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Effectiveness of shoulder end-range mobilization and scapular gliding techniques in post-operative stiffness after arthroscopic slap and Bankart repair: A case study

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Abstract

Background: Post-operative stiffness is known common complication after arthroscopic SLAP and Bankart repair and it is believed to result from an intra-articular inflammatory process that causes discomfort, stiffness, and loss of shoulder mobility due to scar tissue formation in the joint capsule.

Methods: 35-year-old man with adhesive capsulitis was treated using two physical therapy techniques: shoulder end-range mobilization and scapular mobilization. Patient received treatment six times a week for four weeks. The effectiveness of the treatment was measured Numeric Pain Rating Scale, Shoulder Pain and Disability Index, and shoulder range of motion measured with a goniometer.

Results: After the treatment, the patient experienced a significant decrease in pain and a notable improvement in shoulder movement. The shoulder function also improved considerably, leading to less disability.

Conclusion: Shoulder end-range mobilization and scapular mobilization are effective treatments for reducing pain and improving movement and function in people with Post-operative Stiffness after arthroscopic SLAP and Bankart repair. These techniques can be valuable components of a rehabilitation program for Post-operative Stiffness after arthroscopic SLAP and Bankart repair.

Keywords: Post-operative stiffness, SLAP and Bankart repair, end range mobilization, scapular mobilization, goniometer, physical therapy

Introduction

Post-operative shoulder stiffness typically involves pain and a gradual reduction in range of motion in all planes, which can be attributed to adhesion and capsular contracture. Following post operative of the shoulder the majority of the patient develops stiffness of the shoulder this is known as secondary adhesive capsulitis. Shoulder stiffness occurred in 11% to 35% of cases. 48% in the acute period, which occurs within months following surgery ^[1].

The pathophysiology of shoulder stiffness after SLAP repair is primarily due to two interconnected factors that is post-surgical adhesions and capsular contracture. This results in a less flexible and mechanically constrained shoulder joint. Adhesions can cause physical restrictions by binding tissues together, while capsular contracture leads to more generalized loss of joint motion due to the capsule tightness and thickening. Additionally, there may be a modified movement pattern to protect the painful tissues. This would alter the shoulder's motor control, limiting its range of motion and causing the joint to gradually stiffens ^[2].

Management strategies for Post-operative Stiffness after arthroscopic SLAP and Bankart repair are multifaceted with physiotherapy playing a critical role. Two commonly employed techniques are shoulder end-range mobilization and scapular mobilization. Shoulder end-range mobilization involves specific passive movements to improve joint capsule extensibility and restore range of motion. Scapular mobilization focuses on enhancing the mobility of the scapula to facilitate more efficient shoulder mechanics and reduce compensatory strain ^[3].

Patient information

A 35-year-old man presented with excruciating pain and stiffness in his left shoulder lasting for six weeks, significantly impeding daily activities. The onset of symptoms followed a road

traffic accident resulting in a left shoulder injury. MRI findings revealed a Superior Labrum Anterior and Posterior (SLAP) lesion and a Bankart lesion. The patient underwent arthroscopic repair for both the SLAP and Bankart injuries. Following eight weeks of immobilization in an arm sling, the patient reported exacerbated pain and stiffness, severely limiting left shoulder movements. Upon referral by his surgeon, the patient commenced physical therapy.

Clinical findings

Upon examination, the patient exhibited considerable pain and tenderness, classified as grade 2. Range of motion (ROM) in the left shoulder was significantly restricted: forward elevation was 50°, abduction was 25°, and external rotation was 5°. Additionally, resisted isometric testing revealed weakness and pain in the shoulder flexors, abductors, internal rotators, and external rotators. Standardized physiotherapy evaluations, including Apley's scratch test and the shoulder shrug test, were positive, with pain and incomplete movement observed. Adhesive capsulitis was diagnosed based on the patient's history, physical examination, and imaging studies. Pre-treatment scores were recorded as 69/130 (53.07%) on the Shoulder Pain and Disability Index (SPADI) and 9/10 on the Numerical Pain Rating Scale (NPRS).

