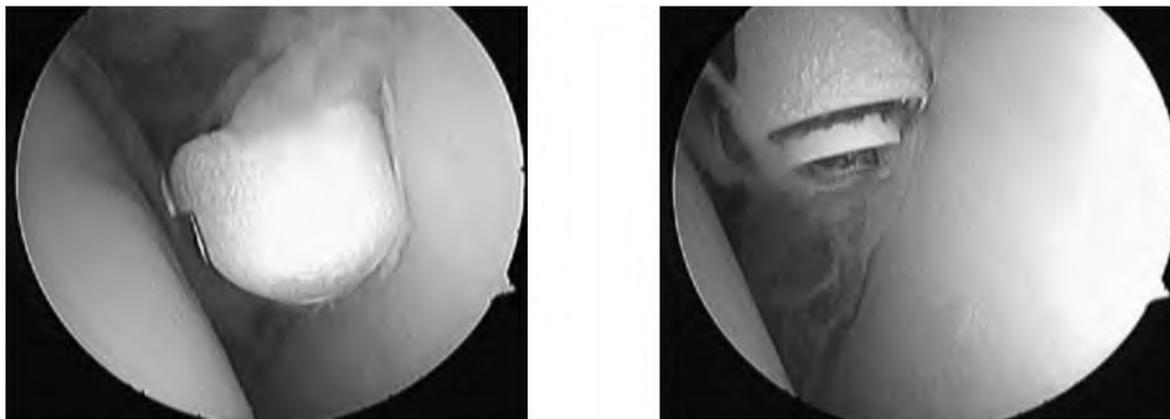


Fig. (2): Release of the posterosuperior capsule.



Fig. (3): Manipulation Technique.

### Discussion

Adhesive shoulder capsulitis, or arthrofibrosis, describes a pathological process in which the body forms excessive scar tissue or adhesions across the glenohumeral joint, leading to pain, stiffness and dysfunction. It is a debilitating condition that can occur spontaneously (primary or idiopathic adhesive capsulitis) or following shoulder surgery or trauma (secondary adhesive capsulitis). Painful stiffness of the shoulder can adversely affect activities of daily living and consequently impair quality of life [10].

The goal of treatment of adhesive capsulitis is to restore the shoulder to a painless and functional joint. Because some patients with adhesive capsulitis improve spontaneously, treatment varies greatly from benign neglect to invasive open capsulotomy. There is no universal treatment algorithm, and therefore treatment should be patient-specific. For patients with early stages of adhesive shoulder capsulitis, physical therapy is the first line of treatment. Surgical options for treatment of adhesive shoulder capsulitis are generally reserved for

patients with persistent symptoms refractory to conservative management [11].

Manipulation under anaesthesia (MUA) is believed to be the most widely used non-conservative treatment option for these refractory cases. With MUA, the tight shoulder joint capsule is stretched and torn with manipulation. It is a time-efficient procedure and relatively easy to perform, resulting in rapid restoration of the ROM of the shoulder joint and reduces the symptoms of frozen shoulder. However, it is argued that it cannot be seen or felt what other structures than the joint capsule are damaged during manipulation [12].

Recently, arthroscopic capsular release was proposed as an effective and safe method for treatment of adhesive shoulder capsulitis. Arthroscopic capsulotomy has two key advantages. First, diagnostic arthroscopy confirms the diagnosis and rules out other potential causes of a painful stiff shoulder. Second, compared to MUA and hydrodilatation, it allows for direct visualization of the tightened CHL, thickened rotator interval and contracted capsule to ensure adequate release [13].

Despite growing number of published literature that supports the efficacy of arthroscopic capsular release for adhesive shoulder capsulitis, there is, still, a scarcity in high-level evidence that compares the safety and efficacy of arthroscopic capsular release versus MUA.

Thus, we conducted the prospective study in order to compare the functional outcomes, patients-reported outcomes, and incidence of complications between arthroscopic capsular release and MUA for adhesive shoulder capsulitis. The present study included 60 patients with adhesive shoulder capsulitis who were allocated in equal ration to either arthroscopic or MUA groups.

Demographic studies have shown that most patients with adhesive capsulitis (84.4%) fall within the age range of 40 years to 59 years. On the other hand, it is estimated that 70% of patients with adhesive shoulder capsulitis are women [14].

In the present study, the mean age of the included patients was  $50.83 \pm 7.33$  years Arthroscopic group and  $51.7 \pm 5.91$  years in MUA. The majority of patients were males in both groups.

