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Case Report

Post-operative rehabilitation following posterior superior labral repair to improve shoulder function in a manual labourer: a case study

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ABSTRACT

This case study presents the post-operative physiotherapy rehabilitation of a 28-year-old male bike mechanic following arthroscopic repair of a type III superior labrum anterior to posterior (SLAP) lesion in the right shoulder. The rehabilitation program focused on restoring shoulder mobility, strength, and functional stability through a structured, phase-wise physiotherapy approach including passive and active-assisted range of motion exercises, neuromuscular stimulation, scapular stabilization, proprioceptive neuromuscular facilitation, and progressive strengthening. Over an eight-week period, the patient demonstrated significant improvements in pain, range of motion, and muscular strength, with the disabilities of the arm, shoulder and hand (DASH) score improving from 82% to 14%, the University of California, Los Angeles (UCLA) shoulder rating scale from 14/35 to 31/35, and pain on the numerical pain rating scale (NPRS) reducing from 9/10 to 2/10. The patient achieved full return to work without restrictions. This case highlights the importance of early, structured, and individualized physiotherapy intervention in optimizing post-surgical outcomes and restoring functional independence following superior labral repair.

Keywords: SLAP, Shoulder injury, Rotator cuff, Exercise, Strengthening

INTRODUCTION

The shoulder is a complex and highly mobile joint that relies on a balance of static and dynamic stabilizers to maintain functional integrity during every day activities and specialized tasks. Among these stabilizers, the glenoid labrum plays a crucial role by deepening the shallow glenoid cavity and providing attachment for the long head of the Bicep's tendon. Injuries to the superior portion of the labrum, known as SLAP lesions, can lead to significant pain, instability, and functional limitations. [1,2]

SLAP lesions are caused by both acute and chronic mechanisms. Acute trauma, such as a fall on an outstretched hand, sudden pulling or lifting, or direct impact, can result in labral tears. Chronic repetitive stress, often seen in individuals performing frequent overhead motions or load-bearing tasks, may also contribute to degenerative changes and eventual labral injury.[3,4] Although commonly associated with athletes, SLAP lesions are increasingly seen in the general population, particularly among those involved in physically demanding occupations or active lifestyles.[5,6]

Clinically, patients with SLAP lesions may present with deep shoulder pain, mechanical symptoms such as clicking, popping, or locking, and reduced strength or endurance in overhead movements. These symptoms often overlap with other shoulder conditions, making diagnosis challenging. A detailed history, thorough physical examination, and imaging studies-especially magnetic resonance arthrography-are typically required for accurate identification of the lesion.[7,8]

The treatment of SLAP lesions varies depending on the severity of the injury, patient's age, functional demands,

and chronicity of symptoms. Conservative physiotherapy is often first line of management, particularly in less severe or early cases.[9,10] When symptoms persist despite conservative care, surgical intervention such as arthroscopic SLAP repair may be necessary to restore structural integrity and shoulder stability.[4,11]

Physiotherapy plays a central role in both pre-operative and post-operative management. Preoperative rehabilitation aims to control pain and inflammation, preserve or restore range of motion, and improve muscular strength and neuromuscular control.[12] Preparing the shoulder through targeted prehab may also contribute to better surgical outcomes and faster recovery.[13,15]

Post-operatively, a structured and progressive rehabilitation program is essential for protecting surgical repair, restoring functional mobility, and gradually reintroducing strength, endurance, and task-specific activity. The rehabilitation process typically progresses through several phases: early protection and passive movement, gradual reintroduction of active motion, strengthening of the rotator cuff and scapular stabilizers, and functional retraining based on the individual's goals.[16]

This case study details the physiotherapy management of a patient diagnosed with a SLAP lesion, focusing on post-operative rehabilitation. It highlights the clinical reasoning behind each phase of treatment, the progression of exercises, and the patient's functional outcomes. The report also underscores the importance of evidence-based protocols and individualized care plans in optimizing recovery and restoring shoulder function.

CASE REPORT

The patient provided written informed consent to participate in this case study. A 28-year-old right-hand dominant male, employed as a professional bike mechanic, presented to the outpatient physiotherapy department with complaints of right shoulder pain, reduced overhead activity, and difficulty lifting objects. The symptoms developed following a work-related incident in which he experienced a sudden, forceful strain while lifting heavy motorcycle component approximately five weeks prior. The pain was described as dull and constant at rest, increasing in intensity during activity, particularly overhead movements and reaching tasks.

