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Glenohumeral Impingement Due to Subscapularis Tendon Repair Medialization

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Summary:
Medializing the subscapularis repair can result in glenohumeral impingement especially in positions of internal rotation. Repair at the articular margin results in impingement similar to that of 10mm medialilization from the subscapularis footprint.

Abstract:
Introduction: Previous studies have reported approximately half of shoulders with rotator cuff tears have partial articular-sided subscapularis tears. In cases in which a torn cuff is retracted, reattaching the cuff medial to the anatomic cuff insertion site is an option. By doing so, tension at the repair site can be reduced. Functional outcome does not appear to be compromised by medialization of the subscapularis footprint of 4 to 7 mm. Glenohumeral impingement of the subscapularis to glenoid can occur with medialization of the subscapularis tendon repair. Also, repair of the subscapularis is sometimes done at the articular margin. Therefore, the purpose of this study was to quantify the potential glenohumeral impingement resulting from medialization of subscapularis tendon repair and to compare that to medialization to the articular margin.
Methods: Eight human cadaveric shoulders were tested at 0, 30, and 60 degrees of glenohumeral abduction (Figure 1). The humeral head position relative to the glenoid was digitized at 0, 15, 30, 45 and 60 degrees of internal rotation with a MicroScribe. Following testing, four points along the subscapularis footprint border were marked followed by points at 5, 10 and 15 mm medial to simulate subscapularis medialization (Figure 2 – blue dots). Four points along the articular margin in line with the subscapularis and 5 and 10 mm medial to these points were also digitized (Figure 2 – red dots). These points were then digitized with the MicroScribe and the amount of potential impingement between the subscapularis and the glenoid was calculated for each condition and position. A repeated-measures analysis of variance with a Tukey post hoc test was used for statistical analysis.
Results: Subscapularis medialization from the footprint significantly increased the glenohumeral impingement area in positions of internal rotation greater than 45 degrees (Figure 3) ($P<0.05$). Repair at the articular margin has a similar amount of impingement as 10mm medialization from the subscapularis footprint ($P>0.57$ for each angle).
Conclusion: Medializing the subscapularis repair can result in glenohumeral impingement especially in positions of internal rotation. Repair at the articular margin results in impingement similar to that of 10mm medialilization from the subscapularis footprint.