In line with our findings, Inayat and colleagues [15] carried out a cross-sectional study on a systematically randomized sample of 80 patients with diabetes. Thirty-three of the total 80 respondents included in the study were diagnosed with frozen shoulder. The majority of patients were aged 41-60 years old. However, in contrary to our findings, 70% of the patients were females.

Additionally, Ding and colleagues [16] conducted a cross-sectional study to evaluate the risk of depression and anxiety in patients with primary frozen shoulder, and to explore the relationship between psychological disorders and disease status. In this study, 78, out of the 124 patients, were women.

The exact causes of such heterogeneity between our findings and the abovementioned studies in term of gender distribution are unclear; however, it can be attributed to various methodological factors such as sample size of the included studies and patients' characteristics. The quality of the studies may be another factors explaining this heterogeneity.

Adhesive capsulitis is associated with diabetes, thyroid disease, cerebrovascular disease, coronary artery disease, autoimmune disease and Dupuytren's disease. Interestingly, both type I and type II diabetic patients are at increased risk of developing adhesive capsulitis, with prevalence of 10.3% and 22.4%, respectively [17].

In our cohort, 80% of the patients in both group had DM only and the rest had HTN and DM.

However, other reports showed much more lower prevalence of diabetes in patients with adhesive capsulitis. For example, Malavolta and colleagues [18] evaluated whether Asian ethnicity is a risk factor for the development of adhesive capsulitis. A cross-sectional study comparing the rate of adhesive capsulitis in individuals of Asian ethnicity with that of other ethnicities. A total of 1331 patient records were evaluated and after applying the selection criteria, 814 patients remained. Almost 42% of the patients were diabetic.

Additionally, Lamplot and colleagues [19] recruited 75 patients diagnosed with idiopathic adhesive capsulitis and treated with a single intra-articular glenohumeral injection of local anesthetic and corticosteroid. Fifteen percent of the patients were diabetic.

Patients with adhesive capsulitis usually present with progressively worsening shoulder pain over weeks to months followed by significant limitation in shoulder motion. On the other hand, frozen shoulder usually affects only one shoulder (left or right) [20].

In the present study, the major of the patients presented with pain (70%), followed by limitation of movement (30%). In addition, 60% of the patients had frozen shoulder in the right, dominant, side.

In line with our findings, Cho and colleagues aimed to investigate the demographic and clinical characteristics of patients with primary frozen shoulder in a Korean population. A total of 1,373 patients whose shoulders were diagnosed with primary frozen shoulder across 11 resident-training hospitals were reviewed retrospectively. The frozen shoulder involved the right arm in 60.7% of patients and the most common symptoms was experienced nocturnal pain [21].

With regard to the primary outcomes of the present study, there were statistically significant improvements in the activity during the follow-up in both MUA and arthroscopic groups. In addition, the patients, in both groups, demonstrated significant improvements in the range of motion (ROM) in flexion, abduction, external rotation, and internal rotation.

In concordance with our findings, Placzek and colleagues [22] assessed the effect of manipulation on ROM, pain, and function in patients with adhesive capsulitis. Thirty-one patients underwent brachial plexus block followed by translational manipulation of the glenohumeral joint. Passive ROM increased significantly for flexion, abduction, external rotation, and internal rotation.

Additionally, Roubal and colleagues [23] aimed to develop and describe an alternative treatment method that utilizes glide manipulation under interscalene brachial plexus block. Eight patients (four females and four males), age 31-55 years, were treated conservatively for adhesive capsulitis of the shoulder. There were significant increases in passive ROM for flexion, abduction, external rotation, and internal rotation.

Kanbe [13] investigated the long-term clinical outcome and its related factors after shoulder arthroscopic capsular release for frozen shoulder with technical points in 255 patients. The ROM for flexion, abduction, external rotation, and internal rotation.

In their series, Le Lievre and Murrell [24] observed that all 43 patients had improvement shoulder function and ROM following arthroscopic capsular release at a long-term follow-up of 7 years.

On the other hand, we found that there were statistically significant improvements in pain scores in both MUA and arthroscopic groups.

Similarly, Kraal and colleagues [12] conducted a systematic review in EMBASE, MEDLINE and The Cochrane Library databases in June 2016 for assessment of efficacy of MUA. The final selection of included studies comprised a total of 858 frozen shoulder patients that were treated with MUA. A significant reduction in weighted mean pain scores after MUA was found in the short, middle and long term. The mean reduction in VAS for pain after MUA in FS patients was 3.5 points (SD 3.4) within six weeks, 4 points (SD 1.5) within six months and 5.1 points (SD 1.8) after >12 months.