On the NPRS, the patient rated the pain as 5/10 at rest and 9/10 during activity. There were no signs of sensory or motor neurological deficits. Magnetic resonance imaging (MRI) of the right shoulder revealed a type III SLAP lesion. Based on the clinical findings and imaging, he underwent arthroscopic SLAP repair surgery on 7th February 2025.

Post-operatively, the patient's shoulder was immobilized in an arm sling for four weeks, following which he was referred for physiotherapy to address pain, stiffness, and functional limitations. Physiotherapy was initiated at the end of the immobilization period and was carried out in a hospital-based setting. The rehabilitation plan consisted of daily sessions lasting up to three hours, focusing on progressive restoration of shoulder function.

The patient expressed concerns regarding his ability to return to work, compromised independence in daily tasks, and difficulty sleeping on the affected side. His occupational responsibilities involved frequent overhead mechanical tasks, handling tools, and lifting. Therefore, the primary goals of physiotherapy were to relieve pain, restore full active range of motion, strengthen the scapular muscles, and facilitate a safe and complete return to work.

Examination-test measures

At the patient's initial physiotherapy visit, a comprehensive musculoskeletal examination was conducted. The left upper limb was used as a baseline reference to assess the strength, range of motion, joint mobility, and muscle tone of the affected right shoulder. The evaluation incorporated both subjective and objective measures, along with palpation and functional assessment.

The UCLA shoulder rating scale was used to assess shoulder function in terms of pain, function, active forward flexion, strength of forward flexion, and patient satisfaction. The patient scored 14/35 at baseline, indicating significant functional impairment. The DASH score was 82%, reflecting severe upper limb disability and limitation in activities of daily living and work-related tasks. The NPRS was used to assess pain severity. The patient reported pain levels of 9/10 during activity and 5/10 at rest, consistent with post-surgical inflammatory changes and muscle guarding.

A standard 12-inch goniometer was used to assess both active and passive range of motion (AROM and PROM) in accordance with Norkin and White's guidelines. Marked restrictions were noted in shoulder flexion, abduction, and external rotation. Internal rotation was functionally limited to the level of the buttocks. These values are summarized in Table 1.

Manual muscle testing (MMT) was performed for the rotator cuff (supraspinatus, infraspinatus, subscapularis, teres minor), deltoid, trapezius, and serratus anterior using Kendall's grading scale (0-5). Muscle weakness was evident in all tested groups, particularly in the supraspinatus and infraspinatus, scoring 2/5 on the right side at baseline. Scapular stabilizer weakness was also prominent.

Palpation revealed tenderness over the anterolateral shoulder and reduced scapular control during elevation. Postural observation noted mild anterior shoulder protraction and altered scapulohumeral rhythm. Light touch sensation was intact over upper limb dermatomes.

A measuring tape used to assess circumference of deltoid region and proximal arm girth, which showed slight asymmetry, with mild post-op swelling in right upper limb. There was no visible ecchymosis or scar infection.

Functional assessment included observation of overhead reach, cross-body movements, reaching behind the back, and object lifting. The patient demonstrated pain-limited ROM and compensatory trunk movements during these tasks. The shoulder demonstrated hypomobility in glenohumeral joint play, particularly in posterior and inferior glide. Joint mobilization tests indicated capsular tightness with pain reproduction in end-range abduction and external rotation. Overall, the assessment indicated that the patient's shoulder pain and functional impairment were significantly affecting quality of life and necessitated focused therapeutic intervention (Table 1).

