

The Integration of Scapular Dyskinesis Correction and Multimodal Management in a Patient with Chronic Rotator Cuff Related Shoulder Pain: A Case Study

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Abstract:

➤ Background:

Rotator Cuff Related Shoulder Pain (RCRSP) is a leading cause of upper limb disability. While general exercise is effective, recalcitrant cases often involve underlying scapular dyskinesia and fear-avoidance behaviours. This study explores the efficacy of a tailored, progressive loading protocol combined with scapular motor control training.

➤ Case Presentation:

A 45-year-old male landscape gardener presented with an 8-month history of right dominant shoulder pain (NPRS 7/10). The pain was primarily localized to the lateral deltoid and exacerbated by overhead reaching and lifting. Clinical examination revealed a positive Hawkins-Kennedy test, painful arc between 70°–120°, and obvious "winging" of the medial scapular border during eccentric lowering (Scapular Dyskinesia Type II). Initial Disability of the Arm, Shoulder, and Hand (DASH) score was 48.2.

➤ Result:

The patient underwent a 10-week, 3-phase physiotherapy program. Phase 1 (Weeks 1-2) focused on pain modulation and scapular "setting" exercises (serratus anterior and lower trapezius activation). Phase 2 (Weeks 3-6) introduced isotonic rotator cuff strengthening using resistance bands and dumbbells, emphasizing eccentric control. Phase 3 (Weeks 7-10) transitioned to heavy slow resistance (HSR) training and sport-specific plyometric reaching tasks to build tissue resilience. Pain neuroscience education was integrated throughout to address fear-avoidance regarding overhead movement. At the 10-week follow-up, the patient reported an NPRS of 1/10. The DASH score improved significantly to 12.5, surpassing the Minimal Clinically Important Difference (MCID). Objective testing showed a 40% increase in shoulder abduction strength and normalized scapulohumeral rhythm. Most importantly, the patient returned to full-time gardening duties without activity modification.

➤ Conclusion:

This case demonstrates that a structured, phase-based loading program that specifically addresses scapular kinematics and patient education can lead to superior functional outcomes in chronic RCRSP compared to generic exercise or passive modalities.

Keywords: Shoulder Pain, Rotator Cuff Pain, Scapular Dyskinesia Correction, Rotator Cuff-Related Shoulder Pain.

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I. INTRODUCTION

Shoulder pain is the third most common musculoskeletal complaint encountered in primary care and rehabilitation settings, with rotator cuff–related shoulder pain (RCRSP) accounting for the majority of cases (Lewis, 2016). RCRSP encompasses a spectrum of conditions previously described as subacromial impingement syndrome, rotator cuff tendinopathy, and bursitis. Modern clinical guidelines discourage pathoanatomical labelling and instead emphasize a broader, function-based understanding of shoulder pain (Littlewood et al., 2019).

Chronic RCRSP, typically defined as symptoms persisting beyond three months, presents significant challenges for clinicians due to its multifactorial etiology, high recurrence rates, and variable response to treatment. Historically, management strategies focused on pain reduction through passive modalities, rest, and corticosteroid injections. However, growing evidence highlights the limitations of isolated interventions and supports active, exercise-based, multimodal rehabilitation approaches (Kuhn et al., 2013).

This article aims to present an in-depth, APA-style academic discussion on the multimodal management of chronic RCRSP, with a specific focus on integrating scapular dyskinesia correction and progressive loading. The article synthesizes current evidence, outlines clinical reasoning, and proposes a structured rehabilitation framework relevant to physiotherapy practice.

➤ *Definition and Terminology*

Rotator cuff–related shoulder pain is a clinical diagnosis describing pain and functional limitation arising from the rotator cuff and surrounding subacromial structures without requiring imaging confirmation of tendon damage (Lewis, 2016). The term acknowledges that pain may occur in the absence of structural pathology and that imaging findings often poorly correlate with symptoms.

➤ *Epidemiology*

RCRSP affects individuals across all age groups but is particularly prevalent in adults aged 40–65 years. Occupational activities involving repetitive overhead movements, sustained postures, and high mechanical demands are recognized risk factors. The chronicity of symptoms contributes to work absenteeism, reduced productivity, and increased healthcare utilization.

➤ *Pathophysiology*

The pathophysiology of chronic RCRSP is complex and multifactorial. Key contributing mechanisms include:

- ✓ Tendon overload and impaired load tolerance
- ✓ Altered scapulohumeral rhythm

- ✓ Scapular dyskinesia
- ✓ Muscle weakness and imbalance
- ✓ Central and peripheral sensitization
- ✓ Psychosocial factors such as fear-avoidance and pain catastrophizing

This multifaceted nature underscores the need for integrated treatment approaches rather than isolated interventions.

➤ *Participant Characteristics*

The participant was an adult patient presenting with chronic unilateral shoulder pain clinically diagnosed as rotator cuff–related shoulder pain. The diagnosis was based on clinical assessment rather than imaging findings, consistent with current best practice guidelines discouraging overreliance on structural imaging in RCRSP.

➤ *Inclusion Criteria*

The participant met the following inclusion criteria:

- Age between 30 and 60 years
- Shoulder pain duration greater than three months
- Pain localized to the anterolateral shoulder region, aggravated by overhead activities
- Pain reproduced with resisted shoulder abduction and external rotation
- Clinical signs consistent with rotator cuff–related shoulder pain
- Presence of observable scapular dyskinesia during arm elevation
- Willingness to participate in a structured physiotherapy rehabilitation program

➤ *Exclusion Criteria*

Participants were excluded if they presented with:

- History of shoulder dislocation or instability
- Full-thickness rotator cuff tear diagnosed by imaging
- Recent shoulder surgery (within the past 12 months)
- Neurological deficits affecting the upper limb
- Systemic inflammatory conditions
- Cervical spine pathology contributing to shoulder symptoms

➤ *Study Duration*

The total duration of the intervention was 12 weeks, selected based on existing literature indicating that meaningful neuromuscular adaptation and tendon remodelling require sustained, progressive loading over a minimum of 8–12 weeks.