In addition, Vastamäki and colleagues [25] retrospectively reviewed 20 patients (22 shoulders; 13 women) with spontaneous frozen shoulder who underwent MAU. A significant reduction in weighted mean pain scores after MUA was found in the short, middle and long term.

Uppal and colleagues [26] conducted a systematic review in PubMed to assess the role of arthroscopy in the treatment of frozen shoulder. Embase and Cochrane databases were also searched with the same search strategy and the references of selected journals were scanned to try to find more studies. Nine studies were eligible for review. This review includes the treatment of 419 patients with primary frozen shoulder. All studies demonstrated a rapid statistically significant improve in post-operative pain scores following capsular release.

Moreover, Smith and colleagues [27] conducted a prospective study to assess the immediate and long-term effectiveness of arthroscopic capsular release in a large cohort of patients with a precise and isolated diagnosis of stage II idiopathic frozen shoulder. The study included 136 patients with a stage II arthroscopically confirmed idiopathic frozen shoulder. Fifty percent achieved good pain relief within a week and eighty percent within six

weeks of arthroscopic capsular release. The mean preoperative visual analogue scale pain score was 6.6 and the mean postoperative score was 1.0.

The Constant-Murley Score (CMS) was presented in 1987 as an instrument to evaluate overall shoulder function, irrespective of diagnosis. The CMS scale assesses four aspects related to shoulder pathology; two subjective: Pain and activities of daily living and two objective: ROM and strength. The subjective components can receive up to 35 points and the objective 65, resulting in a possible maximum total score of 100 points (best function). Pain and ADL are answered by the patient; ROM and strength require a physical evaluation and are answered by the orthopaedic surgeon or the physiotherapist [28].

In the present study, we found statistically significant improvements in CMS during the follow-up in both MUA and arthroscopic groups.

Likewise, Wang and colleagues [29] revealed the short- and long-term outcomes for treatment of frozen shoulders by MUA and compared these results in patients with and without non-insulin dependent DM by adjusted Constant score. There was statistically significant improvement in CMS during the follow-up after MUA.

Similarly, Jerosch and colleagues [30] assessed the effectiveness of arthroscopic capsular release carried out for refractory cases of both primary and secondary adhesive shoulder capsulitis that were not responsive to at least 6 months of prior conservative therapy. Arthroscopic 360-degree capsular release was performed on 167 patients (173 shoulders) with adhesive shoulder capsulitis. The CMS significantly increased.

Warner et al., [31] studied 23 patients with idiopathic adhesive capsulitis that had failed to respond to physical therapy or closed manipulation. All patients had an anteroinferior release combined with an MUA; six also had subacromial decompression. They had inpatient physiotherapy for 48 h under interscalene local anaesthetic blockade. The mean improvement in the constant score was 48 points (13-77) with a significant improvement in the range of movement.

With regard to patients' satisfaction, the present study showed that 90% of patients in arthroscopic group and 76.7% of the patients in MUA group were satisfied.

In line with these findings, Segmüller et al., [32] described arthroscopic release of the inferior

and middle glenohumeral ligament with a follow-up of 13.5 months in 26 shoulders; 88% were satisfied and 76% had normal function. They concluded that the arthroscopic release is safe and effective in treating adhesive capsulitis.

Massoud et al., [33] reviewed the management of a subgroup of diabetic patients, 43 of the patients who had diabetes (47 shoulders) were included in the study. The outcome was satisfactory in 86.7% in patients with non-insulin-dependent diabetes and 81% in patients with insulin-dependent diabetes.

In terms of comparative evaluation, we found that the ROM in abduction, external rotation, and internal rotation was significantly better in arthroscopy group than MUA group. In addition, the CMS was significantly better in arthroscopy group than MUA group. No significant differences were noted between both techniques in terms of postoperative pain and satisfactions.

However, the published literature seems inconsistent regarding the superiority of one technique over the other. Ogilvie-Harris et al., [34] compared MUA with arthroscopic release in a prospective study of 40 patients. After a follow-up between 2 and 5 years, the results showed a similar ROM; nevertheless, the arthroscopic release had a better outcome in terms of pain and function. The overall outcome was excellent in 15 of 20 patients in the arthroscopic group, but only in 7 of 18 patients in the MUA group.

