Clinical Outcomes of Fully Arthroscopic Latissimus Dorsi Transfer for the Treatment of Posterior-Superior Irreparable Rotator Cuff Tears

Hui Yan, Lin Lin

INTRODUCTION: The management of posterior-superior irreparable rotator cuff tears (PSIRCTs) remains a significant challenge in active individuals without arthritis. Fully arthroscopic latissimus dorsi transfer (LDT) have been developed to treat PSIRCTs. However, the results of fully arthroscopic LDT are limited. This study investigates the clinical outcomes of fully arthroscopic LDT in patients with PSIRCTs.

METHODS: This retrospective study included patients who underwent fully arthroscopic LDT for PSIRCTs. Inclusion criteria included persistent with irreparable supraspinatus and infraspinatus tears and minimal glenohumeral arthritis. Excluded were patients who had less than 12 months of follow-up. Visual analog scale (VAS) for pain, range of motion (ROM), functional outcome measures including American Shoulder and Elbow Surgeons (ASES) form, University of California Los Angeles score (UCLA) and Simple shoulder test (SST) were assessed and compared pre and post-operatively. The integrity of transferred LD was evaluated by MRI. The strength of external rotation and abduction was evaluated and qualified by hand-held dynamometer (Model 01165A) pre and post-operatively.

RESULTS: A total of 27 patients were included, with a mean age of 62.9 years and an average follow-up period of 24.1 months. Significant improvements were observed in VAS and all patient-reported outcome measures, with $P < 0.001$. Significant improvements were observed in forward elevation (104° to 157°), abduction (85° to 140°), external rotation at the side (15° to 44°), and external rotation at 90° abduction (27° to 51°). One case of radial nerve palsy was reported and recovered in 2 weeks. No retear of transferred LDT were found confirmed by MRI at latest follow-up. The strength of external rotation was improved from 32 to 82 N ($P < 0.001$) and from 40 to 65N for abduction strength ($P < 0.001$).

DISCUSSION AND CONCLUSION:

A combined fully arthroscopic technique for transfer of LD and TM has been proposed in which the tendons are fixed at the junction of SSP and ISP to decrease failure rate. According to our experiences, the TM tendon can be detached, and be transferred posteriorly and fixed in a lower position compared with fixation of the LD. Because the course of TM tendon and muscle unit is 5cm shorter and would decrease the excursion of the transfer when fixation together.

There are some limitations in this study. First, the sample size is small which may lead to a type 2 error. But this is comparable to the literature on this rare procedure. Second, the period of follow-up is insufficient to fully analyze osteoarthritis progression. Third, fully arthroscopic LDT has the steep learning curve. There is always a risk of injury to the neurovascular structures. The present technique requires improved arthroscopic skills with expert knowledge of the anatomy.

This study has some strengths. First, all surgeries were performed at the same institution by two senior shoulder surgeons using the same standardized technique which increases internal validity of the results. Second, the integrity of transferred LD was evaluated by postoperative MRI and no tear was found. Third, the external and abduction strength of shoulder were qualified using hand-held dynamometer.

The fully arthroscopic LDT transfer provides significant pain relief and functional improvements in the treatment of PSIRCTs. Our findings indicate that fully arthroscopic LDT may be the preferred treatment option for PSIRCTs in relatively active and young patients.