

Physiotherapy Rehabilitation Of Bilateral Adhesive Capsulitis In A Patient With Ankylosing Spondylitis: A Case Report

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ABSTRACT

Background: Ankylosing spondylitis (AS) is a chronic inflammatory disease that primarily affects the axial skeleton, leading to pain, stiffness, postural abnormalities, and reduced functional mobility. Although shoulder involvement may occur in AS, bilateral adhesive capsulitis (frozen shoulder) is relatively uncommon and can significantly impair activities of daily living. Physiotherapy plays a vital role in reducing pain, improving joint mobility, and restoring functional independence. **Case Presentation:** A 45-year-old male shopkeeper presented with bilateral shoulder pain, marked restriction of overhead activities, neck stiffness, forward head posture, increased thoracic kyphosis, and reduced cervical extension. The patient reported difficulty performing activities of daily living, including combing hair, dressing, and reaching overhead. The initial pain intensity was 8/10 on the Numeric Pain Rating Scale (NPRS). **Intervention:** The patient underwent a comprehensive physiotherapy rehabilitation program consisting of Transcutaneous Electrical Nerve Stimulation (TENS), therapeutic ultrasound, shoulder joint mobilization, finger ladder exercises, pulley exercises, wand exercises, shoulder isometric strengthening, cervical mobility exercises, postural correction exercises, and a structured home exercise program. Each treatment session lasted approximately 60 minutes. **Outcome:** Following the rehabilitation program, the patient demonstrated a reduction in pain, improved shoulder range of motion, enhanced cervical mobility, improved posture, and better performance of functional activities, including overhead reaching and combing hair. **Conclusion:** This case highlights the importance of early physiotherapy rehabilitation in the management of bilateral adhesive capsulitis associated with ankylosing spondylitis. A structured rehabilitation program may effectively improve pain, joint mobility, posture, and functional independence.

Keywords: Ankylosing spondylitis, Bilateral adhesive capsulitis, Frozen shoulder, Physiotherapy, Rehabilitation, Case report.

INTRODUCTION

Ankylosing spondylitis (AS) is a chronic, progressive inflammatory rheumatic disease that primarily affects the sacroiliac joints and axial skeleton, leading to pain, stiffness, reduced spinal mobility, and progressive postural deformities. The disease usually begins in early adulthood and is more common in males. If left untreated, chronic inflammation may result in spinal ankylosis, functional disability, and reduced quality of life. [1,2]

Although the axial skeleton is predominantly involved, peripheral joints such as the hips and shoulders may also be affected. Shoulder involvement can present with pain, stiffness, reduced range of

motion, and impaired upper-limb function, significantly limiting activities of daily living. Bilateral adhesive capsulitis (frozen shoulder) occurring in association with ankylosing spondylitis is relatively uncommon and presents additional rehabilitation challenges due to the combined effects of joint inflammation and capsular restriction. [3,4]

Adhesive capsulitis is characterized by progressive pain and marked restriction of both active and passive glenohumeral joint movements. Patients commonly experience difficulty performing activities such as overhead reaching, dressing, grooming, and combing hair, which negatively affect functional independence and quality of life. [5]

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Physiotherapy plays a key role in the conservative management of both ankylosing spondylitis and adhesive capsulitis. Evidence supports the use of patient education, pain-relieving modalities, manual therapy, stretching, range-of-motion exercises, strengthening exercises, posture correction, and home exercise programs to reduce pain, improve mobility, and restore functional ability. Early rehabilitation is particularly important to prevent further stiffness and disability. [6,7]

This case report describes the physiotherapy rehabilitation of a 45-year-old male diagnosed with ankylosing spondylitis associated with bilateral adhesive capsulitis. The report highlights the patient's clinical presentation, physiotherapy assessment, rehabilitation program, and functional outcomes following a structured physiotherapy intervention. The purpose of this report is to demonstrate the role of comprehensive physiotherapy in improving pain, joint mobility, posture, and functional independence in this uncommon clinical presentation.

