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INTEGRATIVE MANAGEMENT OF MASSIVE ROTATOR CUFF TEARS IN RHEUMATOID ARTHRITIS: A CASE-BASED REVIEW OF ANSA MARMA AND SNAYU DUSHTI

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ABSTRACT

Background: Chronic shoulder disability in the geriatric population is frequently precipitated by massive rotator cuff failures, which are exacerbated in the presence of systemic inflammatory conditions like Rheumatoid Arthritis (RA). While modern orthopaedics focuses on mechanical wear and age-centric degeneration, Ayurveda provides a deeper pathophysiological understanding through the concepts of Ansa Marma Dushti and Snayu Dushti, where systemic inflammation acts as a catalyst for structural collapse. **Objective:** This article seeks to delineate the integrative management of massive rotator cuff tears by correlating modern radiological evidence and cadaveric structural insights with the Ayurvedic principles of *Vatavyadhi* and *Dhatu Kshaya*. **Discussion:** Clinical observations from a 68-year-old female patient with a long-standing history of RA and Hypertension revealed a near-complete (>2 cm) supra-infraspinatus rupture with severe muscle atrophy. The highly aggressive systemic inflammation, evidenced by Anti-CCP levels >195.6 U/ml and reactive RA factor, directly correlates with the Ayurvedic notion of chronic Vata-aggravation, which depletes the *Snayu* (tendons) and *Asthi* (bones). Cadaveric evidence further identifies a "critical zone" of hypovascularity that mirrors the poor healing potential seen in RA patients. While conservative management using *Vatashamana* therapies—such as Sinchnad

Guggulu and Maharasnadi Kwath—aimed to control systemic inflammation, the structural magnitude of the tear necessitated a surgical referral for functional restoration. **Conclusion:** The presence of Rheumatoid Arthritis transforms a mechanical rotator cuff tear into a complex systemic pathology. Synergizing Rachana Sharir insights with advanced imaging provides a robust framework for managing such cases. An integrative approach is paramount to balance inflammatory control (*Shamana*) with the structural requirements of surgical intervention in massive *Ansa Marma* injuries.

KEYWORDS: Supraspinatus Tendon Rupture; Glenohumeral Instability; *Ansa Marma* Pathology; *Snayu Dushti*; Integrative Orthopaedics; Rheumatoid Arthritis; Geriatric Musculoskeletal Dysfunction.

INTRODUCTION

The shoulder complex, known for its unparalleled range of motion, is also uniquely susceptible to a spectrum of musculoskeletal ailments that significantly diminish operational capacity and life quality in both the elderly and the physically rigorous populations. Statistics reveal a compelling correlation between advancing age and the incidence of rotator cuff pathologies, with approximately 25% of the geriatric demographic exhibiting some degree of functional or structural impairment. The rotator cuff itself is an intricate musculotendinous architecture consisting of four pivotal muscles—the supraspinatus, infraspinatus, subscapularis, and teres minor. Collectively, these units function as the primary dynamic stabilizers of the glenohumeral joint, ensuring that the humeral head remains centered within the glenoid fossa during complex upper limb maneuvers.

In the realm of Ayurvedic medicine, the anatomical region of the shoulder is meticulously categorized under **Ansa Marma** and **Ansa Sandhi**. Classical texts define this area as a **Vaikalyakara Marma**, a designation reserved for vital anatomical points where trauma or structural disharmony results in permanent or temporary disability. The clinical manifestations of rotator cuff injuries—ranging from restricted mobility to chronic pain—align seamlessly with the Ayurvedic descriptions of *Marma Abhighata* (trauma to vital points). Establishing a scholarly bridge between these two diagnostic paradigms offers a multi-dimensional perspective, paving the way for integrative management strategies that leverage the rehabilitative strengths of Ayurveda alongside modern surgical insights.

Anatomical Considerations of the Rotator Cuff

Understanding the structural nuances of the rotator cuff is fundamental to diagnosing the severity of a tear. This complex acts as a cohesive sleeve that envelopes the humeral head, facilitating rotation and abduction while resisting the upward pull of the deltoid.

