

Effect of Scapular Stabilization Exercises in Post Traumatic Shoulder Pain

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Abstract:

Background: Shoulder pain is a common condition seen in many individuals. It can affect daily tasks like lifting, reaching, clothing and overhead movement. The shoulder joint is one of the most mobile joints in the human body.

Case presentation: Post traumatic shoulder pain commonly presents with pain around the shoulder region after injury. The pain may increase with movement and reduce at rest.

Intervention: The patient completed 2 weak physiotherapy programme including scapular stabilization, scapular setting or Wall Push up plus exercise to improve functional ability, increase Range of motion and shoulder stability.

Result: After undergoing 2 weeks of physiotherapy treatment consisting of scapular stabilization exercises including scapular setting and wall push-up plus, the patient showed significant improvement

Conclusion: This study concludes that the use of scapular stabilization exercises such as scapular setting and wall push-up plus is an effective physiotherapy intervention for post traumatic shoulder pain.

Keywords: Post Traumatic Shoulder Pain; Scapular Stabilization; Physiotherapy; Exercise Therapy; Pain Reduction; ROM; Functional Mobility; Muscle Strengthening; Proprioception

BACKGROUND:

Shoulder pain is a common condition seen in many individuals. It can affect daily tasks like lifting, reaching, clothing and overhead movement. The shoulder joint is one of the most mobile joints in the human body. The shoulder joint is less stable and more prone to damage as a result of its tremendous mobility. Trauma, excessive use, bad posture, or weak muscles can cause shoulder pain. Post traumatic shoulder pain is commonly seen after falls, accidents or sports injuries. It may cause pain, swelling, stiffness, discomfort and difficulty in movement. The shoulder joint works properly when all its parts move in co-ordination. The scapula plays an important role by providing stability and proper alignment during arm movements. Inadequate shoulder mechanics and greater strain on muscles and joints can result from disrupted scapular mobility.

Definition: Shoulder pain is defined as pain or discomfort felt in the shoulder region. It may develop due to problems in muscles, joints or surrounding soft tissues. The condition is often associated with reduced range of motion making it difficult to move the arm freely. In many cases, individuals also experience weakness and stiffness in the shoulder. These symptoms can interfere with daily activities such as lifting, reaching and dressing. If not managed properly shoulder pain can lead to functional limitations and reduced quality of life.

Epidemiology: Shoulder pain is a common musculoskeletal problem seen in general population. Studies

show that nearly half of the individuals may experience shoulder pain at some point. The one-month prevalence has been reported to range between approximately 20% to 50% depending on the method of assessment. However, when stricter criteria such as associated disability are considered, the prevalence decreases to around 20%. Shoulder pain can affect people of different age groups, but it is more commonly seen in middle-aged and older individuals. Due to its high prevalence, it is considered a significant cause of discomfort and functional limitation.

Prevalence: Shoulder pain is a common condition with a prevalence ranging from approximately 4% to 26% in the general population. It is frequently seen in clinical practice, especially in adults above 40 years of age. The cause of shoulder pain are varied and may arise from different structures such as the neck, glenohumeral joint, acromioclavicular joint, rotator cuff and surrounding soft tissues. Among these rotator cuff disorders are considered the most common cause, accounting for more than 2/3rd of the cases.

Anatomy: The shoulder joint is the most mobile joint of the human body and allows a wide range of movements. It is formed by the head of the humerus and the glenoid cavity of the scapula. The stability of this joint is maintained by muscles, ligaments, and a joint capsule. The rotator cuff muscles, namely supraspinatus, infraspinatus, teres minor and subscapularis help in supporting and stabilizing the joint. A bursa is present around the joint which reduces friction during movement. Ligaments provide strength and prevent excessive motion. All these structures work together for proper functioning of the shoulder. Injury or inflammation in any of these structures may result in shoulder pain and restriction of movement.

Etiology: Post-traumatic shoulder pain occurs as a result of direct or indirect injury to the shoulder joint. It could appear after a sharp impact on the shoulder, a fall or a car accident. Soft structures like muscles, ligaments, and tendons - particularly the rotator cuff - can be harmed by trauma. Associated problems such as dislocation, fracture or ligament sprain may occur in certain instances. Pain and limited movement following an accident are also caused by inflammation and swelling. The severity of symptoms depends on the extent of tissue damage.