CASE PRESENTATION

A 45-year-old male shopkeeper came to the Physiotherapy Outpatient Department (OPD) complaining of bilateral shoulder discomfort, growing stiffness, and trouble doing overhead tasks. The patient also complained of neck stiffness, limited cervical movements, and trouble maintaining a comfortable supine posture since constrained cervical extension prevented the neck from resting completely on the pillow. These symptoms made it difficult to do everyday things like getting ready, combing hair, reaching above, and carrying heavy items over the shoulder level.

The patient had ankylosing spondylitis, a confirmed medical disorder, and was sent for physical therapy rehabilitation for bilateral shoulder discomfort and limited range of motion. On the Numeric Pain Rating Scale (NPRS), the first pain level was 8/10. No past shoulder operations, traumas, or fractures were mentioned.

The patient's stooped posture on postural evaluation showed forward head posture, more thoracic kyphosis, rounded shoulders, and less cervical extension. Along with neck stiffness, clinical examination showed significant bilateral active and

passive shoulder movement limitation, especially during overhead activities. These results were in line with bilateral adhesive capsulitis linked to ankylosing spondylitis.

A thorough physiotherapy evaluation was carried out and a tailored rehabilitation program developed to help patients to control pain, increase shoulder and cervical range of motion, rectify posture, build muscle strength, and recover functional independence.

Clinical Examination and Physiotherapy Assessment

General Examination

Age – 45 years

Gender – Male

Occupation- Shopkeeper

Diagnosis- Ankylosing spondylitis with Bilateral Adhesive Capsulitis

Observation

On observation, the patient demonstrated:

- Forward head posture
- Increased thoracic kyphosis
- Rounded shoulders
- Reduced cervical extension
- Stooped posture
- Bilateral restriction of shoulder movements
- Difficulty performing overhead activities

On palpation:

- Tenderness present over the anterior and lateral aspects of both shoulders.
- Muscle tightness noted in the upper trapezius, levator scapulae, and posterior cervical muscles.
- Glenohumeral joint capsular tightness appreciated during passive movement.

Range of Motion (ROM)

Active and passive ROM of both shoulders and the cervical spine were assessed using a universal goniometer.

Movement	Normal ROM	Before Treatment	After Treatment
Flexion	45°	27°	39°
Extension	45°	22°	37°
Right Lateral flexion	40°	17°	25°
Left Lateral Flexion	40°	16°	23°
Right Rotation	60°	38°	45°
Left Rotation	60°	37°	45°

Table 1. Cervical Range of Motion

Movement	Normal ROM	Before Treatment	After Treatment
Flexion	180°	90°	150°
Extension	60°	30°	50°
Abduction	180°	80°	145°
Adduction	30°- 45°	20°	35°
Internal Rotation	70°	40°	60°
External Rotation	90°	20°	65°

Table 2. Right Shoulder Range of Motion

Movement	Normal ROM	Before Treatment	After Treatment
Flexion	180°	95°	155°
Extension	60°	35°	50°
Abduction	180°	85°	150°
Adduction	30°- 45°	20°	35°
Internal Rotation	70°	45°	60°
External Rotation	90°	25°	65°

Table 3. Left Shoulder Range of Motion

Manual Muscle Testing (MMT)

Muscle strength of the shoulder girdle was assessed using the Medical Research Council (MRC) grading system.

Muscle Group	Right(Before)	Right (After)	Left (Before)	Left (After)
Shoulder flexors	3+/5	4+/5	3+/5	4+/5
Shoulder Extensors	4-/5	5/5	4-/5	5/5
Shoulder Abductors	3+/5	4+/5	3+/5	4+/5
Shoulder Adductors	4/5	5/5	4/5	5/5
Internal Rotators	4-/5	4+/5	4-/5	4+/5
External Rotators	3+/5	4+/5	3+/5	4+/5

Table 4. Manual Muscle Testing

Pain Assessment

Pain intensity was assessed using the Numeric Pain Rating Scale (NPRS).

Assessment	Before Treatment	After Treatment
NPRS Score	8/10	3/10

Pain intensity was assessed using the Numeric Pain Rating Scale (NPRS).