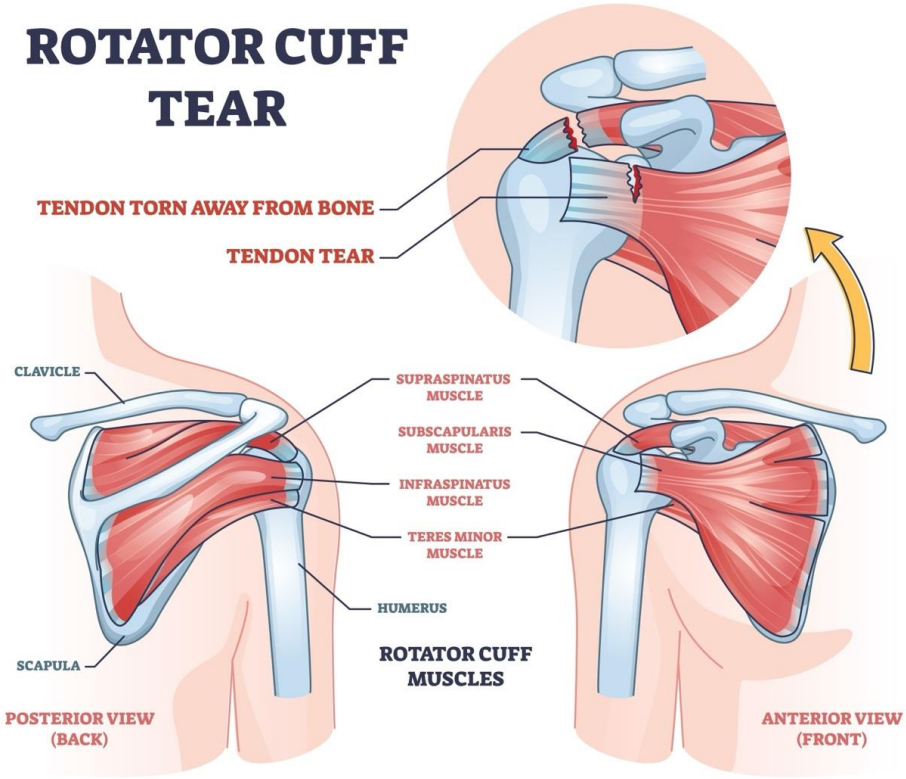


Table 1: Functional Anatomy and Clinical Vulnerability.

Muscle	Primary Physiological Function	Pathological Significance in Injury
Supraspinatus	Essential for the initiation of arm abduction.	Identified as the most frequent site of rupture due to its location in the subacromial space.
Infraspinatus	Facilitates external rotation of the humerus.	Often prone to degenerative thinning and partial-thickness tears in chronic cases.
Subscapularis	Executes internal rotation and provides anterior stability.	Less frequent involved in isolated tears; typically damaged in complex, massive ruptures.
Teres Minor	Assists in external rotation and joint stabilization.	Rarely the primary site of injury; usually maintains structural integrity unless severe trauma occurs.

From a *Rachana Sharir* perspective, these muscles and their respective tendons represent the **Snayu** (ligaments/tendons) and **Peshi** (muscles) that protect the *Ansa Sandhi*. The supraspinatus, in particular, passes through a narrow osteofibrous tunnel, making it the most vulnerable "target" for mechanical impingement and subsequent *Snayu Dushti* (tendon pathology).

Clinical Features: The Modern Diagnostic Lens

The clinical presentation of a rotator cuff tear is often multifaceted, varying based on whether the onset is acute (trauma-related) or chronic (degenerative). Patients typically report a deep, aching pain localized to the lateral aspect of the shoulder, which frequently exacerbates during nocturnal hours or when resting on the affected side.

Key clinical observations often include

- **Mechanical Limitations:** Significant difficulty in performing overhead activities, such as reaching or lifting.
- **Functional Weakness:** A marked reduction in the strength of abduction and external rotation, which may progress to visible muscle atrophy in chronic, massive tears.
- **Crepitus:** Audible or palpable clicking sounds during movement, indicating irregular tendon sliding or joint effusion.

For a definitive diagnosis, **Magnetic Resonance Imaging (MRI)** remains the gold standard. It provides high-resolution visualization of the soft tissues, allowing clinicians to quantify the dimensions of the tear, assess the degree of muscle retraction, and identify associated pathologies such as subacromial bursitis or labral tears. In cases like the 68-year-old patient referenced in this study, MRI is indispensable for differentiating between a simple inflammatory condition and a massive, near-complete structural failure.

Physical Examination and Provocative Testing

A systematic physical examination is vital to correlate radiological findings with functional deficits. Several bedside tests have been developed to isolate specific components of the rotator cuff and assess subacromial impingement.

Table 2: Diagnostic Significance of Provocative Clinical Tests.

