Back to Work, Back to Strength After Irreparable Anterosuperior Rotator Cuff Tear

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Irreparable anterosuperior rotator cuff tears (ASRCTs) are characterized by irreparable tears in subscapularis (SSC) and supraspinatus (SSP) tendons. Irreparable ASRCTs have a low prevalence and are associated with loss of active shoulder elevation, internal rotation, and the risk of a pseudoparalytic shoulder. Currently, joint-preserving treatment options for irreparable ASRCTs are limited, especially in young and high-demand elderly patients. Arthroscopic débridement and partial repair can afford pain relief but may result in limited improvements in range of motion and muscle strength. In addition, these procedures may result in recurrent tears, with a reported incidence rate as high as 52%. Superior capsule reconstruction is a viable treatment option for patients with an irreparable rotator cuff tear, resulting in favorable early clinical results; however, superior capsule reconstruction is contraindicated in patients with an irreparable ASRCT consisting of an irreparable SSC tear. Pectoralis major and minor tendon transfer constitutes a joint-preserving treatment option for irreparable ASRCTs; however, patients with combined irreparable SSC and SSP tears are suboptimal candidates for this procedure because of unfavorable outcomes.

Recently, anterior latissimus dorsi tendon transfer has gained attention as a potential treatment option for patients with an irreparable SSC tear. An anatomic cadaver study by Elhassan et al demonstrated that latissimus dorsi tendon transfer resulted in superior biomechanics compared with pectoralis major transfer and could be performed safely without the risk of nerve complications. Subsequent clinical studies on isolated latissimus dorsi tendon transfer in patients with an irreparable SSC tear have revealed satisfactory clinical outcomes; however, Elhassan et al reported that irreparable SSC tears concomitant with irreparable SSP tears were a negative predictive factor for clinical outcomes. In addition, the authors demonstrated limited complete recovery of superior migration and anterior subluxation of the humeral head in patients with an irreparable anterosuperior tear who underwent isolated latissimus dorsi tendon transfer. In addition, the authors suggested that additional teres major tendon transfer characterized by scapulohumeral kinematics would be beneficial if isolated latissimus dorsi tendon transfer was insufficient to stabilize the joint because of the creation of a powerful posterior line of pull by the two muscles.

This video introduces a novel technique that brings patients back to work and back to strength after an irreparable ASRCT via combined latissimus dorsi and teres major reattachment to the greater tuberosity.

Indications for this technique are as follows: (1) incapacitating pain and/or loss of shoulder functionality that hinders daily activities; (2) irreparable SSC or irreparable anterosuperior (combined SSC and SSP) tears identified preoperatively (Goutallier grade III or grade IV fatty infiltration for SSC and SSP and Patte grade III for SSP identified on MRI) or intraoperatively; (3) intact rotator cuff tendons (infraspinatus and teres minor) with Goutallier grade II or less fatty infiltration confirmed on preoperative MRI; and (4) no advanced cuff tear arthropathy in the glenohumeral joint observed on radiographs (Hamada grade II or less). Contraindications for this technique are as follows: (1) irreparable infraspinatus tendon tear, (2) progressed cuff tear arthropathy (Hamada grade III or higher), and (3) neurologic disorders.

Advantages of this novel technique are as follows: (1) synergistic transfer: internal rotator to internal rotator, with no need for postoperative neuromuscular control rehabilitation and faster postoperative recovery in activities of daily living; (2) no need for interpositional autograft or allograft, which results in no donor-site morbidity and makes the procedure budget friendly; (3) only requires a single deltopectoral incision, which is familiar to most orthopaedic surgeons and makes the procedure efficient; (4) preserves the pectoralis major tendon and the remaining inferior SSC muscle portion, which does not violate the internal rotational muscles around the shoulder; (5) can be safely performed without nerve complications by fixing the transferred latissimus dorsi and teres major tendons to the greater tuberosity rather than the lesser tuberosity, making its vector less vertical and avoiding axillary nerve impingement. Disadvantages of the procedure include possible neurovascular injury during latissimus dorsi and teres major tendon exposure and detachment if the approach, anatomy, and surgical technique associated with tendon transfer are unfamiliar.