

CASE REPORT

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# Bankart Lesion: A Case Study of Evidence-Based Post-Operative Physiotherapy Management

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## Abstract

**Objective:** To present an evidence-based post-operative physiotherapy management of Bankart lesion. **Clinical Features:** A 21-year-old male with a right shoulder Bankart lesion underwent corrective surgery after three years. Four weeks of intensive physiotherapy was initiated to restore shoulder function and improve his quality of life. **Intervention and Outcome:** Management included pain relief therapy and a progressive rehabilitation program focused on restoring range of motion, strengthening dynamic stabilizers, and improving shoulder proprioception. Four weeks post-operative physiotherapy, the patient regained full range of motion and strength comparable to the unaffected limb and was able to perform all daily functional activities. **Conclusion:** The case study on evidence-based postoperative physiotherapy management for Bankart lesions demonstrated substantial improvements in shoulder range of motion, muscle strength, and functional activity.

**Keywords:** Bankart Lesion; Post Physiotherapy Management; Rehabilitation

## 1 Introduction

The shoulder is a complex joint formed by the socket-shaped glenoid fossa and the spherical head of humerus. Surrounding the glenoid fossa is the labrum, a type of fibrocartilage that supports joint stability and maintains the positioning of the humeral head within the glenoid fossa<sup>1</sup>. A Bankart injury occurs when the anterior labrum is torn, typically due to shoulder dislocations, and is often associated with sports-related injuries.

A Bankart lesion generally involves the anterior region of the glenoid labrum and is often caused by recurrent anterior shoulder dislocations. Damage to the connective tissue ring of the glenoid labrum can result from these dislocations, leading to gleno-humeral ligament injuries due to repeated dislocations or inadequate reconstruction<sup>2</sup>.

Research indicates that individuals over 50 are more prone to developing bony Bankart lesions, whereas the median age for patients with primary

anterior shoulder dislocation is 35, affecting younger populations. Males constitute approximately 70% of all primary anterior shoulder dislocations, and in cases of bony Bankart lesions, the male prevalence is nearly 58.7%. According to Omoumi et al. (2011), 95% of shoulder instabilities occur anteriorly, largely because the scapula is aligned about 30 degrees with the body's frontal plane. Such injuries commonly happen when the arm is abducted in extension and externally rotated<sup>3</sup>. Low-energy falls are frequently the primary cause of these injuries. The aim of this research protocol is to develop an evidence-based physiotherapy method tailored for the post-operative management of Bankart lesions, focusing on improving patient outcomes and promoting successful rehabilitation techniques<sup>4</sup>.

## 2 Case

The patient, a 21-year-old male, had a history of anterior right shoulder dislocations caused by falling on an outstretched arm. Initially, he avoided visiting the hospital and managed the injury by resting, which temporarily relieved the pain. After three years of unbearable pain, he consulted a doctor, who referred him to an orthopaedic specialist. Imaging and tests diagnosed right shoulder Bankart lesion, and surgery was scheduled two months later.

On examination the patient's right glenohumeral joint range of motion was restricted for all the movements namely: Flexion, extension, abduction, adduction, internal rotation and external rotation ranging from 10 degree to 20 degree which is about 10% of the total range of motion as shown in the Table 2. Manual muscle testing (MMT) and Hand-held muscle dynamometer was used to check the muscle power of shoulder joint. The MMT showed muscle power ranging from 2+ to 3 out of 5 over all the muscle group namely flexors, extensor, abductors, adductors and rotators as shown in the Table 3. The hand-held dynamometer showed muscle power of 25 newtons to 65 newtons for all the muscle group of shoulder joint as shown in the Table 4. Following physical examination, a treatment program was immediately initiated as follows<sup>5-11</sup>:

- **Week 1**

**Cryotherapy** - To alleviate pain in the shoulder, cover the affected area with a towel and apply an ice pack while reclining in a comfortable position. Repeat this process three times a day for a week, with each application lasting 15 minutes.

- **Week 2**

**Pendulum Exercise** - Stand with one hand resting on a chair. Swing the opposite arm in a slow circular motion, forwards and backwards, while allowing it to hang freely. Repeat this exercise five times, two or three times daily.

**Wand Exercise** - Lie down on a firm bed and hold a piece of PVC piping around your waist with both hands. Maintain a straight elbow position as you move the piping from side to side and up and down. Perform 30 sets of this exercise three times a day.

- **Week 3**

- **Muscle Strengthening**

- \* PNF D1 And D2 Patterns with a Theraband - Utilize Proprioceptive Neuromuscular Facilitation (PNF) techniques with a theraband, focusing on D1 and D2 patterns to enhance strength. Perform these exercises with high sets and short repetitions. Each session should last 30 minutes, with three sets of ten repetitions and a 1-minute rest between sets.
- \* Push-Up on a Wobble Board - Perform push-ups on a wobble board to strengthen scapular stabilizers. Each session should last 20 minutes, with three sets of ten repetitions and a 1-minute rest between sets. This exercise promotes dynamic strength and stability in the shoulder joint.



