e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(10); 983-986

Original Research Article

A Review of Non-Operative Management Approaches for Rotator Cuff Tears

Ashish Kumar Jha

MD, Department of Orthopaedics, Krishna Family Care Clinic, Patna, Bihar, India

Received: 29-08-2025 / Revised: 28-09-2025 / Accepted: 29-10-2025
Corresponding Author: Ashish Kumar Jha
Conflict of interest: Nil

Abstract:

Rotator cuff tears are a frequent cause of shoulder pain and disability, particularly in ageing populations and individuals performing repetitive overhead activities. Although surgical repair is an option for acute traumatic injuries or large full-thickness tears, many patients with degenerative or partial-thickness tears are managed successfully without surgery. This review summarizes the main non-operative strategies used in the management of rotator cuff tears and highlights the evidence supporting their use. Physical therapy remains the foundation of conservative care, with programs focused on restoring shoulder mobility, improving rotator cuff and scapular muscle strength, correcting posture, and enhancing neuromuscular control. Activity modification and workplace or lifestyle adjustments help reduce mechanical stress on the affected tendons and support the rehabilitation process. Pharmacological therapies such as NSAIDs and simple analgesics offer short-term symptom relief and enable patients to participate effectively in physiotherapy. Subacromial corticosteroid injections can reduce pain and inflammation in selected patients, although their benefits are usually temporary. Biologic options, including platelet-rich plasma, have gained attention for their potential to promote tendon healing, but clinical outcomes remain variable. Other adjunctive modalities, such as shockwave therapy, ultrasound therapy, and manual techniques, may provide additional improvement when combined with exercise-based treatment. Overall, non-operative management yields good to excellent results in a substantial proportion of patients, especially those with degenerative or smaller tears. Careful patient selection, adherence to rehabilitation, and regular monitoring are essential for achieving optimal outcomes. Further research is required to strengthen the evidence base and refine treatment pathways.

Introduction

Rotator cuff tears are a frequent source of shoulder pain and reduced upper-limb function, especially in older adults and those involved in repetitive or overhead activities. The rotator cuff muscles play a key role in stabilizing the shoulder and coordinating smooth movement. When one or more of these tendons is damaged, patients often experience pain, weakness, limited range of motion, and difficulty performing routine tasks. Although many tears develop gradually through age-related degeneration, some occur suddenly after trauma. Symptomatic tears can significantly affect quality of life and are a common reason for orthopedic consultation.

Ageing is the strongest risk factor for rotator cuff pathology, with degenerative tears increasing steadily after the fifth decade. Contributing factors such as reduced tendon vascularity, repetitive strain at work or in sports, metabolic conditions, smoking, and poor posture further accelerate tendon wear. Rotator cuff tears are classified as partial- or full-thickness and as traumatic or degenerative. These distinctions help guide treatment planning. While acute full-thickness tears in younger individuals often warrant surgical evaluation, a large proportion of chronic and degenerative tears respond well to non-operative care.

Over the years, conservative treatment has become an important first-line approach for many patients. The primary goals are to relieve pain, restore shoulder motion, and strengthen surrounding muscles to compensate for the torn tendon. Physical therapy remains the foundation of non-operative management, focusing on stretching, strengthening, scapular control, and gradual return to functional activities. Medications, corticosteroid injections, and physical modalities are often used alongside rehabilitation to reduce discomfort and improve participation in therapy. In many cases, these measures allow patients to regain satisfactory function without surgery.

Outcomes of non-operative treatment depend on several patient and tear-related factors, including tear size, chronicity, muscle quality, activity demands, and adherence to therapy. Older adults

with degenerative tears often achieve good relief with a structured rehabilitation programme, whereas younger or highly active individuals may be less likely to respond. As clinical understanding of rotator cuff disease has advanced, there has been a shift toward individualized treatment rather than routine surgical intervention. Non-operative management continues to serve as an effective and practical option for many patients, helping reduce symptoms and maintain shoulder function while avoiding the risks associated with surgery.