Methods

Informed consent was obtained from the patient before initiating therapy. The treatment protocol consisted of one-hour sessions, six days per week, over a period of four weeks. The initial evaluation included demographic data, a brief history of the present illness, and a comprehensive physical

examination. The patient was instructed for exercises and received interventions including shoulder end-range mobilization and scapular mobilization. Specific techniques included glenohumeral joint distractions, anterior, posterior, and inferior glides, along with scapular mobilizations. Cryotherapy was given for 15 minutes followed with gentle capsular stretches (i.e., Inferior capsular stretch, Posterior capsular stretch) each capsular stretch was given for 30 sec, strengthening exercise for rotator cuff muscles and scapular muscles with the TheraBand and free weights for 2 sets with 10 repetitions. Pre- and post-treatment outcomes were assessed using the Numerical Pain Rating Scale (NPRS) and the Shoulder Pain and Disability Index (SPADI), with range of motion documented before and after the intervention.

Result

Table 1: Pre-post comparison of ROM

SL.NO:1	Pre-treatment range		Post-treatment range	
	AROM	PROM	AROM	PROM
Flexion	0-50°	0-55°	0-170°	0-175°
Extension	0-30°	0-40°	0-55°	0-60°
Abduction	0-25°	0-30°	0-160°	0-170°
External rotation	0-5°	0-8°	0-60°	0-70°
Internal rotation	0-55°	0-60°	0-70°	0-70°

Impression: The shoulder flexion, extension, abduction and external rotation movements all demonstrated improved range of motion in the pre- post comparison.

Table 2: Pre-post comparison of NPRS and SPADI Scale

Outcome measures	Pre-Treatment	Post-Treatment
Numerical Pain Rating Scale (NPRS)	9	3
Shoulder Pain and Disability Index (SPADI)	Very severe	Mild

Impression

A pre- post comparison of the NPRS Scale indicated a reduction in severe shoulder pain to mild pain, while the SPADI scale revealed an improvement from very severe shoulder pain and disability to mild shoulder pain and disability.

Discussion

The results of this case study underscore the effectiveness of combining shoulder end-range mobilization and scapular mobilization techniques in the management of Post-operative Stiffness after arthroscopic SLAP and Bankart repair. Improvements observed in both pain levels and functional outcomes suggest that these techniques play a critical role in the rehabilitation process for patients with this condition^[4].

The substantial reduction in Numerical Pain Rating Scale (NPRS) scores from 9 pre-treatment to 3 post-treatment indicates a significant alleviation of pain. This reduction can be attributed to the mobilization techniques employed, which likely stimulated mechanoreceptors and facilitated pain modulation. Similarly, the Shoulder Pain and Disability Index (SPADI) score decreased markedly from 69 to 20, reflecting improved shoulder function and reduced disability.

The observed improvements in shoulder range of motion and pain relief are consistent with the physiological effects of the mobilization techniques used. Shoulder end-range mobilization enhances joint capsule extensibility and helps stretch tightened soft tissues. This process can facilitate the

rearrangement and remodeling of connective tissues, leading to increased joint mobility^[5]. The techniques likely induced rheological changes in the synovium, such as decreased viscosity, improved lubrication, and better nutrient distribution, which contribute to reduced adhesions and enhanced joint function^[6].

Scapular mobilization, on the other hand, targets the release of adhesions in the scapulothoracic muscles, improving scapular mobility and, consequently, shoulder function. By addressing the associated musculature, scapular mobilization can reduce compensatory strain and contribute to overall shoulder health^[9].

The findings of this study emphasize the importance of integrating both shoulder end-range and scapular mobilization techniques into the rehabilitation protocol for. The combination of Post-operative Stiffness after arthroscopic SLAP and Bankart repair these methods appears to be effective in reducing pain and improving functional outcomes, supporting their inclusion in comprehensive physiotherapy programs^[10].

While this case study demonstrates promising results, further research with larger sample sizes and control groups is necessary to validate these findings and establish generalizability. Additionally, exploring the long-term effects of these interventions and their impact on quality of life could provide further insights into their efficacy and optimization in clinical practice^[11].

Conclusion

Shoulder end-range and scapular mobilization, combined with cryotherapy, gentle stretching, and strengthening exercises, effectively reduces pain and improves function in Post-operative Stiffness after arthroscopic SLAP and Bankart repair. This approach enhances joint mobility and muscle function, leading to significant pain relief and better functional outcomes for patients

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