

A Case of Conservative Physiotherapy Management of Inferior Shoulder Dislocation: Enhancing Quality of Life, Sleep, Range of Motion, Muscle Strength, Reflexes, and Pain Alleviation

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ABSTRACT

Inferior shoulder dislocation is a rare but increasingly reported condition, frequently associated with rotator cuff injuries, greater tuberosity fractures, and neurovascular deficits. Previous studies have focussed on surgical reduction under anaesthesia; however, conservative management remains overlooked. This case report presents a 28-year-old male who experienced an inferior shoulder dislocation due to a motor vehicle accident, accompanied by a partial supraspinatus tear, subacromial impingement, bursitis, glenohumeral effusion, a Superior Labrum Anterior to Posterior (SLAP) tear, and brachial plexus neuritis affecting the C5-C6 trunk. Initial assessment showed restricted Range of Motion (ROM) (10°-20°), weak muscle strength (Manual Muscle Test; MMT 1/5), absent reflexes, altered sensation, severe pain {Visual Analogue Scale (VAS) 10} and limited functional independence {Shoulder Pain and Disability Index (SPADI) 93%, Disabilities of the Arm, Shoulder, and Hand (DASH) 95%}. A four-month physiotherapy programme designed for pain management, muscle strengthening, scapular stabilisation, and functional recovery resulted in significant improvements, with complete pain relief, improved strength (MMT 4/5), full ROM recovery, and marked functional independence (SPADI and DASH scores reduced from 93% and 95% at the beginning to 40% and 32.5%, respectively, post-treatment, corresponding to a percentage reduction of 57% and 66%, respectively). Conservative physiotherapy effectively addressed both orthopaedic and neurological impairments, restoring mobility, strength, and function without surgical intervention. The aim of this regimen was to conservatively manage the inferior shoulder dislocation of shoulder by reducing pain, improving ROM, muscle strength, quality of life and sleep quality. This report highlights the potential of customised rehabilitation in treating complex shoulder dislocations conservatively, offering an economically viable and patient-preferred alternative to surgery.

Keywords: Brachial plexus injury, Conservative management, Inferior dislocation, Physiotherapy rehabilitation, Superior labrum anterior to posterior tear

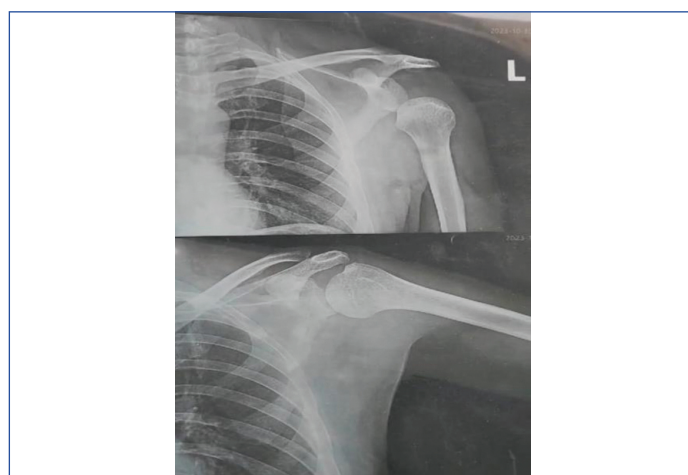
CASE REPORT

A 28-year-old male, who was under the influence of alcohol and involved in a motor vehicle accident one month ago, presented with complaints of severe left shoulder pain, limited movement, and functional restrictions following the incident. The patient received prior medical assistance before physiotherapy treatment, including Intensive Care Unit (ICU) admission, intravenous fluids, injectable medications (Makopan, Ondex, PCM, Monocef), and supportive management under orthopaedic and neurological consultation. The patient faced difficulties in performing Activities of Daily Living (ADLs), including dressing and overhead activities, due to pain and weakness.

The accident involved a collision with a large truck, followed by a fall onto an abducted left shoulder, causing a sudden loss of movement and continuous pain. There was no previous history of shoulder instability, trauma, or significant comorbidities. The family history was non-significant.

On physical examination, the patient's left shoulder was noted to be in an adducted and internally rotated position. Tenderness was present over the glenohumeral joint, and there was severe pain when the patient attempted movement. Radiological investigations revealed that the humeral head was slightly medially rotated and displaced inferiorly to the glenoid rim [Table/Fig-1].