Clinical impression evaluation, diagnosis, prognosis

The patient was advised to undergo structured and progressive physiotherapy following confirmation of the clinical impression based on detailed evaluation findings. The patient exhibited marked deficits in active and passive range of motion, muscular strength, scapular control, and neuromuscular coordination of the right upper limb. These impairments affected tolerance for functional activities, especially overhead reaching, tool handling, and activities of daily living such as grooming, dressing, and reaching shelves. Table 1: Prognosis/Improvement in outcome measures highlights the patient's progressive recovery in pain, mobility, and strength. Despite anatomical and functional restrictions post-surgery, the patient remained an appropriate candidate for this rehabilitation-based case study and was fully independent in self-care, transfers, and basic domestic tasks. The medical diagnosis was a type III SLAP lesion (right shoulder), surgically managed with arthroscopic SLAP repair, and the physiotherapy diagnosis was defined as functional limitation due to impaired shoulder ROM, scapular dyskinesis, and rotator cuff weakness. Given the patient's active lifestyle, job demands, high motivation, and family support, the prognosis was considered excellent. A daily activity log and patient-reported outcomes were recorded at each session, and weekly progress reports included updated measures of NPRS, UCLA score, DASH score, shoulder ROM, and manual muscle strength. The patient attended physiotherapy 6 days a week for 8 weeks, with each session lasting approximately 3 hours. Therapeutic goals focused on activating the rotator cuff and scapular stabilizers, restoring joint range, reducing inflammation, and gradually loading the shoulder joint for full return to occupation. The right upper extremity was rehabilitated using a combination of manual mobilizations, neuromuscular stimulation, functional proprioceptive training, and progressive resistance exercises, aimed at regaining upper limb endurance, joint mobility, and independence in ADLs and work-related activities. A comprehensive list of both short-term and long-term goals is provided in Table 2.

Procedure/ intervention

The patient received physiotherapy treatment following a four-week period of post-operative immobilization, with sessions conducted in a hospital setting for approximately three hours per day, six days a week, over a period of eight weeks. Each session began with a brief evaluation of the patient's symptom response to the previous day's therapy and progress in pain, mobility, and function. Initial treatment focused on passive mobility, beginning with passive range of motion (PROM) exercises and passive abduction with the scapula stabilized on a treatment couch. These were followed by passive shoulder flexion with the elbow maintained at 90° flexion and internal rotation, as well as 90° shoulder flexion combined with inward and outward movement to promote controlled scapulohumeral motion. PNF (proprioceptive neuromuscular facilitation) patterns were introduced early to facilitate dynamic neuromuscular activation.

As mobility improved, the patient progressed to side-lying exercises, including horizontal abduction and external rotation using weights, to target the posterior shoulder complex. In prone position, exercises included shoulder extension and horizontal abduction, gradually improving posterior chain activation. To initiate closed-chain strengthening, wall push-ups were introduced, followed by perturbation training in a quadruped position, which enhanced proprioceptive feedback and scapular control. In the sitting position, patient performed 90° shoulder flexion holds using 1 kg weight, followed by full 180° flexion and rotational movements, shoulder abduction with weight, and resisted band-assisted scapular retraction exercises to build muscular endurance and postural control.

In the standing position, exercises such as wall push-ups and wall slides using a pillow were employed to reduce joint stress while improving vertical shoulder control. Neuromuscular electrical stimulation (NMES) was applied to the supraspinatus and infraspinatus, starting with Faradic current from week 3 and progressing to Russian current from week 6 to enhance muscle recruitment and bulk (Table 3). To minimize post-exercise discomfort and inflammation, cold pack therapy was administered for 15 minutes over the anterior and lateral shoulder at the end of each session. The program was customized to meet the patient's evolving tolerance and function, with gradual integration of work-related tasks and posture correction strategies to ensure a safe return to occupation.

Outcomes

Throughout the eight-week rehabilitation program, the patient demonstrated marked improvements in shoulder range of motion, rotator cuff strength, scapular stability, and upper limb function. These improvements were evident in both objective measurements and standardized functional outcome scores.

Active shoulder flexion improved from 90° to 170°, abduction from 80° to 165°, and external rotation from 30° to 80°. Functional internal rotation, which was initially limited to the buttock level, progressed to the T7 spinal level. Strength testing using the Kendall scale showed significant gains across all major shoulder and scapular stabilizing muscles. The supraspinatus and infraspinatus improved from 2/5 to 4+/5, and the trapezius and serratus anterior improved from 3/5 to 5/5.

The patient's NPRS scores reduced from 5/10 to 0/10 at rest and from 9/10 to 2/10 during activity, reflecting a substantial decrease in pain. DASH score improved from 82% to 14%, indicating near-complete restoration of upper limb function. Similarly, UCLA Shoulder Score increased from 14/35 to 31/35, reflecting the patient's satisfaction with pain relief, strength, and functional capability.

