Diagnosis and Management of Quadrilateral Space Syndrome Using Arthroscopic, Extra-Capsular Axillary Nerve Release

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Introduction: Quadrilateral space syndrome is an uncommon condition that can produce debilitating shoulder pain and dysfunction. Diagnosis of this condition has been classically through physical examination and imaging modalities. Management has been through various open and arthroscopic techniques, though series remain limited. Our hypothesis is that quadrilateral space syndrome can be diagnosed with guided injection, and an arthroscopic, all extra-capsular release improves pain and measured patient reported outcome measures (PROMs).

Materials & Methods: A retrospective chart review was performed of all patients diagnosed with quadrilateral space syndrome and receiving arthroscopic quadrilateral space release at a single institution performed by two surgeons between 2021 and 2024. Patient demographics, pre-and post-injection patient reported outcome measures (PROMs) and pre-and post-operative PROMs were collected.

Results: Sixty patients receiving treatment for quadrilateral space were identified, with 40 (66.7%) receiving arthroscopic quadrilateral space release and 20 (33.3%) receiving guided injection alone. The average follow-up was 13.6 +/- 12.8 months (range: 1-49.2 months) and average patient age was 48.2 +/- 14.8 years. Forty patients (n=40/60; 66.7%) had prior ipsilateral shoulder surgery including 6 (n=6/60; 10%) shoulder arthroplasty, 3 (n=3/60; %) instability procedures, 9 (n=9/60; 15%) ipsilateral peripheral nerve releases, 6 (n=6/60; 10%) biceps tenodesis, 3 rotator cuff repair (n=3/60; 5%) and 2 (n=2/60; 3.3%) lower trapezius or latissimus dorsi tendon transfer. The average number of prior surgeries was 2 +/- 3.5; range: 1-20). Twenty-four (n=24/40; 60%) patients received a guided quadrilateral space injection 123 +/- 112 days prior to arthroscopic release. Visual analog pain (VAS) scores did not differ after injection or arthroscopic release (1.2 +/- 1.9 vs 3.3 +/- 2.4; p=0.46) and had a moderate correlation (rho=-0.57;p=0.05). Following arthroscopic release, VAS pain scores (7.0 +/- 2.1 vs 3.3 +/- 2.4; p<0.001), PROMIS Short Form (SF) 7a (29.9 +/- 5.7 vs 31.7 +/- 8.2; p=0.02), quick disabilities arm, shoulder, hand (qDASH) (54.7 +/- 19.9 vs 44.1 +/-24.2; p=0.02), and measured external rotation (47 +/- 13 vs 52 +/-12; p=0.02) significantly improved. There were 5 noted complications (n=5/40; 12.5% rate) including persistent pain (n=4/5; 80%) and transient neurologic injury (n=1/5; 20%). Mulivariate regression did not produce any predictive variables of complications.

Discussion: Corticosteroid injection can diagnose and treat patients with quadrilateral space syndrome. Arthroscopic, extra-capsular quadrilateral space release is effective at improving measurable pain and PROM measures with a low complication profile.

Figure 1. Posterior extra-capsular view of a left shoulder demonstrating the released axillary nerve in the quadrilateral space and adjacent long head of triceps origin

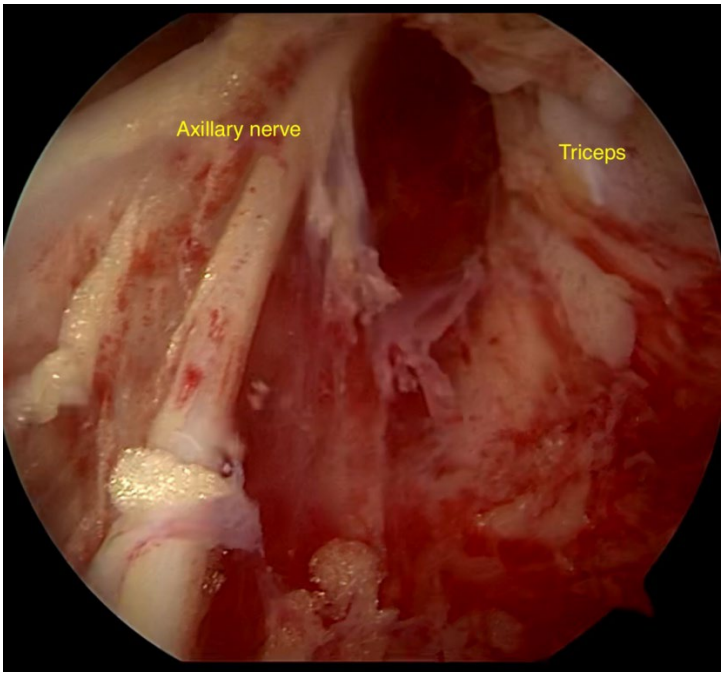

Figure 2.a) Dissection of the axillary nerve as it enters the subdeltoid space and b) traversing into the deltoid musculature