Magnetic Resonance Imaging (MRI) and Nerve Conduction Velocity (NCV) tests showed a partial tear of the supraspinatus tendon, subacromial impingement, subdeltoid bursitis, mild to moderate



[Table/Fig-1]: Pre-treatment X-ray showing inferior shoulder dislocation and medial rotation.

effusion in the glenohumeral joint, and a SLAP tear. The NCV also indicated brachial plexus neuritis, particularly involving the C5-C6 trunks, while the Electromyography (EMG) showed neurogenic changes in the left deltoid muscle. The differential diagnoses included isolated rotator cuff injury, nerve compression syndrome, and posterior shoulder dislocation; however, imaging confirmed the final diagnosis of an inferior shoulder dislocation with associated neurovascular injury.

On performing a neurological assessment, reflexes at C5-C6 were found to be absent, sensation over the deltoid region was altered, and muscle weakness (MMT 1/5) was present in the shoulder abductors and external rotators. While performing sensory assessment, fine touch was evaluated using a cotton wisp applied to the C5-C6 dermatome of the left arm, temperature sensation was tested with hot and cold test tubes (40°C and 20°C), and deep pressure was evaluated by applying firm digital pressure over the dermatome. All three sensations were found to be diminished. Deep tendon reflexes (biceps and triceps) were elicited using a standard neurological reflex hammer and were found to be diminished.

Informed consent was obtained from the patient, and the CARE guidelines were followed for this case report. Quality of life was assessed using the SPADI and DASH questionnaires [1,2]. Assessments were performed at baseline (Day 1) and repeated at the end of the programme (Day 120) to document changes.

The patient underwent a designed four-month physiotherapy rehabilitation programme, carried out in four stages, each lasting for 30 days. The programme emphasised pain reduction through the application of Transcutaneous Electrical Nerve Stimulation (TENS), Interferential Therapy (IFT), Neuromuscular Electrical Stimulation (NMES), and Low-Level Laser Therapy (LLLT), along with progressive ROM exercises, Proprioceptive Neuromuscular Facilitation (PNF), and scapular stabilisation techniques [3-7].

In Stage 1, the focus was on pain management and early recovery. Electrotherapy modalities, such as TENS, IFT, NMES, and LLLT, improved pain intensity and initiated soft tissue healing. Progressive ROM exercises, PNF techniques, and scapular stabilisation exercises helped prevent contractures and activated muscle groups [3-7].

In Stage 2, electrical stimulation, such as intermittent galvanic current, was applied alternately with TENS on alternate days to stimulate the deltoid muscle and prevent further atrophy. This approach also enhanced strength and functionality. LLLT continued alongside these treatments, with PNF exercises and rhythmic stabilisation introduced to strengthen the shoulder stabilisers.

Stage 3 aimed at further strengthening the muscles and enhancing nerve stimulation while maintaining ROM and introducing resistance exercises. TENS in burst mode was used to stimulate the muscles more deeply. ROM exercises with one-kilogram dumbbells targeted shoulder elevation and endurance, while rhythmic stabilisation and pendulum exercises were added to promote mobility and joint stability. Wall ladder exercises and closed kinetic chain exercises were incorporated to strengthen the scapular stabilisers.

Stage 4 focused on advanced rehabilitation, targeting biceps activation, improving abduction beyond 90°, and strengthening muscles. A muscle stimulator was used to activate the biceps, and theratube exercises were added to provide resistance. Exercises such as back burn [Table/Fig-2] and ITW exercises were introduced to enhance

scapular stability and posture, as well as to improve shoulder strength. The exercise regimen for the patient is detailed in [Table/Fig-3].

| Stage | Focus area | Exercise progression |
|-----------------------|---------------------------------------------|---------------------------|
| Stage 1 (Days 1-30) | Pain relief, ROM initiation | 1 → 2 → 3 sets of 10 reps |
| Stage 2 (Days 31-60) | Muscle stimulation, strength | 1 → 2 → 3 sets of 10 reps |
| Stage 3 (Days 61-90) | Resistance training, endurance | 1 → 2 → 3 sets of 10 reps |
| Stage 4 (Days 91-120) | Scapular stabilisation, functional strength | 1 → 2 → 3 sets of 10 reps |

[Table/Fig-3]: Exercise regimen for the patient.

