

Challenges in Rotator Cuff Tears on Preoperative MRI

Seul Ki Lee, St. Vincent's Hospital, The Catholic University of Korea

Introduction

Preoperative MRI plays a crucial role in diagnosing and planning treatment for rotator cuff tears. However, certain challenges arise when interpreting these images, potentially impacting diagnostic accuracy and treatment outcomes.

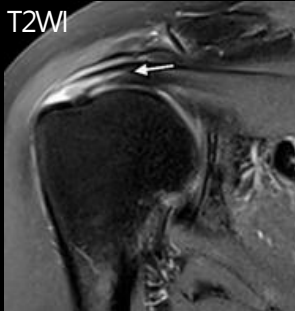
This poster presentation explores the delaminated tears, subscapularis tendon tears, and massive rotator cuff tears, highlighting the importance of accurate preoperative assessment for optimal surgical planning.

Delaminated Tears

Delaminated tears are characterized by a horizontal split in the rotator cuff tendon, typically affecting the supraspinatus or infraspinatus.

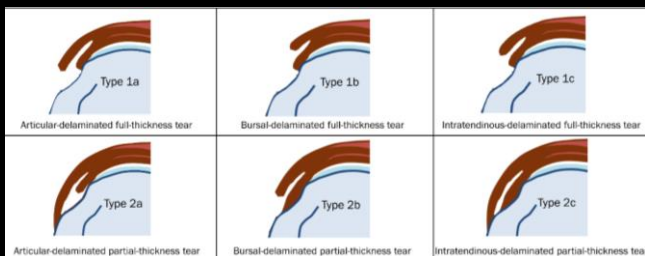
These tears are associated with poor functional and morphologic outcomes post-repair.

✓ Radiological Characteristics



Delaminated tears present as horizontal components of partial-thickness tears. As the tear progresses, it may manifest as either horizontal intrasubstantial splitting or differential retraction of the bursal and articular layers.

✓ Radiological Classification



Choo et al. using indirect MR arthrography
AJR Am J Roentgenol. 2015;204(2):360-366

✓ Clinical Importance

Accurate preoperative identification of delaminated tears is essential for selecting appropriate surgical repair techniques. Failure to recognize these tears may lead to suboptimal treatment strategies and compromised patient outcomes.

Subscapularis Tears

The subscapularis tendon's insertion on the lesser tuberosity poses significant challenges for visualization during arthroscopy. This complexity can lead to missed diagnoses, particularly in cases of partial-thickness tears.

✓ Classification for Subscapularis Tears

| Classification | Key Features | Clinical relevance |
|----------------|--|----------------------------------|
| Pfirschmann | Based on MRI | Useful for preoperative planning |
| Lafosse | Arthroscopic classification | Guides surgical approach |
| Yoo and Rhee | Combined imaging and arthroscopic findings | Comprehensive assessment |

Massive Rotator Cuff Tears

Massive rotator cuff tears (MRCTs) account for approximately 40% of all rotator cuff tears.

MRCTs pose unique challenges in treatment due to their size, tissue quality, and potential for irreparable damage. Determining the optimal treatment approach requires careful consideration of multiple factors.

✓ Arthroscopic Repair of MRCTs & Reparability

| MRI parameters | Key Features |
|-------------------|--|
| Tear size | Tear size ≥ 5 cm: bad prognostic sign |
| Muscle quality | SSP (stage ≥ 3) and ISP (stage ≥ 1) or tangent sign (+): bad prognostic sign |
| Tendon retraction | Patte grade ≥ 3 : bad prognostic sign |

Conclusion

An awareness of these potential pitfalls will help improve radiologists' diagnostic accuracy of rotator cuff pathology.

Knowledge of the aforementioned pathologies will allow the radiologist to understand the limitations of imaging studies to understand when to suggest further imaging in relation to the clinical question, as well as allow the clinician to optimize their imaging referral.