

MRI-Based Diagnosis of Subscapularis Tears Varies between Radiologists and Surgeons

Ali Ihsan KILIC¹, Javier Ardebol, Kassem Ghayyad², Theresa Pak³, Mariano E Menendez Furrer¹, Patrick J Denard³

¹Orthopedics and Traumatology, ²Rothman Orthopedic Institute, ³Oregon Shoulder Institute

INTRODUCTION:

Subscapularis (SSC) tears can be difficult to diagnose with magnetic resonance imaging (MRI). The purpose of this study is to compare radiologist and surgeon MRI interpretations of subscapularis tears against intraoperative arthroscopic examination.

METHODS: A retrospective review was conducted on prospectively maintained data on patients who underwent arthroscopic rotator cuff repair (ARCR) with and without SSC tears between 2011 and 2022. The radiologists' assessments of SSC integrity were extracted from the MRI reports. One high-volume fellowship-trained shoulder surgeon assessed all MRIs for the presence or absence of SSC tears. Radiologist and surgeon MRI-based assessments were compared against the diagnostic gold-standard (intraoperative arthroscopic examination) and classified according to the Lafosse classification. Sensitivity, specificity, positive and negative predictive values, accuracy were calculated.

RESULTS: A total of 1,090 patients were included for analysis, 839 with intraoperatively confirmed SSC tears (77%) and 251 without (23%). Radiologists diagnosed SSC tears with a sensitivity of 56.0% (470/839) and a specificity of 67.3% (169/251) via MRI, whereas the surgeon diagnosed SSC tears with a sensitivity of 71.4% (599/839) and a specificity of 78.1% (196/251). Overall, radiologists only correctly identify 56% of SSC tears whereas the shoulder surgeon correctly identified approximately 71.4% of tears. When considering arthroscopically confirmed tear size (i.e., intact, partial, full thickness-upper border, and complete), the radiologist diagnosis rates with MRI were 32.7%, 40.4%, 64.6%, and 78.3%, respectively; surgeon diagnosis rates were 21.9%, 52.7%, 81.9%, and 97.5%, respectively.

DISCUSSION AND CONCLUSION: In a community practice, radiologists miss approximately 50% of SSC tears. A shoulder surgeon with the benefit of clinical examination can detect a higher number, but still misses approximately 30% of tears on MRI. Accuracy increases as tears size since increases, with radiologists detecting 40.4% of partial tears and 78.3% of complete tears and a surgeon detecting 52.7% and 97.5% respectively. These findings call attention to avoiding overreliance on MRI reports for the diagnosis of subscapularis tears, and highlight the importance of careful routine intraoperative examination of tendon integrity.

Table 1. MRI Interpretative Results by Surgeon vs. Radiologist

	Radiologist	Surgeon	Chi's Kappa
Sensitivity	56.0% (470/839)	71.4% (599/839)	P<.001
Specificity	67.3% (169/251)	78.1% (196/251)	P<.001
Positive predictive value	62.2% (478/770)	61.8% (598/968)	P=.801
Negative predictive value	31.4% (168/535)	48.4% (268/554)	P<.001
Accuracy	58.8% (640/1088)	72.3% (767/1061)	P<.001