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Arthroscopic LHBT semi-bone tunnel reconstruction combined with infraspinatus advancement for irreparable supraspinatus tears: A retrospective cohort study evaluating mid/long-term outcomes

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Introduction and Background

To evaluate the mid/long-term clinical outcomes of arthroscopic Long Head of Biceps Tendon (LHBT) semi-bone tunnel reconstruction combined with infraspinatus tendon superiorization for irreparable supraspinatus tendon tears.

Material and Method

A retrospective analysis was conducted on 36 patients with irreparable supraspinatus tears treated by arthroscopic LHBT semi-bone tunnel reconstruction combined with infraspinatus superiorization from January 2021 to January 2025. Clinical parameters, including shoulder pain, range of motion (ROM), and complications, were recorded. Functional outcomes were assessed preoperatively and postoperatively using the Constant-Murley score and the Visual Analogue Scale (VAS) for pain. Tendon-bone interface healing was evaluated by magnetic resonance imaging (MRI).

Results

All patients completed 6–24 months of follow-up without infection or fixation failure. MRI at 12 months showed complete tendon-bone healing with continuous reconstructed rotator cuff integrity in 30 cases, partial retears in 4, and complete retear in 2. At the final follow-up, the mean shoulder ROM was as follows: forward flexion (165.7°±3.4°), abduction (152.8°±3.2°), external rotation with the arm in abduction (72.4°± 3.4°), and internal rotation (40.5°±3.3°). The Constant-Murley score improved significantly from a preoperative mean of (30.2±1.3) to (81.4±3.2) postoperatively ($P < 0.05$). The mean VAS pain score decreased from (7.1±3.2) preoperatively to (1.6±0.5) postoperatively ($P < 0.05$).

Conclusions

Arthroscopic LHBT semi-bone tunnel reconstruction combined with infraspinatus tendon superiorization achieves reliable tendon-bone healing and excellent functional restoration for irreparable supraspinatus tears. The autologous LHBT graft provides stable dual-point fixation, reconstructs the distal insertion, and reduces proximal tension. Its proximal segment functions as an internal bracing system, re-establishing superior capsule integrity and static stability. The dynamic coupling between the superiorized infraspinatus tendon and the supraspinatus remnant further enhances joint stability. This method eliminates donor-site morbidity, is technically feasible, significantly reduces shoulder pain, and improves shoulder function, representing a promising surgical option for irreparable supraspinatus tendon tears.