All short-term goals were successfully met within first 4 weeks, and the patient partially exceeded long-term targets by week 8 (Table 2). He returned to full occupational duties as a bike mechanic without restriction or discomfort. Structured rehabilitation program significantly enhanced his quality of life and daily performance.

Table 1: Prognosis/improvement in the scores of outcome measures.

Outcome measures	Baseline	After 4 weeks	After 8 weeks
Pain (on NPRS)-at rest	5/10	2/10	0/10
Pain (on NPRS)-on movement	9/10	5/10	2/10
Active shoulder ROM			
Flexion	90°	130°	170°
Extension	25°	40°	55°
Abduction	80°	120°	165°
Adduction	40°	42°	45°
External rotation	30°	50°	80°
Internal rotation	20°	35°	60°
Muscle strength (MMT)-right side			
Supraspinatus	2/5	$3^+/5$	$4^+/5$
Infraspinatus	2/5	$3^+/5$	$4^+/5$
Subscapularis	3/5	4/5	$4^+/5$
Deltoid (Anterior fibers)	3/5	4/5	$4^+/5$
Trapezius (Middle+lower)	3/5	4/5	5/5
Serratus anterior	3/5	4/5	5/5
Functional score			
DASH score	82%	49%	14%
UCLA shoulder score	14	24	31

Table 2: Short-term and long-term goals.

Short term goal (first 4 week)	Long term goal (By 8 week)
Reduces post-operative pain and inflammation using cryotherapy and modalities.	Restore full ROM of the right shoulder.
Initiate PROM and AAROM within pain free limits.	Achieve strength of 4+/5 or above in rotator cuff and scapular muscles.
Begin isometric activation of rotator cuff and scapular stabilizers.	Normalize scapulohumeral rhythm and shoulder mechanics.
Educate patient on posture, shoulder positioning, and joint protection.	Return to full work activities involving overhead and lifting tasks.
Improve DASH score by at least 30% from baseline.	Improve DAS score by >60% and UCLA score to >30.

Table 3: Rehabilitation protocol.

Physical therapy intervention	Week 1-2	Week 3-4	Week 5-6	Week 7-8
Flexion and extension at end range with slight resistance	10 reps, 3-5 set with 5-10 sec hold	Same treatment continued	Same treatment continued	Same treatment continued
Hand on opposite shoulder	10 reps, with 5-10 sec hold	Same treatment continued	Same treatment continued	Same treatment continued
Hand on back of head with horizontal adduction	10 reps	Same treatment continued	Same treatment continued	Treatment discontinued

Continued.

Physical therapy intervention	Week 1-2	Week 3-4	Week 5-6	Week 7-8
PNF	D1 and D2 flexion, extension with resistance 10 reps, 2 set	Same treatment continued	Same treatment continued	Same treatment continued
Faradic current		Low to moderate intensity for resistance visible	Moderate to severe intensity	Treatment discontinued
Russian current				Moderate intensity for resistance visible
Extension on prone	10 reps, 2sets with resistance	Same treatment continued	Same treatment continued	Same treatment continued
Scapula retraction exercise by tying hand at back	10 reps, 2 sets with resistance	Same treatment continued	Same treatment continued	Same treatment continued
Scapular retraction (t and w shape)	10 reps, 2 sets with resistance	Same treatment continued	Same treatment continued	Same treatment continued
Quadruped with shoulder movement for scapular stabilization			10 reps with 3 set	Same treatment continued
Quadruped with perturbation			Mild to moderate perturbation for 30 sec-1 min	Moderate to severe perturbation for 1min
Flexion on sitting	10 reps with 90^0 for 10 to 20 sec	10 reps with 90° with ½ kg dumbbell	10 reps with 90° with 1kg dumbbell	Same protocol followed
Abduction on sitting	10 reps with 90^0 for 10 to 20 sec	10 reps with 90° with ½ kg dumbbell	10 reps with 90° with 1kg dumbbell	Same protocol followed
Scapular squeezing	Scapular retraction with 10 reps, 1 to 2 sets	Scapular retraction with 10 reps, 1 to 2 sets with mild resistance using resistance band	Scapular retraction with 10 reps, 2 sets with moderate resistance using resistance band	Scapular retraction with 10 reps, 5 sets with severe resistance using resistance band
Shoulder external rotation in side lying	10 reps with 1 set	10 reps, 2 sets with mild resistance using resistance band	10 reps, 2 sets with mild to moderate resistance using resistance band	10 reps, 2 sets with moderate to severe resistance using resistance band
Shoulder flexion with rotation			10 reps, 2 sets	Same protocol followed
Wall push ups			10 reps, 2 sets with 10 sec hold	Same protocol followed
Wall slides			10 reps, 2 sets	Same protocol followed
Push ups				10 reps, 2 sets

