Latissimus Dorsi Transfer versus Lower Trapezius Transfer for Posterosuperior Irreparable Rotator Cuff Tears

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INTRODUCTION:

Posterosuperior irreparable rotator cuff tear (IRCT) causes significant shoulder pain and loss of function, and management of this condition can be challenging. Tendon transfer is an effective treatment option for posterosuperior IRCT in relatively young patients and elderly high-demand patients without arthritic changes. Several tendon transfer approaches are available for restoration of shoulder function by reconstruction of the posterosuperior IRCT. For several decades, latissimus dorsi transfer (LDT) has been widely used for treatment of posterosuperior IRCT with favorable clinical outcomes. Recently, lower trapezius tendon transfer (LTT) has emerged as an effective alternative tendon transfer approach for restoration of shoulder external rotation in posterosuperior IRCT, which has better biomechanical adventages rather than LDT. However, the optimal treatment option for patients with posterosuperior IRCT remains a subject of ongoing debate. This study aimed to compare clinical and radiological short-term outcomes between arthroscopic-assisted LDT (aLDT) and arthroscopic-assisted LTT (aLTT) in patients with posterosuperior IRCT.

METHODS: This retrospective crossover study included patients who underwent aLDT or aLTT for posterosuperior IRCT and who had a minimum clinical follow-up time of 2 years after undergoing surgical procedures between January 2012 and June 2019 (Fig. 1.). A total of 90 patients with posterosuperior IRCT were divided into two groups according to the surgical procedure: group D underwent aLDT (n = 48) (Fig. 2) and group T underwent aLTT (n = 42) (Fig 3.). Clinical outcomes comprised the visual analogue scale (VAS) score for pain, active shoulder range of motion (ROM), American Shoulder and Elbow Surgeons (ASES) score, and activities of daily living which require active external rotation (ADLER) score. Radiologic outcomes included acromiohumeral distance (AHD). The progression of arthritis was evaluated using Hamada grade. Graft integrity was assessed using postoperative magnetic resonance imaging.

RESULTS:

The patient population comprised 90 men (48 in Group D and 42 in Group T) and 31 women (16 in Group D and 15 in Group T). The mean age at surgery was 60.9 ± 4.5 years in group D and 63.3 ± 5.8 years in group T. No significant between-group differences were observed in patient characteristics, underlying disease (diabetes mellitus and hypertension), BMI, fatty infiltration, and Tm muscle status preoperatively (Table 1). Significant improvements in clinical outcomes were observed in both groups. Active shoulder external rotation ($p < 0.001$), postoperative ASES score ($p < 0.001$), and ADLER score ($p < 0.001$) were significantly higher in group T than in group D (Table 2). AHD at 2-year follow-up was significantly higher in group T than in group D ($p < 0.001$). The rate of progression of arthritis was significantly higher in group D (31.3%) than in group T (7.1%) ($p = 0.031$) (Table 3). Based on 2-year postoperative MRI, a graft re-tear developed in one patient in group D and three patients in group T. These patients underwent reverse total shoulder arthroplasty revision due to persistent pain and unsatisfactory shoulder function.

DISCUSSION AND CONCLUSION:

The main finding of this study was that LDT and LTT for posterosuperior IRCT resulted in a significant decrease in pain and promoted improvements in shoulder function at short-term follow up. Notably, LTT demonstrated superior results compared to LDT in terms of improvements in shoulder function and progression of arthritis. Our findings indicate that LTT may be the preferred treatment option for posterosuperior IRCT in relatively active and young patients.