Test Name	Positive Finding	Diagnostic Clinical Significance
Neer's Test	Sharp pain elicited during passive forward flexion of the arm.	Indicates subacromial impingement of the supraspinatus tendon.
Hawkins-Kennedy Test	Pain triggered by forced internal rotation at 90 degrees of flexion.	Suggests entrapment of the tendon beneath the acromial arch.
Painful Arc Test	Maximum pain experienced between 60° and 120° of abduction.	Highly specific for supraspinatus pathology and subacromial bursitis.
Drop Arm Test	The patient is unable to lower the arm slowly and smoothly from an abducted position.	Suggests a significant or full-thickness rotator cuff rupture.

The presence of a positive **Drop Arm Test**, as observed in severe cases, is particularly alarming as it signals a total loss of the tendon's "pulley" function, often requiring an immediate shift from conservative management to surgical evaluation. When these findings are integrated with the Ayurvedic understanding of *Sandhi Vishlisht* (joint instability), a more profound picture of the patient's disability emerges, guiding a more.

Ayurvedic and Conceptual Framework

Acharya Sushruta, in his foundational anatomical treatises, meticulously classified the **Ansa Marma** as a **Vaikalyakara Marma** (a vital point where injury results in deformity or functional loss). The classical literature explicitly states.

अंसौ वैकल्यकरौ प्रोक्तौ तत्र पीडायुतं वपुः ।

भवत्यसंपूर्णकर्म तद्विकारेण जन्तुषु ॥ (सू. शा. ६/२७)३

Interpretation: The shoulder region (*Ansa*) serves as a critical vital center; any trauma or pathological disturbance here manifests as excruciating pain and a profound inability to perform upper limb activities. This ancient clinical observation finds a direct modern parallel in massive rotator cuff ruptures—where the structural integrity of the *Snayu* (tendons) is compromised, leading to the hallmark disability seen in geriatric patients with systemic inflammatory backgrounds like Rheumatoid Arthritis.

Table 3: Interdisciplinary Correlation of Shoulder Pathologies.

Ayurvedic Concept	Modern Pathological Correlation	Clinical Manifestations
Ansa Marma Dushti	Critical structural failure of the rotator cuff complex.	Intractable pain and comprehensive functional loss.

Snayu Dushti	Chronic tendinopathy or structural tendon degradation.	Joint stiffness, localized weakness, and impaired ROM.
Vatavyadhi	Neuro-musculoskeletal dysfunction driven by Vata.	Degenerative wasting and chronic neurogenic pain.
Ansa Sandhi Vishlisht	Glenohumeral joint instability following massive tears.	Reduced power and compromised joint stability.

Anatomical Vulnerability: Insights from Cadaveric Observation

Empirical evidence from cadaveric dissections provides a mechanical rationale for why the rotator cuff is particularly susceptible to failure in chronic conditions. The following structural insights highlight this vulnerability.

1. **Subacromial Congestion:** A constricted subacromial space acts as a mechanical bottleneck, predisposing the supraspinatus to repetitive impingement and friction.
2. **Tendon Atrophy:** Marked thinning of the distal supraspinatus tendon indicates a structural predisposition to degenerative, full-thickness ruptures.
3. **Conjoint Pathology:** Near the site of insertion, the merging of fibers from the supraspinatus and infraspinatus facilitates the progression of single tendon tears into multi-tendon massive defects.
4. **The Hypovascular "Critical Zone":** The discovery of a vascularly deficient region near the tendon's attachment explains the inherently poor healing potential, often categorized in Ayurveda as *Dhatu Kshaya* (tissue depletion) following *Vata* provocation.

Table 4: Synthesis of Cadaveric Evidence and Ayurvedic Concepts.

Observation	Clinical Implications	Ayurvedic Structural Correlation
Narrow Subacromial Space	Acute impingement and partial-thickness tears.	*Ansa Marma* sensitivity.
Distal Tendon Thinning	Propensity for spontaneous degenerative tears.	*Snayu Dushti*.
Conjoint Tendon Fusion	Rapid progression to massive clinical disability.	*Sandhi–Snayu* complex trauma.
Hypovascular "Critical Zone"	Degenerative failure and delayed recovery.	*Vata Prakopa* and *Dhatu Kshaya*.

