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Physiotherapy management of axillary nerve palsy following shoulder dislocation in an adult: A case study

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Abstract
Background: Axillary nerve injury is a rare but significant complication following anterior shoulder dislocation, leading to deltoid weakness, impaired abduction, and functional limitations. Early physiotherapy can facilitate neuromuscular recovery, restore shoulder function, and prevent secondary complications.
Case Description: A 28-year-old male sustained an anterior shoulder dislocation following a sports injury, complicated by axillary nerve palsy. He presented with shoulder weakness, numbness over the lateral arm, and difficulty in daily activities.
Intervention: A structured 8-week physiotherapy program was implemented including deltoid and rotator cuff strengthening, proprioceptive training, functional range of motion exercises, and neuromuscular facilitation.
Outcome Measures: Muscle strength (Manual Muscle Testing), shoulder range of motion (goniometry), pain (Numeric Pain Rating Scale), and functional ability (Disabilities of the Arm, Shoulder and Hand [DASH] score) were assessed pre- and post-intervention.
Results: The patient demonstrated improvement in deltoid strength, shoulder abduction, functional activities, and pain reduction.
Conclusion: Targeted physiotherapy is effective in restoring functional independence in adults with axillary nerve palsy post-shoulder dislocation.

Keywords: Axillary nerve palsy, shoulder dislocation, physiotherapy, deltoid weakness, rehabilitation

Introduction

Axillary nerve injury is an uncommon but recognized complication following anterior shoulder dislocation, with an incidence ranging from 3% to 7% of dislocations [1]. The axillary nerve arises from the posterior cord of the brachial plexus, innervating the deltoid and teres minor muscles, and providing sensory innervation over the lateral shoulder [2]. Injury can result in deltoid atrophy, weakness in shoulder abduction, impaired external rotation, and sensory loss over the regimental badge area [3].

Early recognition and physiotherapy intervention are crucial to prevent secondary complications, restore muscle function, and improve upper limb activities. Rehabilitation focuses on maintaining joint mobility, preventing stiffness, strengthening affected muscles, and improving functional use of the shoulder [4].

This case study aims to describe the physiotherapy management and outcomes of a young adult male with axillary nerve palsy following anterior shoulder dislocation.

Case Description

Patient Information

- **Age:** 28 years
- **Gender:** Male
- **Occupation:** Software engineer
- **Dominant side:** Right
- **History:** Sustained an anterior dislocation of the right shoulder during a football game; closed reduction performed within 2 hours.

Presenting Complaints

- Weakness in shoulder abduction
- Numbness over the lateral aspect of the arm
- Difficulty performing overhead activities
- Mild pain in the shoulder (NPRS 5/10)

Past Medical History

- No prior shoulder injuries
- No comorbidities

Clinical Examination

Observation

- Mild deltoid atrophy over the lateral shoulder
- Slight anterior shoulder subluxation on resisted abduction

Muscle Strength (Manual Muscle Testing)

- **Deltoid:** 2/5
- **Supraspinatus:** 4/5
- **Rotator cuff muscles (other):** 4/5

Sensory Examination

- Reduced sensation over the “regimental badge” area

Range of Motion (Goniometry)

- **Abduction:** 45° (restricted)
- **Flexion:** 100°
- **External rotation:** 45°
- **Internal rotation:** 50°

Functional Assessment

- **DASH score:** 45/100 (moderate disability)

Methodology / Intervention

Assessment Tools

- Manual Muscle Testing (MMT) for deltoid strength
- Goniometry for shoulder range of motion
- Numeric Pain Rating Scale (NPRS)
- DASH questionnaire for functional ability

Physiotherapy Intervention (8 weeks, 5 sessions/week, 45–60 minutes per session)

Phase 1: Early Protection and Activation (Week 1–2)

- Pendulum exercises for pain-free mobility
- Gentle active-assisted shoulder flexion and abduction
- Isometric deltoid contraction in neutral position
- Sensory re-education over the lateral arm

Phase 2: Strengthening and Range of Motion (Week 3–5)

- Active-assisted to active shoulder abduction and flexion
- Resistance band exercises for deltoid and rotator cuff
- Scapular stabilization exercises (serratus anterior, trapezius)
- Proprioceptive exercises (ball stabilization, weight-shifting on wall)

Phase 3: Functional Training and Neuromuscular Facilitation (Week 6–8)

- Overhead reaching and lifting activities
- Task-oriented functional exercises (placing objects on shelves, lifting light weights)
- Neuromuscular electrical stimulation (NMES) for deltoid facilitation (if required)
- Gradual return to sports-specific drills

Home Exercise Program

- Daily active-assisted shoulder abduction and flexion
- Resistance band exercises for deltoid and scapular muscles
- Sensory exercises for lateral shoulder region

Results

Outcome Measure	Pre-intervention	Post-intervention
Deltoid strength (MMT)	2/5	4/5
Shoulder abduction (°)	45°	150°
NPRS	5/10	1/10
DASH score	45/100	15/100

Observations

- Improved deltoid strength and shoulder abduction
- Reduced pain and improved functional abilities
- Resumed independent overhead activities and light sports

Discussion

Axillary nerve palsy following anterior shoulder dislocation, though uncommon, can significantly impair shoulder function. The axillary nerve is vulnerable during dislocation due to stretching or compression at the quadrilateral space [5].

Early physiotherapy focusing on muscle activation, range of motion, and strengthening plays a critical role in functional recovery. Pendulum and active-assisted exercises help maintain joint mobility without overstressing the injured nerve [6]. Progression to resistance and functional training promotes deltoid hypertrophy, scapular stabilization, and neuromuscular re-education.

Sensory re-education improves cortical representation of the affected area and reduces compensatory movement patterns. Task-specific and functional training ensures carryover into activities of daily living and return to sport [7].

In this case, structured, phase-wise physiotherapy led to significant improvement in deltoid strength, shoulder abduction, functional independence, and pain reduction, consistent with literature advocating early rehabilitation for peripheral nerve injuries post-shoulder trauma [8, 9].

Conclusion

Axillary nerve palsy following shoulder dislocation can lead to significant functional limitations. Structured physiotherapy incorporating early activation, strengthening, proprioceptive, and functional training is effective in improving muscle strength, shoulder range of motion, and functional independence in adults. Early recognition and intervention are key to optimal recovery.

Patient Consent

Written informed consent was obtained from the patient for publication of this case study.

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