DISCUSSION

This case demonstrates the comprehensive role of physiotherapy in the post-op rehabilitation of a 28-year-old male bike mechanic who presented with pain, reduced shoulder mobility, and impaired upper limb function following a work-related traumatic injury resulting in a type III SLAP lesion. Patient underwent arthroscopic SLAP repair, followed by period of immobilization lasting four weeks. Upon referral to physiotherapy, he exhibited significant limitations in shoulder flexion, abduction, and external rotation, coupled with supraspinatus and infraspinatus weakness and altered scapular rhythm-all of which severely affected his occupational performance involving frequent overhead tasks.

Pain intensity, assessed using the NPRS, was 9/10 during activity and 5/10 at rest, necessitating a dual focus on pain

management and restoration of functional capacity. Functional outcome measures including the DASH score and the UCLA shoulder score confirmed substantial limitations in daily activity and work-related tasks. A study by Thayaparan et al demonstrated that arthroscopic SLAP repair followed by structured physiotherapy can lead to over 80% success in returning to sport and work activities.[16] Similarly, Provencher et al emphasized that functional outcomes depend heavily on timely rehabilitation protocols and neuromuscular control restoration.[3]

Clinical assessment in this case revealed restricted joint mobility, muscle imbalance, scapular dyskinesis, and weakness of the rotator cuff musculature. The primary physiotherapy goals included restoring shoulder range of motion (ROM), improving rotator cuff and scapular strength, modulating pain, and enabling return to full occupational function. The treatment protocol incorporated passive and active-assisted ROM, electrical stimulation (Faradic and later Russian current) for the supraspinatus and infraspinatus, and manual scapular stabilization techniques. These approaches are consistent with recommendations by Wilk and Arrigo, who proposed a multi-phase rehabilitation framework focused on neuromuscular re-education, proprioception, and controlled strengthening.[7]

Advanced rehabilitation included PNF techniques, side-lying and prone-based rotator cuff training, closed-chain kinetic exercises such as wall push-ups and perturbation drills in quadruped, along with functional re-training simulating workplace tasks. Cryotherapy was used post-session to minimize inflammation and aid recovery. This multimodal protocol aligns with the findings of Steinmetz et al who emphasized that combining manual therapy, electrotherapy, and task-specific functional training accelerates neuromuscular recovery and reduces recurrence risk in SLAP cases.[9]

As rehabilitation progressed, objective gains were recorded in both clinical and functional metrics. The DASH score improved from 82% to 14%, and the UCLA score increased from 14/35 to 31/35. Muscle strength (based on MMT) improved to near-normal levels, and full active ROM was regained. These improvements allowed the patient to return to his occupation without restriction. A meta-analysis by Civan et al highlighted that such improvements are most consistently observed in patients who follow phase-wise rehabilitation under supervision.[12]

This case emphasizes the value of early referral, customized treatment planning, and the role of structured, progressive protocols tailored to the type of surgical intervention. Delays in mobilization or generalized rehab plans may contribute to adhesive capsulitis, persistent weakness, and delayed return to function.

Therefore, a personalized, phase-wise physiotherapy approach that adapts to surgical protocols, tissue healing timelines, and patient tolerance is critical to achieving optimal outcomes in SLAP lesion rehabilitation.[17]

CONCLUSION

The present case study demonstrates that a structured, progressive, and individualized physiotherapy rehabilitation program following posterior superior labral repair can effectively restore shoulder mobility, strength, and function. Early initiation of controlled mobilization, scapular stabilization, and strengthening exercises contributed to a faster and more complete recovery. Consistent adherence to rehabilitation and patient motivation played a vital role in achieving optimal outcomes. This report emphasizes the significance of evidence-based physiotherapy management in promoting functional restoration and safe return to occupational activities following SLAP repair.

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