DISCUSSION: Bridging Structural Anatomy and Systemic Disease

The etiology of rotator cuff failure is an interplay of repetitive mechanical stress, age-centric degeneration, and compromised micro-vascularity. These factors are significantly amplified in patients with Rheumatoid Arthritis, where systemic inflammation accelerates the degradation of *Snayu* (tendons). Cadaveric evidence serves to reinforce our understanding of the supraspinatus tendon's inherent fragility.

Clinical hallmarks—such as the painful arc syndrome, positive provocative maneuvers, and MRI evidence—correlate precisely with the classical definitions of *Ansa Marma Dushti*. This case demonstrates that an integrative approach, merging internal *Vatashamana* therapies with external *Snehana-Swedana* and modern physiotherapy, can offer substantial relief. However, in the presence of massive ruptures, understanding these anatomical boundaries is crucial for determining when surgical intervention must supplement Ayurvedic care.

Clinical Case Study: Management of Massive Rotator Cuff Tear in a Patient with Systemic Rheumatoid Arthritis

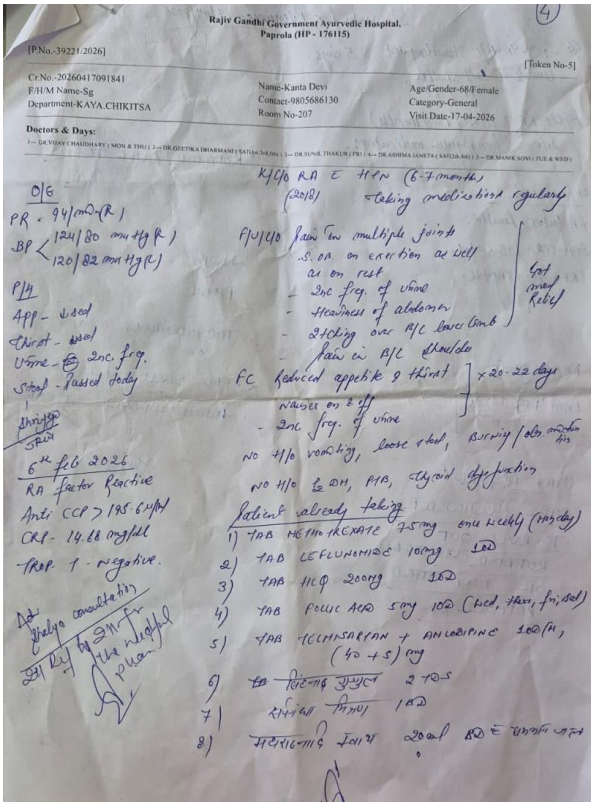
Introduction

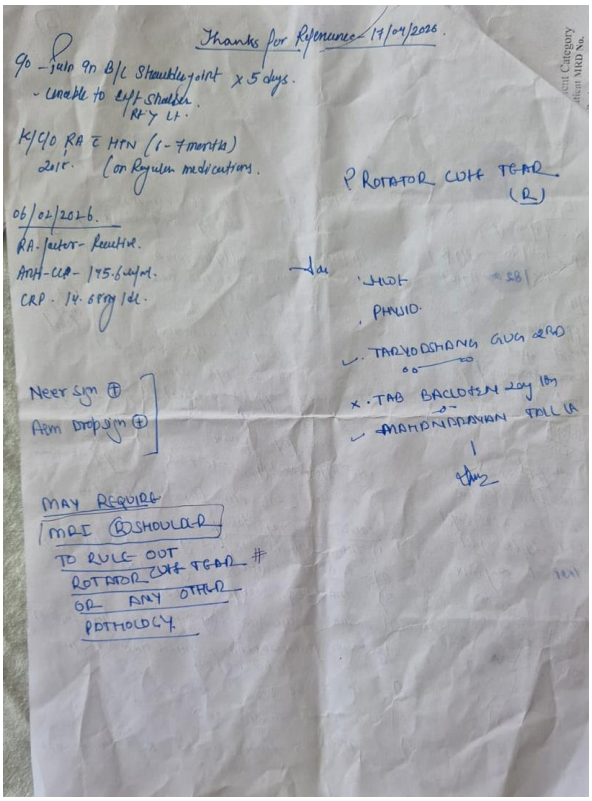
The management of musculoskeletal injuries becomes significantly more complex when superimposed on systemic inflammatory conditions. This case explores the clinical journey of a 68-year-old female patient presenting with acute-on-chronic shoulder pain, where long-standing Rheumatoid Arthritis (RA) and Hypertension (HTN) served as the systemic background for a severe mechanical injury.