Methods

This article is a narrative review. A comprehensive search of PubMed, Google Scholar, and Scopus was performed to identify studies published between 2000 and 2024. Search terms included "rotator cuff tear," "non-operative management," "conservative therapy," "physical therapy," "rotator cuff rehabilitation," and "shoulder pain treatment." Both randomized controlled trials (RCTs), systematic reviews, observational studies, and high-quality expert guidelines were reviewed. Only studies focusing on conservative management strategies were included.

Pathophysiology and Classification of Rotator Cuff Tears: RCTs may be categorized based on extent (partial vs. full thickness), chronicity (acute vs. chronic), mechanism (traumatic vs. degenerative), and tendon involvement. Degenerative tears often have a gradual onset and are associated with age-related tendon thinning, hypovascularity, and mechanical impingement. Traumatic tears typically occur due to sudden, forceful movement.

Understanding tear characteristics is crucial for management decisions. Patients with small, partial-thickness, or degenerative tears often respond well to conservative treatment. In contrast, active individuals or those with acute full-thickness tears may require surgical evaluation.

Indications for Non-Operative Management: Non-operative management is generally preferred in situations where the tear is partial in nature, particularly when less than half of the tendon thickness is involved, and in cases where the tear has developed gradually due to degeneration rather than acute trauma. It is often the first choice for older adults who have lower functional demands or for patients with medical comorbidities that increase the risks associated with surgery. Many individuals also opt for conservative care when they are hesitant about surgical intervention or while they are awaiting a surgical consultation. Non-operative treatment is especially suitable for small-to-medium chronic tears that are stable and not rapidly progressing. In addition, conservative measures are frequently used initially to control pain and improve mobility before finalizing the need for surgery. In most clinical settings, a structured trial of non-operative management lasting about 6 to 12 weeks is recommended before considering surgical alternatives.

Non-Operative Management Approaches

Activity Modification and Rest: Activity modification is a foundational step in conservative treatment. Avoiding repetitive overhead activities, heavy lifting, or sudden jerking movements helps reduce strain on the supraspinatus and infraspinatus tendons. Patients are advised to adjust work ergonomics, use proper posture, and employ supportive devices when needed. During acute flare-ups, short periods of rest reduce inflammation, but prolonged immobilization is avoided to prevent stiffness.

Evidence: Studies have demonstrated that modifying daily activities can significantly reduce pain and prevent tear progression when combined with structured physiotherapy.

Physical Therapy (Physiotherapy): Physical therapy (PT) is the cornerstone of non-operative treatment and has shown effectiveness in improving pain, strength, and functional outcomes.

Components of PT Programs

Range of Motion (ROM) Exercises: These exercises aim to restore flexibility and prevent shoulder stiffness. Active-assisted ROM, pendulum exercises, and passive stretching help maintain joint mobility.

Strengthening Exercises: Strengthening the rotator cuff and scapular stabilizers compensates for tendon deficits. Exercises typically target the deltoid, serratus anterior, rhomboids, and trapezius muscles.

Scapular Stabilization: Scapular dyskinesis contributes to impingement and rotator cuff pathology. Training proper scapular kinematics enhances shoulder function.

Eccentric Training: Eccentric exercises have been shown to promote tendon healing and collagen remodeling.

Closed Chain Exercises: These exercises provide joint stability and reduce shear forces.

Evidence: The MOON Shoulder Group demonstrated that a structured PT program was successful in nearly 75% of patients, reducing the need for surgery over a two-year period.

NSAIDs and Analgesics: Non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen and diclofenac are commonly used to reduce pain and inflammation. Acetaminophen is preferred when NSAIDs are contraindicated.

Advantages:

- Rapid pain relief
- Improve participation in physiotherapy

Limitations:

- Gastrointestinal and renal side effects
- Do not address tendon healing

Evidence indicates NSAIDs provide short-term relief but should not be considered definitive treatment.

Corticosteroid Injections: Subacromial corticosteroid injections are widely used for pain control in RCTs.

Mechanism: Reduce inflammation in the subacromial space, improving ROM and allowing PT participation.