Biomechanics: The shoulder joint is highly mobile joint that allows a wide range of movements: flexion, extension, abduction, adduction, and rotation are some of these motions. To create smooth motion, the glenohumeral joint collaborate with the scapula. Scapulohumeral rhythm is the term for this synchronized movement. The scapula is crucial for preserving alignment and stability. Joint mobility is controlled by muscle such as the scapular stabilizers and rotator cuff. The humeral head is kept in the center of the glenoid cavity by these muscles. This normal co-ordination may get disturbed. This leads to altered movement patterns, weakness and pain. Scapular stabilization exercises help in restoring normal biomechanics and function.

Clinical manifestation: Post traumatic shoulder pain commonly presents with pain around the shoulder region after injury. The pain may increase with movement and reduce at rest. The shoulder joint's range of motion frequently decreases. When lifting or moving their arms, patients may feel feeble. There may be soreness and swelling in the vicinity of the afflicted area. Muscle spasms can also happen under certain situations. Everyday tasks like dressing or combing hair can be challenging. When moving, you can feel unsteady or uncomfortable. Altered scapular movement can also be observed. The severity of symptoms depends on the extent of trauma.

Investigation: To confirm the diagnosis and rule out underlying conditions, various investigations are performed. Clinical examination is important to assess pain, range of motion and functional limitation.

- X-ray is done to rule out fracture, dislocation and bony changes
- MRI helps in assessing soft tissue injuries such as rotator cuff tear and ligament damage.

- Ultrasonography can be used as a cost effective method to evaluate tendons and muscles
- Special tests and range of motion assessment are also carried out.
- Treatment:- Scapular setting involves gently drawing the shoulder blades downward and inward (retraction and depression) with slow, controlled movement, holding for 5–10 seconds to activate trapezius and rhomboids and improve posture. Wall push-up plus is performed by standing facing a wall, doing a push-up followed by an extra forward push, which activates the serratus anterior and enhances scapular stability. Both exercises are performed in 10–15 repetitions, 2–3 sets, 2–3 times daily.

Scope of the study: This study focuses on evaluating the effectiveness of scapular stabilization exercises in patients with post-traumatic shoulder pain. It mainly includes exercise like scapular setting and wall push-up plus to improve scapular control and muscle strength. The study is limited to assessing its effects on pain, shoulder range of motion, stability and functional activities. It also helps in understanding the role of proper muscle activation in recovery and improving daily activities of the patient.

Objectives of the study

- To evaluate the effect of scapular stabilization exercises on shoulder pain
- To assess the improvement in scapular stability
- To evaluate the increase in shoulder range of motion.
- To assess the improvement in muscle strength around the shoulder joint.
- To evaluate the improvement in functional activities after treatment.

Case Description: A 49-year old patient came with complaint of pain in the right shoulder since 2 days after a traumatic incident. The pain started suddenly and was mainly present over the right shoulder area. The patient rated the pain as 7/10 on VAS or NPRS. There was no previous history of shoulder pain, surgery or any neurological problem. The pain increased during shoulder movements like lifting the arm, overhead activities and reaching, while it reduced slightly on taking rest. The patient also had difficulty in doing daily activities such as combing hair, dressing and lifting objects. On observation, mild swelling was seen over the right shoulder. The patient was keeping the arm close to the body due to pain. No visible deformity or skin discolouration was noted. On palpation, tenderness was present over the anterior and lateral part of the right shoulder. Muscle tightness was also felt around the upper trapezius and surrounding muscles. Slight increase in local temperature was noted. Range of motion (ROM) of the shoulder was checked using a goniometer in sitting position. Active movements like flexion, abduction and external rotation were painful and restricted. Passive movements were also limited but pain was comparatively less. Pain was more at the end range of movements. On further assessment, scapular movement was not proper and there was reduced stability during shoulder motion. Weakness of scapular stabilizing muscles was suspected. No symptoms like numbness, tingling or radiating pain were reported during examination. Based on the findings, the patient was diagnosed with post-traumatic right shoulder pain, with involvement of scapular instability.

Uniqueness of the study: This study is unique as it focuses on scapular stabilization exercises in post-traumatic shoulder pain. It highlights the role of scapular muscles like serratus anterior and trapezius in improving shoulder stability. It also assesses changes in pain, range of motion and functional activities. This approach is different as it targets scapular movement along with treatment. The findings may help in providing an effective and simple physiotherapy management for patients with shoulder pain.