ROM: Range of motion

Note: Repetitions gradually increased across stages depending on patient tolerance

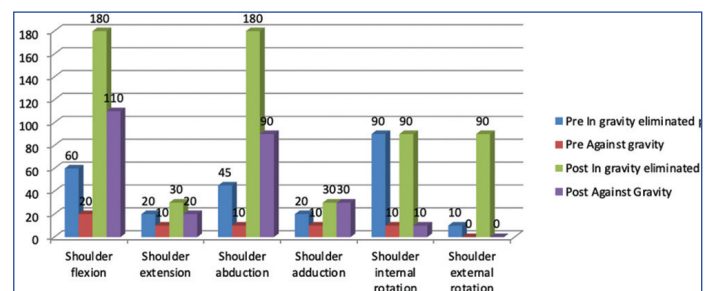
As time passed, the patient achieved complete pain relief [Visual Analogue Scale (VAS) improved from 10/10 to 0/10], improved ROM (from 20° to 180°), significant muscle strength recovery MMT improved from 1/5 to 4/5), and improved functional independence (SPADI reduced by 57% and DASH by 66%). The patient accomplished complete sensation and reflexes, indicating spontaneous nerve recovery. Follow-up sessions and assessments validated continuous progress, and there was no need for surgical intervention [Table/Fig-4].



[Table/Fig-4]: Post-treatment X-ray showing realigned shoulder anatomy.

This case demonstrates that a structured, conservative physiotherapy programme, incorporating electrotherapy and exercise therapy, can significantly improve the prognosis of patients with luxatio erecta and brachial plexus injury across multiple aspects.

ROM significantly improved: shoulder abduction increased from 20° (gravity-eliminated) to 90°, and nearly full range (180°) against gravity was achieved [Table/Fig-5].



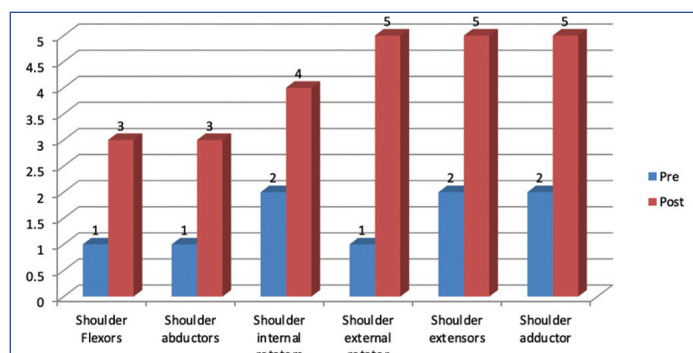
[Table/Fig-5]: Showing pre- and post-assessment results of Range Of Motion (ROM).

With improved muscle strength (MMT from 1/5 to 4/5), the patient became capable of carrying out daily tasks, such as dressing,



[Table/Fig-2]: Patient performing "back burn" exercises during advanced rehabilitation stage.

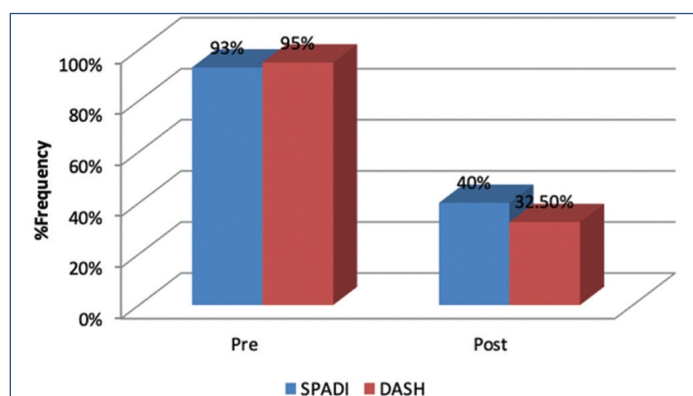
bathing, and carrying objects. However, challenges remained in performing overhead activities [Table/Fig-6].



[Table/Fig-6]: Showing pre- and post-results of MMT.

Pain intensity, quantified using the VAS, reduced from 10/10 to 0/10, indicating complete pain resolution.

The reduction in SPADI and DASH scores from 93% and 95% at the beginning to 40% and 32.5%, respectively, post-treatment corresponds to percentage reductions of 57% and 66%, respectively. This indicates a substantial improvement in functional independence [Table/Fig-7].



[Table/Fig-7]: Pre and post-results of SPADI and DASH scores

Pain management showed significant improvement, with the VAS score reducing from 10 to 0, indicating complete pain resolution. This led to better sleep quality and an overall improvement in the patient's quality of life.