Fig 1. D1 Flexion with theraband

- **Week 4**

- **Plyometric Exercises**

- Engage in balance board workouts to enhance upper-body stability and core strength. Start with hands on the board and feet behind, engaging core muscles, and gradually lower yourself while maintaining a straight line. Complete 5-10 reps.
- Perform dynamic up-and-down ball rolls on the wall with the right hand to improve coordination,



**Fig 2. D1 Extension with theraband**



**Fig 3. D2 Flexion with theraband**



**Fig 4. D2 Extension with theraband**

strength, and proprioception. Stand at arm's length from a wall and place your hands flat at shoulder height and width. Lean slightly forward and push yourself back to ensure straight arms. Complete twenty repetitions of this exercise.



**Fig 5. Ball rolls up on the wall with right hand**



**Fig 6. Ball rolls down on the wall with right hand**



**Fig 7. Weight bearing on the wobble board**

Following this four-week rehabilitation program, the patient was permitted to gradually return to pre-dislocation

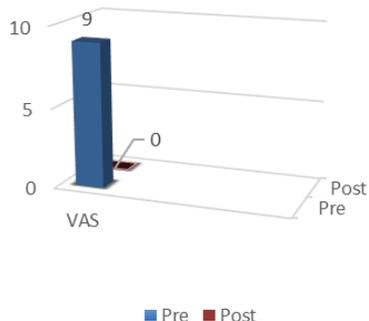
training. At this time, he had regained full range of motion and strength compared to the unaffected limb.

### 3 Results

The patient underwent four weeks of Physiotherapy management, where the changes of the Pain, Range of motion, Manual Muscle testing and Muscle strength were tabulated in the Tables 1, 2, 3 and 4. The Percentage of improvement in the Outcome values were graphically represented in the histogram as Graphs 1, 2, 3 and 4.

**Table 1. Changes in Visual analogue scale (VAS) pre and post rehabilitation**

Parameter	Pre- Rehabilitation	Post Rehabilitation	Percentage of Improvement
Visual analog scale	9/10	0/10	100%



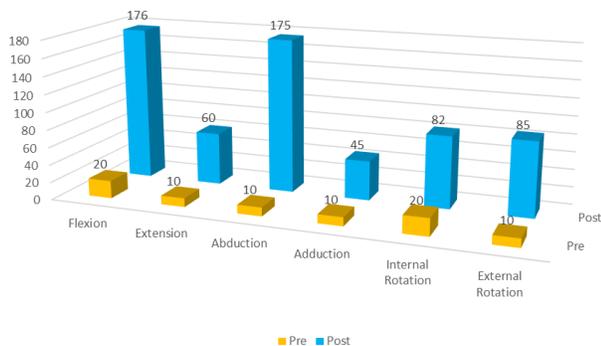
Graph 1: Shows VAS Changes

**Table 2. Changes in Shoulder Range of Motion pre and post rehabilitation**

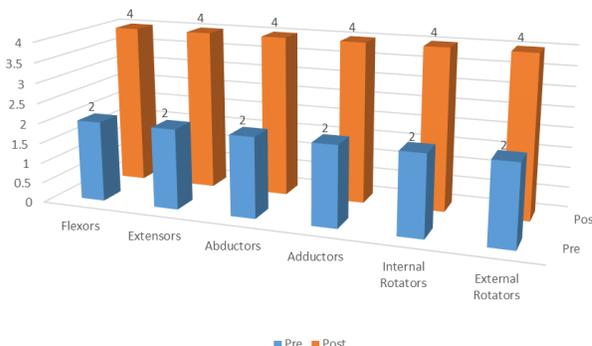
Active range of motion	Pre Rehabilitation	Post Rehabilitation	Percentage of Improvement
Flexion	0-20 degree	0-176 degree	99%
Extension	1-10 degree	0-60 degree	99%
Abduction	0-10 degree	0-175 degree	99%
Adduction	10-0 degree	45-0 degree	100%
Internal Rotation	0-20 degree	0-82 degree	95%
External Rotation	0-10 degree	0-85 degree	97%

**Table 3. Changes of Manual Muscle testing pre and after rehabilitation**

Shoulder Muscle Group	Pre- Rehabilitation	Post - Rehabilitation	Percentage of improvement
Shoulder flexors	2+ / 5	4 +/ 5	90%
Shoulder extensors	2+ / 5	4 +/ 5	90%
Shoulder abductors	2+ / 5	4 +/ 5	90%
Shoulder adductors	2+ / 5	4 +/ 5	90%
Internal Rotators	2+ / 5	4 +/ 5	90%
External rotators	2+ / 5	4 +/ 5	90%