Patient Profile & Clinical Presentation

The patient, a 68-year-old female, presented with a history of bilateral shoulder pain, which acutely worsened over five days. Key clinical observations included.

- **Functional Limitation:** An inability to lift the right shoulder.
- **Clinical Signs:** Positive **Neer's sign** and **Drop Arm sign**, both strongly suggestive of a significant rotator cuff pathology.
- **Systemic History:** Known case of Rheumatoid Arthritis and Hypertension for 6–7 months, under regular medication including Methotrexate, Leflunomide, and HCQ.





Diagnostic Investigations

The diagnostic approach integrated both biochemical markers and advanced imaging.

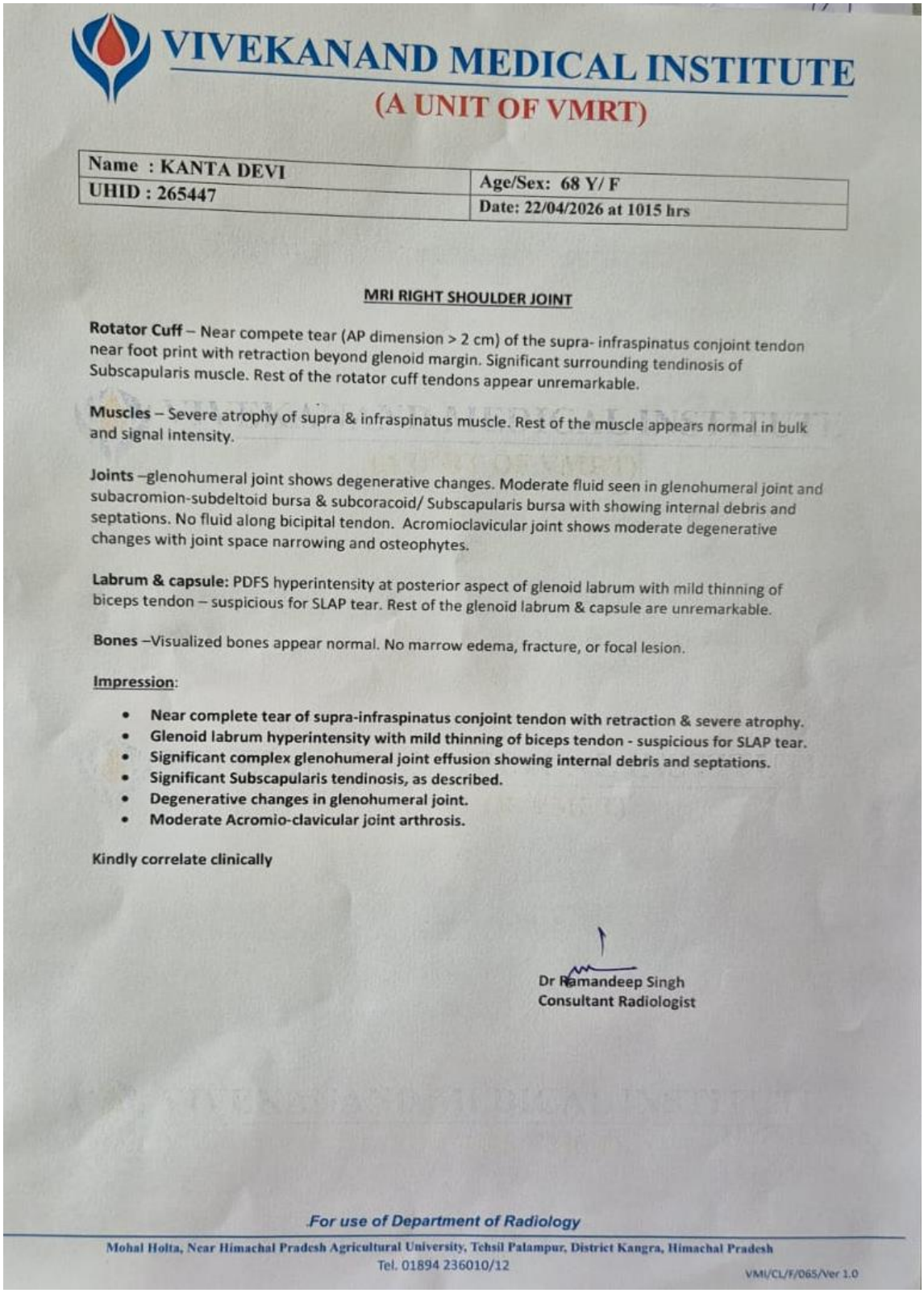
1. Laboratory Findings (Feb 2026).