Improvement in sensation and reflexes at the C5-C6 dermatome demonstrated spontaneous nerve recovery, highlighting positive neurological progress [Table/Fig-8].

| Parameter | Pre-treatment finding | Post-treatment finding |
|------------------------|-----------------------------------------------|-------------------------------------------|
| Fine touch | Diminished at C5-C6 dermatome of the left arm | Intact at C5-C6 dermatome of the left arm |
| Temperature (hot/cold) | Diminished at C5-C6 dermatome of the left arm | Intact at C5-C6 dermatome of the left arm |
| Deep pressure | Diminished at C5-C6 dermatome of the left arm | Intact at C5-C6 dermatome of the left arm |
| Biceps tendon reflex | Diminished | Intact |
| Triceps tendon reflex | Diminished | Intact |

[Table/Fig-8]: Pre- and post-treatment sensory and reflex assessments.

All assessments were repeated at the end of the four-month physiotherapy programme and showed full restoration of sensory function and deep tendon reflexes.

DISCUSSION

Inferior dislocation of the shoulder is a highly rare condition, but it is often associated with rotator cuff injuries, greater tuberosity fractures, and impaired neurovascular structures [8-10]. Conventional treatment methods have typically preferred surgical reduction under anaesthesia [11], but there is an increasing inclination towards

conservative care for patients who are not suitable for surgery or who prefer conservative treatment.

This case presents a 28-year-old male patient who experienced inferior dislocation of the shoulder associated with a SLAP lesion and brachial plexus injury (C5-C6). The patient presented with complaints of severe pain (VAS 10/10), reduced ROM (10°-20°), extreme upper limb muscle weakness (MMT 1/5), and profound functional disability (SPADI 93%, DASH 95%). The inferior dislocation associated with soft-tissue injuries and nerve involvement was confirmed by radiographic studies and MRI. After undergoing a properly designed four-month rehabilitation programme, the patient experienced complete pain reduction, improved ROM, enhanced muscle strength, and significant functional gains (SPADI decreased by 57%, DASH decreased by 66%), with complete neurological recovery.

There have been many reports supporting the conservative management of inferior dislocation of the shoulder. For example, Memar SA et al., described a case of luxatio erecta humeri following a fall in an elderly woman, which was managed successfully with physiotherapy; however, it also emphasised the role of surgical reduction [12]. de Santana Chagas AC et al., also reported a case where traumatic brachial plexus injury caused by shoulder dislocation was treated, achieving full recovery and pain reduction after conservative treatment [5].

This case demonstrated a tailor-made four-staged rehabilitation programme that began with pain control and early mobilisation using TENS, IFT, NMES, and LLLT. It progressed through muscle activation and strengthening with PNF and resistance training, and concluded with advanced scapular stabilisation and functional exercises. This programme resulted in the full restoration of shoulder function, pain relief, and management of neurological deficits. This customised treatment approach enabled the therapist to provide the patient with safe, progressive loading of the injured structures, leading to tissue healing and neuromuscular re-education without surgical intervention.

Clinically, these reports pave the way for understanding the importance of non-surgical approaches or conservative physiotherapy rehabilitation as a successful cost-effective alternative to surgery for managing complex shoulder dislocations, especially in cases where the patient is not a good candidate for surgery, surgical resources are limited, or the patient prefers a non-surgical approach.

Despite the success, limitations in this case included the absence of advanced techniques like mobilisation (e.g., Mulligan's mobilisation with movement) or kinesiio taping, which could have enhanced treatment efficacy and accelerated recovery. Additionally, the lack of follow-up data restricts insights into achievements in pain, function, and neuromuscular recovery. Future studies should incorporate advanced methods such as mobilisation techniques and kinesiio taping, as well as longitudinal evaluation to validate and expand these findings. Extended follow-up periods are required to evaluate long-term benefits.

CONCLUSION(S)

Physiotherapy played a significant role in the management of inferior shoulder dislocation accompanied by brachial plexus injury, resulting in a reduction of pain, improved strength, and enabling the patient to regain full functional independence. This also contributed to an improvement in psychological and social well-being.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Mar 03, 2025
- Manual Googling: May 19, 2025
- iThenticate Software: Jun 14, 2025 (4%)

ETYMOLOGY: Author Origin**EMENDATIONS:** 6**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Feb 23, 2025**Date of Peer Review: **Apr 16, 2025**Date of Acceptance: **Jun 16, 2025**Date of Publishing: **Jul 01, 2025**