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Injury to the Suprascapular Nerve in Slap Repair: A Rotator Interval Portal is not Safer Than an Anterosuperior Portal

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Summary:
During SLAP repair, when perforation of the glenoid occurred, 1 o'clock and 2 o'clock posterior suture anchors placed through the rotator interval portal were statistically significantly closer to the suprascapular nerve.

Abstract:
Background:
The suprascapular nerve is potentially at risk during superior labrum repair. The purpose of this study is to compare the risk of injury to the suprascapular nerve during suture anchor placement through an anterosuperior or rotator interval portal. Our hypothesis is that the use of the rotator interval portal provides a safer and more reproducible method than the anterosuperior portal for repair of Type II SLAP tears.

Materials and Methods:
Ten bilateral fresh human cadaveric shoulders were used. Each pair was randomized to suture anchor placement through an anterosuperior portal on one shoulder and a rotator interval portal, made just posterolateral to the biceps, on the contralateral shoulder. Consistent with standard SLAP repair, the suture anchors were placed into the glenoid rim at the one o'clock, eleven o'clock and ten o'clock positions for a right shoulder (eleven o'clock, one o'clock and two o'clock for a left shoulder). Drill holes were created using a 2.4mm drill with a 20mm depth stop collar. Standard 3x14mm suture anchors were placed. Following suture anchor placement, the suprascapular nerve was carefully dissected. Medial glenoid perforation was measured with digital calipers. When perforation occurred, the distance from the suture anchor tip to the suprascapular nerve was measured. The anchors were removed and the distance from the glenoid rim to the suprascapular nerve at each suture anchor entry site was recorded. A depth gage was used to measure the depth of the drill hole for each perforated anchor.

Results:
All of the far posterior suture anchors (defined as the ten o'clock anchor for the right shoulder and two o'clock anchor for the left shoulder) perforated the glenoid rim using either the anterosuperior (AS) or rotator interval (RI) portal. For the far posterior anchor, the distance from the anchor tip to suprascapular nerve averaged 8.02mm (range 3.4mm to 14mm) using the AS portal and 2.1mm (range 0mm to 5.5mm) using the RI portal, a statistically significant (p=<0.001, 95% CI (-7.81, -4.04)) difference of 5.92mm. For the posterior anchors (defined as the eleven o'clock anchor for the right shoulder and one o'clock anchor for the left shoulder) the perforation rate was 80% and 60% for the AS and RI portals, respectively. There was no statistical difference found in the distance from the anchor tip to the suprascapular nerve for the posterior anchors between the AS and RI portals (p=0.36, 95% CI (-6.11, 2.51)). There was no statistical difference in the length of anchor tip exposed between the AS and RI portals for either the posterior (p=0.26, 95% CI (-0.26,0.83)) or far posterior (p=0.9, 95%CI (-4.27, 4.81)) anchors. In addition, there was no statistical difference found in the drill hole depth between the AS and RI portals for either the posterior (p=0.06, 95% CI (-0.23,7.34)) or far posterior (p=0.10, 95% CI (-0.43, 3.76)) anchors.

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Conclusion:
Using an anterosuperior or rotator interval portal results in consistent penetration of 1 o'clock and 2 o'clock posterior suture anchors and may as a result place the suprascapular nerve at risk of iatrogenic injury. Based on the high likelihood of glenoid perforation and closer proximity of the suture anchor tip to the suprascapular nerve, the risk of injury is significantly greater when using a rotator interval portal in performing SLAP repair.