- **RA Factor:** Reactive.
- **Anti-CCP:** >195.6 U/ml (Highly elevated, indicating aggressive RA).
- **CRP:** 14.68 mg/dL (Elevated inflammatory marker).

2. MRI Findings (April 2026)

An MRI of the right shoulder joint revealed critical structural damage.

- **Rotator Cuff:** A **near-complete tear (>2 cm)** of the supra-infraspinatus conjoint tendon with significant retraction beyond the glenoid margin.
- **Muscle Atrophy:** Severe atrophy of the supraspinatus and infraspinatus muscles, indicating the chronic nature of the tear.
- **Associated Pathologies:** Significant joint effusion, Subscapularis tendinosis, and degenerative changes in the glenohumeral joint. A suspicion of a **SLAP tear** was also noted.



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Name : KANTA DEVI	Age/Sex: 68 Y/ F
UHID : 265447	Date: 22/04/2026 at 1015 hrs

MRI RIGHT SHOULDER JOINT

Rotator Cuff – Near compete tear (AP dimension > 2 cm) of the supra- infraspinatus conjoint tendon near foot print with retraction beyond glenoid margin. Significant surrounding tendinosis of Subscapularis muscle. Rest of the rotator cuff tendons appear unremarkable.

Muscles – Severe atrophy of supra & infraspinatus muscle. Rest of the muscle appears normal in bulk and signal intensity.

Joints –glenohumeral joint shows degenerative changes. Moderate fluid seen in glenohumeral joint and subacromion-subdeltoid bursa & subcoracoid/ Subscapularis bursa with showing internal debris and septations. No fluid along bicipital tendon. Acromioclavicular joint shows moderate degenerative changes with joint space narrowing and osteophytes.

Labrum & capsule: PDFS hyperintensity at posterior aspect of glenoid labrum with mild thinning of biceps tendon – suspicious for SLAP tear. Rest of the glenoid labrum & capsule are unremarkable.

Bones –Visualized bones appear normal. No marrow edema, fracture, or focal lesion.

Impression:

- **Near complete tear of supra-infraspinatus conjoint tendon with retraction & severe atrophy.**
- **Glenoid labrum hyperintensity with mild thinning of biceps tendon - suspicious for SLAP tear.**
- **Significant complex glenohumeral joint effusion showing internal debris and septations.**
- **Significant Subscapularis tendinosis, as described.**
- **Degenerative changes in glenohumeral joint.**
- **Moderate Acromio-clavicular joint arthrosis.**

Kindly correlate clinically

Dr Ramandeep Singh
Consultant Radiologist

For use of Department of Radiology

Mohal Holta, Near Himachal Pradesh Agricultural University, Tehsil Palampur, District Kangra, Himachal Pradesh
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VMI/CL/F/065/Ver 1.0

Integrated Management Approach

The patient's treatment plan evolved through stages, beginning with conservative Ayurvedic management and transitioning toward surgical necessity.

- **Conservative/Ayurvedic Phase:** Initial management focused on controlling inflammation and pain using a combination of:
  - **Internal Medications:** *Sinchnad Guggul*, *Trayodashang Guggulu*, and *Maharasnadi Kwath*.
  - **External Application:** *Mahanarayan Taila*.
  - **Allopathic Vitals Control:** Continuation of anti-hypertensives (Telmisartan + Amlodipine) and RA-specific DMARDs.
- **Surgical Referral:** Upon reviewing the MRI results, which showed a near-complete tear with severe muscle atrophy, it was determined that conservative management alone would be insufficient for functional recovery. The patient was advised to visit a tertiary care center for **surgical management** (likely rotator cuff repair or reconstruction).

Clinical Discussion

This case highlights the "vicious cycle" of RA and mechanical joint failure. Chronic inflammation from RA can weaken tendinous structures, making them more susceptible to massive tears even with minimal trauma. The presence of **severe muscle atrophy** is a critical prognostic factor, as it often limits the success of simple primary repairs and may necessitate more complex surgical interventions or intensive long-term rehabilitation.

CONCLUSION

In geriatric patients with high systemic inflammatory markers (elevated Anti-CCP and CRP), shoulder pain should be investigated early with imaging like MRI. While Ayurvedic and conservative treatments provide excellent symptomatic relief and inflammatory control, structural failures like massive rotator cuff tears requires a multidisciplinary approach involving both medical and surgical expertise.

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