Functional Assessment

The patient had difficulty performing the following activities of daily living:

- Overhead reaching
- Combing hair
- Dressing
- Grooming
- Reaching behind the back
- Lifting objects above shoulder level
- Neck movements during daily activities
- Sleeping comfortably in the supine position

Special Tests

The following special tests were performed:

Painful Arc Test Positive bilaterally

Functional Assessment

Difficulty with overhead activities and ADLs

Outcome Measures

The following outcome measures were used:

- Numeric Pain Rating Scale (NPRS)
- Goniometric assessment of cervical ROM
- Goniometric assessment of bilateral shoulder ROM
- Manual Muscle Testing (MMT)
- Functional assessment of activities of daily living (ADLs)

Physiotherapy Diagnosis

Based on the subjective history and clinical examination, the physiotherapy diagnosis was: Pain, restricted active and passive range of motion of both shoulders, cervical stiffness, postural abnormalities, reduced muscle performance, and limitation in activities of daily living secondary to bilateral

adhesive capsulitis associated with ankylosing spondylitis.

Treatment Goals

Short-Term Goals (2–4 weeks)

- Reduce bilateral shoulder pain.
- Improve active and passive shoulder ROM.
- Decrease cervical stiffness.
- Improve cervical mobility.
- Correct forward head posture and thoracic kyphosis.
- Improve glenohumeral joint mobility.
- Reduce muscle tightness around the cervical and shoulder girdle.
- Improve performance of activities of daily living (ADLs).

Long-Term Goals (6–8 weeks)

- Restore functional shoulder ROM.
- Improve muscle strength of the shoulder girdle.
- Improve postural alignment.
- Enable independent performance of overhead activities.
- Improve functional independence and quality of life.
- Prevent recurrence through education and a home exercise program.

Physiotherapy Intervention

A comprehensive physiotherapy rehabilitation program was administered 5 days per week, with each session lasting approximately 60 minutes. The treatment protocol aimed to reduce pain, improve shoulder and cervical mobility, correct postural abnormalities, increase muscle strength, and restore functional independence.

Electrotherapy

- Transcutaneous Electrical Nerve Stimulation (TENS) was applied to both shoulders for pain relief.

- Therapeutic Ultrasound (US) was administered over the bilateral shoulder joints to reduce pain and improve soft tissue extensibility.

Manual Therapy

- Grade I–II glenohumeral joint mobilization (progressing as tolerated) was performed to reduce pain and improve capsular mobility.
- Passive stretching of the shoulder joint was carried out within the patient's pain tolerance.

Therapeutic Exercises

Shoulder Mobility Exercises

- Finger Ladder Exercise
- Shoulder Pulley Exercise
- Wand Exercises (Supine and Standing)
- Active Assisted Range of Motion (AAROM)
- Active Range of Motion (AROM)

Strengthening Exercises

- Shoulder Isometric Exercises
- Static Quadriceps Exercise
- Straight Leg Raise (SLR)
- Side-Lying Hip Abduction (SLA), if prescribed
- Progressive strengthening exercises as tolerated

Functional Training

- Overhead reaching activities
- Functional reaching exercises
- Activities simulating activities of daily living (ADLs)

Aerobic Conditioning

- Stationary Cycling

Home Exercise Program

The patient was instructed to continue:

- Shoulder ROM exercises

- Wand exercises
- Finger ladder exercises (if available)
- Postural correction exercises
- Cervical ROM exercises
- Isometric shoulder strengthening
- Home stretching program
- Advice to avoid prolonged poor posture and perform exercises regularly.

Treatment Protocol Summary

Intervention	Frequency
TENS	Every session
Therapeutic Ultrasound	Every session
Joint Mobilization	Every session
Finger ladder	Every session
Pulley Exercise	Every session
Wand Exercise	Every session
Shoulder Isometrics	Every session
Static Quadriceps	Every session
Straight leg raises (SLR)	Every session
Side lying Hip Abduction (SLA)	Every session
Stationary Cycling	Every session
Home Exercise Program	Daily

RESULTS / OUTCOME

Results

Following the completion of the physiotherapy rehabilitation program, the patient demonstrated significant clinical and functional improvement.

Pain

The Numeric Pain Rating Scale (NPRS) score decreased from **8/10** before treatment to **3/10** after completion of the rehabilitation program.

Range of Motion

Active and passive range of motion of both shoulder joints improved in all planes of movement. Cervical spine mobility, particularly extension and rotation, also improved, resulting in reduced neck stiffness.