Massoud et al., [33] also compared MUA only (24 shoulders), a MUA followed by an arthroscopy (12 shoulders), or an arthroscopic release (11 shoulders) for a frozen shoulder. Most of patients obtained their maximum relief of pain and functional recovery within 3 months of surgery, with no significant differences between groups.

Grant and colleagues [35] performed a systematic review to compare MUA alone with arthroscopic capsular release for the treatment of recalcitrant idiopathic or secondary-systemic adhesive capsulitis of the shoulder. MEDLINE, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL) and Cochrane Database of Systematic Reviews were searched up to November 2011. The review concluded that there was no clear difference between MUA versus arthroscopic capsular release in idiopathic or secondary-systemic adhesive capsulitis of the shoulder.

Opponents of MUA argue that it cannot be seen or felt what other structures than the joint capsule

are damaged during manipulation. In addition, serious complications of MUA have been reported, such as a humeral shaft fracture, glenoid rim fracture, shoulder dislocation, brachial plexus traction injury or intra-articular damage to the cartilage or rotator cuff [36].

We acknowledge that the present study has some limitations. The study was a single-center experience and therefore the results cannot be generalized to the general population. In addition, the sample size was relatively small which in another limitation for the generalizability of our findings. We recommend further studies to confirm our findings and to identify patient criteria before proceeding to MUA or arthroscopic capsular release.

#### Conclusion:

In conclusion, both arthroscopic capsular release and MAU are effective modalities for management of adhesive capsulitis. The increase in ROM and Constant score, reduction in pain and around 85% of satisfaction are possible with MUA and arthroscopic capsular release for frozen shoulder patients. The present study also shows that arthroscopic capsular release leads to better improvement in the ROM than MUA. A low overall complication rate was observed in both groups. Nevertheless, further studies are still needed to confirm our findings and to identify patient criteria before proceeding to MUA or arthroscopic capsular release.

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## مقارنة ما بين استخدام تحريك مفصل الكتف وإستخدام المنظار الجراحي لفك التصاقات تيبس مفصل الكتف الأولى

المقدمة : تم وصف تيبس مفصل الكتف عن طريق دوبلاي عام ١٨٧٢م في حين كان كود مان أول من قام باستعمال هذا المصطلح. يصيب تيبس مفصل الكتف النساء عادة ما بين عمر ٤٠-٦٠ عاماً وغالباً ما يعانون من اضطرابات في وظائف الغدة الدرقية أو مرض السكر بالدم. على الرغم من أن هذا المرض يستمر من عام إلى عامين يعاني المريض خلالها من ألم شديدة بمفصل الكتف وخصوصاً ليلاً مع تيبس في مجال الحركة مما يعيقه عن الحركة. ومن ثم ظهرت الحاجة إلى التدخل ما بين العلاج الدوائي والعلاج الطبيعي أو استخدام حقن الكورتيزون مع أو بدون اللجوء إلى تحريك المفصل المتيبس تحت مخدر عام. وتطور التدخل الجراحي حتى وصل إلى فك وتحريك الإلتصاقات عن طريق استخدام المنظار الجراحي لمفصل الكتف.

الأهداف : الهدف من هذه الرسالة هو المقارنة ما بين فك الإلتصاقات لتيبس مفصل الكتف الأولى عن طريق التحريك تحت مخدر عام واستخدام المنظار الجراحي.

الطرق : هذه الدراسة دراسة وصفية مستقبلية سوف تشمل ٦٠ مريضاً مصابون بتيبس الكتف الأولى مقسمون إلى مجموعتين وسوف تتم الدراسة اعتباراً من يناير ٢٠١٤ وسوف يتم دراسة نتائج هذه الدراسة ومقارنتها بالدراسات المماثلة.

النتائج : لا يوجد فرق كبير أو ارتباط فيما يتعلق بالمضاعفات بين المجموعات، حدث الرضا بشكل ملحوظ فيما يتعلق بانخفاض السكر التراكمي في كلا المجموعتين.

الخلاصة : استخدام تحريك مفصل الكتف واستخدام المنظار الجراحي طريقتان فعالتان لفك التصاقات تيبس مفصل الكتف الأولى. ومع ذلك، فإن استخدام المنظار الجراحي يؤدي إلى تحسن أفضل في نطاق الحركة عن استخدام تحريك مفصل الكتف كما لوحظ معدل مضاعفات عام منخفض في كلا المجموعتين.