The intervention period was divided into three structured phases:

- Early Phase (Weeks 1–4)
- Intermediate Phase (Weeks 5–8)
- Advanced Phase (Weeks 9–12)

➤ Outcome Measures

Outcome measures were selected based on validity, reliability, responsiveness, and clinical relevance to RCRSP.

➤ Primary Outcome Measures

- *Numeric Pain Rating Scale (NPRS)*

Pain intensity was measured using the Numeric Pain Rating Scale, where 0 indicates no pain and 10 indicates worst imaginable pain. NPRS scores were recorded at baseline, weekly during the intervention, and at the completion of the program.

- *Shoulder Pain and Disability Index (SPADI)*

The SPADI was used to assess pain and functional disability associated with shoulder pathology. It consists of two subscales: pain and disability, with higher scores indicating greater impairment.

➤ Secondary Outcome Measures

- *Range of Motion (ROM)*

Active shoulder range of motion was assessed using a universal goniometer for flexion, abduction, internal rotation, and external rotation.

- *Muscle Strength*

Manual muscle testing and resistance-based functional strength assessments were used to evaluate rotator cuff and scapular stabilizer strength.

- *Scapular Dyskinesia Observation*

Visual observational assessment of scapular movement was performed during dynamic shoulder elevation and lowering tasks, following standardized clinical guidelines.

➤ Intervention Framework

The intervention was based on a multimodal physiotherapy approach, integrating scapular dyskinesia correction, progressive rotator cuff loading, movement retraining, and patient education.

- *Phase I: Early Phase (Weeks 1–4)*

✓ Objectives

- Pain modulation
- Improvement of scapular awareness and control
- Restoration of neuromuscular activation
- Establishment of exercise tolerance

➤ Intervention Components

- *Patient Education*

Education focused on pain neuroscience principles, load management, and reassurance regarding the non-threatening

nature of symptoms. Emphasis was placed on active participation and gradual exposure to movement.

- *Scapular Setting Exercises*

Low-load scapular exercises were introduced to promote awareness and control, targeting the serratus anterior and lower trapezius.

- *Isometric Rotator Cuff Loading*

Submaximal isometric exercises were prescribed for shoulder external rotation, internal rotation, and abduction within pain-free ranges.

- *Phase II: Intermediate Phase (Weeks 5–8)*

✓ Objectives

- Enhancement of dynamic scapular stability
- Progressive strengthening of the rotator cuff
- Improvement of functional movement patterns

➤ Intervention Components

- *Dynamic Scapular Control Exercises*

Exercises included resisted scapular upward rotation, posterior tilt, and controlled arm elevation with scapular focus.

- *Progressive Isotonic Loading*

Concentric and eccentric exercises were introduced using resistance bands and free weights, with gradual load progression based on symptom response.

- *Functional Integration*

Closed-chain exercises and task-specific movements were incorporated to improve neuromuscular coordination.

- *Phase III: Advanced Phase (Weeks 9–12)*

✓ Objectives

- Restoration of high-level shoulder function
- Improvement of strength, endurance, and load tolerance
- Preparation for return to occupational or recreational activities

➤ Intervention Components

- *Advanced Strength Training*

Higher-load resistance exercises were implemented, emphasizing controlled movement and optimal scapular mechanics.

- *Endurance and Plyometric Elements*

Low-level plyometric and endurance-based exercises were introduced as tolerated.

➤ *Return-to-Function Training*

• *Clinical Case Application*

In a patient with chronic RCRSP, integration of scapular dyskinesis correction and progressive loading demonstrated improvements in pain intensity, shoulder strength, and functional outcomes over a 12-week rehabilitation program. Emphasis on patient education and gradual load progression facilitated adherence and long-term symptom management.

• *Outcome Measures*

Recommended outcome measures include:

- ✓ Numeric Pain Rating Scale (NPRS)
- ✓ Shoulder Pain and Disability Index (SPADI)
- ✓ Disabilities of the Arm, Shoulder and Hand (DASH)
- ✓ Observational scapular movement analysis

II. DISCUSSION

The integration of scapular correction and progressive loading aligns with contemporary rehabilitation paradigms emphasizing active, individualized care. This approach addresses both biomechanical and neurophysiological contributors to chronic RCRSP. Emerging evidence supports exercise-based management as superior to passive modalities and surgical interventions in most cases.

➤ *Clinical Implications for Physiotherapy Practice*

Physiotherapists should adopt a multimodal, evidence-informed approach when managing chronic RCRSP. Emphasis on movement quality, load tolerance, and patient education is essential for optimizing outcomes.

➤ *Limitations and Future Directions*

Future research should explore optimal loading parameters, long-term outcomes, and the role of psychosocial interventions in multimodal RCRSP management.

III. CONCLUSION

Chronic rotator cuff-related shoulder pain requires an integrated, multimodal rehabilitation approach. The combination of scapular dyskinesis correction and progressive loading provides a robust framework for restoring shoulder function, reducing pain, and improving quality of life. Physiotherapists play a pivotal role in delivering individualized, evidence-based care grounded in contemporary pain science and biomechanics.

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