Muscle Strength

Manual Muscle Testing demonstrated improvement in the strength of the shoulder musculature compared with the initial assessment.

Functional Improvement

The patient showed marked improvement in activities of daily living, including:

- Combing hair independently
- Reaching overhead without significant pain
- Dressing independently
- Improved grooming activities
- Reduced difficulty in lifting light objects
- Improved ability to sleep comfortably in the supine position

Postural Improvement

Postural assessment showed improvement in forward head posture, rounded shoulders, and thoracic kyphosis. Cervical alignment and shoulder positioning improved following rehabilitation.

Overall Outcome

The patient tolerated the rehabilitation program well, with no adverse events reported during treatment. Significant improvements were observed in pain, shoulder mobility, cervical mobility, posture, muscle performance, and overall functional independence.

Postural assessment showed improvement in forward head posture, rounded shoulders, and thoracic

kyphosis. Cervical alignment and shoulder positioning improved following rehabilitation.

DISCUSSION

Ankylosing spondylitis (AS) is a chronic inflammatory disease that primarily affects the axial skeleton, resulting in pain, progressive stiffness, reduced spinal mobility, and postural abnormalities. Although shoulder involvement is recognized in patients with AS, bilateral adhesive capsulitis is relatively uncommon and can lead to marked functional impairment by limiting upper-limb mobility and activities of daily living. [1,2]

The patient in the present case exhibited classical clinical features, including bilateral shoulder pain, restricted shoulder range of motion, cervical stiffness, forward head posture, increased thoracic kyphosis, and difficulty performing overhead activities. These findings are consistent with previous studies reporting that inflammatory changes and prolonged joint stiffness in AS can significantly reduce functional capacity and quality of life. [3]

A structured physiotherapy rehabilitation program consisting of pain-relieving modalities, joint mobilization, therapeutic exercises, strengthening, posture correction, and a home exercise program resulted in improvement in pain, shoulder mobility, cervical mobility, posture, and functional independence. Similar findings have been reported in previous studies, which demonstrated that comprehensive physiotherapy is effective in improving joint mobility, reducing pain, and enhancing functional outcomes in patients with ankylosing spondylitis and adhesive capsulitis. [4,5]

Postural correction and regular mobility exercises played an important role in improving cervical alignment and thoracic posture. Improvement in overhead reaching, grooming, dressing, and other activities of daily living indicated meaningful functional recovery following rehabilitation. These findings support current evidence recommending early physiotherapy intervention as an essential component of conservative management in patients with AS and shoulder dysfunction. [6]

This case highlights the importance of individualized physiotherapy rehabilitation in patients presenting

with bilateral adhesive capsulitis associated with ankylosing spondylitis. A multidisciplinary approach involving medical management and structured physiotherapy may improve clinical outcomes and quality of life.

Limitations

This report describes the outcome of a single patient; therefore, the findings cannot be generalized to all individuals with ankylosing spondylitis. Larger studies are required to further evaluate the effectiveness of physiotherapy rehabilitation in similar cases.

CONCLUSION

This case report demonstrates that a structured physiotherapy rehabilitation program can play an important role in the management of bilateral adhesive capsulitis associated with ankylosing spondylitis. A comprehensive treatment approach incorporating pain-relieving modalities, joint mobilization, therapeutic exercises, postural correction, strengthening exercises, and a home exercise program resulted in reduced pain, improved shoulder and cervical mobility, enhanced posture, and better functional independence. The patient showed improvement in activities of daily living, including overhead reaching, dressing, and combing hair. Early identification and individualized physiotherapy rehabilitation may help prevent further functional deterioration and improve the overall quality of life in patients with ankylosing spondylitis presenting with shoulder involvement. Further studies involving larger sample sizes are recommended to support these findings.

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Patient Consent Statement

Written informed consent was obtained from the patient for publication of this case report. The patient was informed about the purpose of publication, and

all personal identifiers have been removed to maintain confidentiality.

Ethical Considerations

This case report was prepared in accordance with the ethical principles for clinical case reporting. Patient privacy and confidentiality were maintained throughout the preparation of the manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Author Contributions

Anirudha J. Kharat: Patient assessment, physiotherapy intervention, data collection, literature review, manuscript preparation, and final manuscript drafting.

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