Outcomes After Arthroscopic-Assisted Lower Trapezius Tendon Transfer and Superior Capsular Reconstruction for Massive Irreparable Rotator Cuff Tears

Musab Gulzar[1], Haley M. McKissack[1], Hayden L. Cooke[1], Sameer R. Khawaja[1], Krishna N. Chopra[1], Michael B. Gottschalk[1], Eric R. Wagner[1]
[1]Emory University School of Medicine, Atlanta, GA
Mgulzar@emory.edu

INTRODUCTION: Massive irreparable rotator cuff tears (MIRCT) are commonly treated with superior capsular reconstruction (SCR) to achieve pain relief and restoration of function in the affected shoulder. Alternatively, a lower trapezius tendon transfer (LTTT), which more accurately imitates the line of pull of the infraspinatus, thus contributing to a theoretical biomechanical advantage and overall improvement in shoulder function and range of motion is also used. This study sought to compare these two procedures, SCR and LTTT, by evaluating patient postoperative outcomes.

METHODS: After approval from our institution's IRB, patients who received either a SCR or LTTT from 2015-2022 for MIRCT were identified through a retrospective review of the electronic medical record at our institution. Only patients with more than a year of follow up were included in our analysis. The average follow up for SCR and LTTT patients was 3.25 years (39 months) and 3.08 years (37 months) respectively. The following measures were compared among the two groups at final follow up: post-operative range of motion, reoperation rates, failure rates, and patient reported outcomes. The patient reported outcomes included pain score, American Shoulder and Elbow Surgeons (ASES) score, and shoulder subjective value (SSV). SPSS Statistics software was utilized for all group comparisons. Student t-tests and Chi-Square were performed for all continuous and categorical variables, respectively.

RESULTS SECTION: A total of 76 patients were included, of whom 39 underwent the SCR procedure and 37 underwent the LTTT procedure. Range of motion for LTTT patients at final follow up resulted in significantly greater abduction (140.3° vs 98.6°; p<0.001), forward flexion (161.6° vs 124.7°; p<0.001), and numerically-scored internal rotation (7.3 vs 5.8, p<0.001) when compared with the SCR patients. Revision rates were also significantly lower for the LTTT group ((8.1% vs 25.6%; p = 0.041). The SCR group had a failure rate that was three times greater than that of the LTTT group (38.5% vs 10.8%; p = 0.005). Average VAS score at final follow up was four times lower for patients who received the LTTT in comparison to the SCR cohort (0.73 vs 3.00; p<0.001). ASES (82.4 vs 74.5, p =0.002) and SSV (82.5 vs 70.2, p =0.003) scores were significant higher for the patients who underwent the LTTT.

DISCUSSION: The LTTT procedure, which better replicates the infraspinatus' line of pull, was proposed to have a more favorable outcome. This was corroborated by our results which showed lower reoperation and failure rates for LTTT in comparison to SCR. LTTT also demonstrated superior range of motion, post-operative patient reported outcomes, and pain scores. The sample size for this analysis may be a limitation of the results. As more patients undergo SCR or LTTT and reach one year follow up, we intend to include them in our analysis to further strengthen our results.

SIGNIFICANCE/CLINICAL RELEVANCE: The results of this study advocate that surgeons perform a LTTT over SCR for patients with MIRCT when eligible. Patient reported outcomes and physical measurement results demonstrate an overall greater clinical improvement for LTTT when compared to SCR.

IMAGES AND TABLES:

Table I: Postoperative outcome measures between groups

Outcome measure	SCR	LTTT	P Value
ASES Score	74.53 ± 23.81	82.36 ± 15.31	0.002*
SSV Score	70.24 ± 25.33	82.51 ± 15.27	0.003*
VAS Pain Score	3.00 ± 3.17	0.73 ± 1.47	<0.001*
Forward Flexion	124.7 ± 49.73	161.6 ± 19.08	<0.001*
Abduction	98.57 ± 36.53	140.3 ± 20.75	<0.001*
External Rotation	43.53 ± 22.20	59.30 ± 18.98	0.577
Internal Rotation	5.88 ± 3.22	7.26 ± 1.88	<0.001*

Data is presented as mean ± standard deviation.
SCR: superior capsular reconstruction; LTTT: lower trapezius tendon transfer; ASES: American Shoulder and Elbow Surgeons Shoulder Score; SSV: shoulder subjective value; VAS: visual analog scale
* Represents statistical significance

Table 2: Postoperative failure and revision rates between groups

Outcome measure	SCR (n=39)		LTTT (n=37)		P value
Failure	15	38.46%	4	10.81%	0.005
Revision	10	25.64%	3	8.11%	0.041