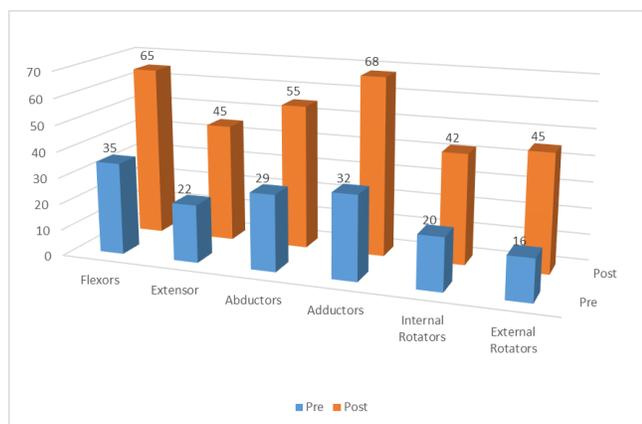
Graph 2: Changes in Shoulder Range of Motion



Graph 3: Manual Muscle Testing for Shoulder Muscles

**Table 4. Changes of Muscle Strength pre and after rehabilitation**

Shoulder Muscle Group	Pre-Rehabilitation (Newton)	Post Rehabilitation (Newton)	Left Shoulder Joint (Newton)	Percentage of improvement
Shoulder flexors	35 N	65 N	70 N	91%
Shoulder extensors	22 N	45 N	53 N	90%
Shoulder abductors	29 N	55 N	61 N	92%
Shoulder adductors	32 N	68 N	73 N	89%
Internal Rotators	20 N	42 N	55 N	89%
External rotators	16 N	45 N	60 N	85%



**Graph 4: Muscle Strength for Shoulder**

## 4 Discussion

When deciding on the best management approach for Bankart Lesion – traumatic anterior shoulder dislocations, surgeon chooses between operative and nonoperative treatments. The patient’s age at the initial dislocation plays a crucial role, as younger age is associated with a higher recurrence rate. Consequently, the literature suggests that a primary surgical approach might be advisable for younger individuals experiencing their first traumatic anterior dislocation<sup>12,13</sup>. Hence, the Patient in my case underwent corrective surgery followed by physiotherapy management.

The primary goal of rehabilitation is to restore the patient to a pain-free state with high functionality as quickly and safely as possible. Rehabilitation of the shoulder following

dislocation mainly focuses on improving the dynamic muscular restraints for shoulder stability. However, the evidence supporting rehabilitative exercises for managing anterior shoulder dislocations is limited<sup>5</sup>. A recent Cochrane review found no randomized controlled trials (RCTs) addressing any aspects of conservative management, including rehabilitation, for anterior shoulder dislocations. Most literature on rehabilitation protocols is based on expert opinion, highlighting a significant lack of robust evidence for drawing definitive conclusions.

Following the available protocol for treating a Bankart lesion based on the evidence available includes, four weeks of cryotherapy, an exercise regimen, and strengthening exercises, the patient’s range of motion improved to 90%, and pain was reduced to zero on a 10-point visual analogue scale (see Tables 1 and 2). Additionally, the patient regained approximately 95% of muscle strength according to manual muscle testing and 86% in the hold test using a handheld dynamometer (see Table 3 and Graph 3). These results align with previous studies that demonstrated significant improvements in muscle power.

Functional activities such as household chores, lifting, and overhead tasks were initially unmanageable due to pain and limited range of motion. The patient first underwent pain management, followed by mobilization, strengthening, and finally plyometric exercises. This progression allowed the patient to successfully perform activities like throwing, overhead lifting, weight lifting, and sleeping on the operated shoulder. Swanik *et al.* (2002) demonstrated significant improvements in proprioception in subjects trained with plyometric exercises<sup>8</sup>. Similarly, Naughton *et al.* (2004) improved proprioception in fifteen subjects with previous anterior dislocations using an upper-body wobble board training regimen, where subjects stabilized themselves with shoulder movements while balancing on a wobble board with a Swiss ball under their pelvis<sup>9</sup>. The current case study aligns with previous research regarding functional activity training as above.

Overall, this case study indicates a correlation between physiotherapy training and anterior shoulder instability. Anterior dislocations likely cause mechanical laxity, which alters motor control of the dynamic stabilizers and predisposes individuals to further shoulder injuries. Post-operative physiotherapy training can improve shoulder function and activity of daily life in bankart lesion.

## 5 Conclusion

The case study on evidence-based postoperative physiotherapy management for Bankart lesions demonstrated substantial improvements in shoulder range of motion, muscle strength, and functional activity.

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