Intervention:-

Scapular Setting Exercises: The patient was instructed to perform scapular setting exercise for improving scapular stability, correcting posture and enhancing muscle control around the shoulder girdle. This exercise was included as a basic activation exercise to prepare the patient for further strengthening. The exercise was performed daily as a part of physiotherapy intervention. **patient position-** The patient is in standing position with the back straight and well supported. Both upper limbs are relaxed by the side, and shoulders are kept in a neutral position. **Therapist position-** The therapist stood behind the patient, maintaining a comfortable working posture while observing scapular movements. **Procedure :-** The therapist instructed the patient to gently draw the shoulder blades backward and downward (retraction and depression) without elevating the shoulders or causing neck strain. The contraction was held for 5-10 seconds followed by relaxation. The exercise was repeated 10-15 times and performed in 2-3 sets according to patient tolerance. Proper breathing was encouraged during the exercise to avoid compensation.

Wall push-up plus Exercise :- The patient performed wall push-up plus exercise to improve activation of the serratus anterior muscle and to enhance scapular stability and control. This exercise was included as a strengthening and dynamic stabilization exercise for the shoulder joint. The exercise was performed regularly as a part of rehabilitation program. **Patient position :-** The patient stood facing the wall with feet slightly apart and hands placed on the wall at shoulder level. **Therapist position :-** The therapist stood beside the patient to observe movement pattern and provide necessary correction. **Procedure :-** The patient performed a wall push-up by bending the elbows and bringing the body closer to the wall, followed by pushing back to the starting position. An additional forward push (protraction phase) was then performed to activate the serratus anterior muscle. Each repetition was held for 2-3 seconds and then relaxed. The exercise was performed for 10-15 repetitions 2 sets daily depending on patient tolerance. Movements were kept slow and controlled to ensure proper muscle activation and to avoid Compensatory movements.



Result:

After undergoing 2 weeks of physiotherapy treatment consisting of scapular stabilization exercises including scapular setting and wall push-up plus, the patient showed significant improvement. Shoulder pain was reduced with the VAS score decreasing from 7/10 to 3/10 and NPRS score also reduced from 7/10 to 3/10. Scapular stability and muscle control were improved with reduction in muscle tightness around the shoulder region. Shoulder range of motion improved in flexion, abduction, internal rotation and external rotation with less pain at the end range of movement. The patient was able to perform daily activities such as lifting, reaching and overhead activities with less discomfort. Postural awareness also improved, and the patient was able to maintain better shoulder alignment during functional activities. Overall, the combined effect of scapular stabilization exercises resulted in reduced pain, improved shoulder mobility, better stability and improved functional activity.

Outcome measures	Pre treatment	Post treatment
VAS pain score	7/10	3/10

NPRS score

7/10

3/10

Discussion

In patients with post-traumatic shoulder pain, scapular stabilization exercises have been shown to reduce pain, increase range of motion and improve functional ability. Numerous studies have been conducted to support the effectiveness of scapular stabilization in shoulder rehabilitation. In 2022, Alan J. Howell et al. conducted a randomized clinical trial on patients with shoulder dysfunction. They found that scapular stabilization exercises improved range of motion and showed better outcomes compared to non-stabilization exercises. In 2025, AElder et al. also reported that scapular stabilization plays an important role in improving shoulder function, although it should be combined with other rehabilitation approaches for better results. Another recent study (2026) demonstrated that scapular stabilization exercise significantly reduce pain and improve functional activity in patients with shoulder pain. Numerous studies have demonstrated the effectiveness of scapular stabilization in the management of shoulder conditions. Our study also showed improvement in pain, range of motion and functional ability after treatment. Scapular stabilization is effective in improving shoulder joint stability and movement. The physiological mechanism behind this improvement is related to better muscle activation and co-ordination of scapular muscles, which helps in increasing ROM and reducing pain.

Conclusion:

This study concludes that the use of scapular stabilization exercises such as scapular setting and wall push-up plus is an effective physiotherapy intervention for post traumatic shoulder pain. After 2 weeks of treatment, the patient showed reduced shoulder pain, improved scapular stability, increased shoulder range of motion, better muscle control and improved functional ability. The patient was educated on proper posture, activity modification and regular home exercises which may help in maintaining these improvements and preventing recurrence of symptoms. Overall, scapular setting and wall push-up plus are safe, practical and effective conservative approaches for improving shoulder function and quality of life in individuals with post-traumatic shoulder pain.

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