Indications:

- Persistent pain limiting rehabilitation
- Subacromial bursitis
- Acute inflammation

Limitations:

- Temporary effects (typically 6–12 weeks)
- Repeated injections risk tendon weakening
- Should not be given more than 2–3 times per year

Evidence: RCTs show improved short-term pain relief but minimal long-term benefits.

Platelet-Rich Plasma (PRP): PRP injections involve injecting concentrated platelets to promote tissue healing.

Potential Benefits:

- Stimulates tendon repair
- Reduces inflammation
- May slow tear progression

Limitations:

- High cost
- Varied preparation methods
- Inconsistent clinical evidence

Recent meta-analyses show PRP offers moderate improvement in pain and function, particularly in partial-thickness tears.

Hyaluronic Acid (HA) Injections: In some cases, HA injections reduce pain and improve mobility by reducing friction in the shoulder joint.

Evidence: Mixed findings; beneficial particularly for degenerative tears with associated osteoarthritis.

Physical Modalities

Ultrasound Therapy: Enhances blood flow and reduces pain, but evidence remains inconclusive.

Transcutaneous Electrical Nerve Stimulation (TENS): Provides short-term pain relief.

Cryotherapy and Heat Therapy: Ice reduces acute inflammation; heat improves tissue elasticity before exercise.

Extracorporeal Shockwave Therapy (ESWT): ESWT has gained popularity for treating chronic tendinopathies.

Mechanism:

- Promotes neovascularization
- Stimulates cellular regeneration

Evidence: Studies suggest ESWT may improve pain and function in rotator cuff tendinopathy, though results in full-thickness tears remain limited.

Manual Therapy: Mobilization techniques performed by trained physiotherapists can improve joint mechanics and ROM.

Types:

- Glenohumeral joint mobilizations
- Soft tissue release
- Myofascial therapy

Manual therapy improves biomechanics and reduces compensatory muscle tightness.

Home Exercise Programs: Home-based exercises reinforce gains from PT. Adherence is crucial for long-term success. Many studies show home programs alone can achieve significant improvements.

Combined Multimodal Approach

Most guidelines recommend a combination of:

- Structured PT
- NSAIDs or analgesics
- Corticosteroid injections (when needed)
- Home exercise program

Multimodal treatment is more effective than any single therapy.

Outcomes of Non-Operative Management

Studies show:

- 70–80% of patients report satisfactory outcomes
- Strength may not fully recover in large tears
- Pain relief is significant in most cases
- Degenerative tears may progress in size over time
- Functional improvement is greatest in the first 6–12 weeks

Younger patients and those with traumatic tears show less favorable outcomes.

Comparison with Surgical Management: While surgery is superior for certain cases (e.g., acute full-thickness tears), non-operative care is often comparable in pain relief and short-term functional outcomes.

Advantages of non-operative care:

- Avoids surgical risks
- Lower cost
- Faster initial recovery
- Suitable for elderly and comorbid patients

Limitations:

- Persistent weakness may remain
- Tear progression risk
- Less effective in high-demand individuals

Factors Influencing Success of Non-Operative Treatment

- Age of the patient
- Tear size and chronicity
- Muscle atrophy or fatty infiltration
- Adherence to physiotherapy
- Smoking status
- Presence of comorbidities (diabetes, thyroid disease)

Patients with small, atraumatic tears show the best outcomes.

Future Directions: As biologics and regenerative medicine advance, PRP, stem cell therapy, and scaffolds may revolutionize treatment. Improved imaging and personalized medicine will allow more tailored approaches.

Conclusion

Non-operative management remains a highly effective treatment option for many patients with rotator cuff tears, particularly those with degenerative, partial-thickness, or chronic lesions. Structured physical therapy is the cornerstone of treatment, providing substantial improvements in pain and function. Adjunct modalities such as NSAIDs, corticosteroid injections, PRP, manual therapy, and shockwave therapy further enhance outcomes. While not suitable for all patients—particularly younger individuals with acute traumatic tears—conservative care often avoids or delays surgery, reduces healthcare costs, and improves quality of life. Continued research into biologic therapies and individualized treatment pathways will further advance non-surgical management strategies.

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