Clinical and Patient Reported Outcomes After Posterior Distal Tibia Allograft Reconstruction for Glenohumeral Instability: A MultiCenter Study

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Introduction: Recurrent posterior glenohumeral instability and posterior instability in the setting of glenoid bone loss (GBL) represent challenging pathologies that are not reliably corrected with soft tissue operations such as posterior labral repair alone. In recent years, there has been increased interest in arthroscopic reconstructive techniques including with posterior distal tibial allograft (DTA). However, given the recency of this procedure and relatively poor recognition of posterior glenoid bone loss, most reports of outcomes are limited to technique reports and small series. The purpose of this study is to evaluate imaging and patient-reported outcomes after arthroscopic posterior stabilization with DTA in a larger, multicenter cohort of patients.

Materials & Methods: We performed a retrospective review of prospectively collected data for all patients who underwent arthroscopic assisted posterior shoulder stabilization with DTA at three institutions between January 2016 and January 2024. Posterior DTA reconstruction was performed for patients in the setting of posterior instability with GBL >10% or with GBL in the setting of a failed, appropriately performed posterior labral repair. No other source of graft was used during this period. We excluded those with clinical or radiographic follow-up less than six months. We collected demographics, prior instability procedures, surgical details, outcome data, and patient-reported outcomes. Intraoperative details included size of bone block, number of suture anchors for concomitant posterior labral repair, and fixation type used. We measured glenoid bone loss using the perfect circle method and assessed postoperative imaging for graft resorption and union and for development of osteoarthritis. The primary outcome was change in preoperative patient-reported outcomes beyond minimal clinically important difference (MCID) and final PROMIS scores. MCIDs were 169.6, 15%, and 1.1 for WOSI, SANE, and VAS, respectively. [1,2]

Results: We identified 25 patients who underwent arthroscopic posterior glenohumeral stabilization with DTA. One patient was excluded for insufficient available follow-up for total 24 patients including 22 males and 2 females. Median age was 30.1 years (IQR 22.7-35.7). Preoperative imaging demonstrated average glenoid bone loss of 17.2+/-6.2% (18.2+/-6.9% for index, 15.6+/-4.6% for revisions) and glenoid retroversion of average 10.9+/-5.0 degrees. Three patients had Samilson-Prieto grade 1 or 2 osteoarthritis prior to surgery. Revision procedures accounted for 37.5% (9/24) of those performed. At median follow-up 2.60 (IQR 1.82-3.67) years, PROs had improved from preoperative state both clinically and statistically for WOSI (1336.3 to 825.5, delta -510.9+/-737.0, p=0.0068), SANE (53.3% to 73.6%, delta +20.2%+/-21.5%, p=0.00028), and VAS (5.6 to 1.9, delta -3.9+/4.3, p<0.001). Average scores for other PROs at follow-up were 63.3+/-31.4, 48.0+/-9.6, and 55.5+/-10.8 for ASES, PROMIS-PF, and PROMIS-Pain, respectively. Three patients experienced recurrent/persistent posterior instability symptoms without frank dislocations. At final imaging follow-up at median 1.03 (IQR 0.47-2.42) years, radiographic arthritis in those with available imaging had developed or worsened in 31.8% (7/22), with two developing grade 3+ OA. On imaging, one patient ultimately developed a nonunion and one other experienced complete graft resorption, though neither experienced recurrent instability.

Discussion: Bone block augmentation for patients with posterior instability and glenoid bone loss is an effective surgical option for improving patient outcome measures and managing instability. While there is a notable high rate of progression of degenerative changes and overall outcomes are somewhat guarded, it should be considered for patients with critical posterior bone loss. Further clinical study comparing this option to alternatives is warranted.

1. Long Y, Zheng Z, Li X, et al. Preoperative patient-reported outcome measures predict minimal clinically important difference and patient-acceptable symptomatic state following arthroscopic Bankart repair. Bone Joint J. 2024;106-B(10):1118-1124.
2. Hawkins, Richard J. et al. Measure what matters: Single Assessment Numeric Evaluation (SANE) score as the critical measure for shoulder outcomes. Journal of Shoulder and Elbow Surgery, Volume 33, Issue 6, 1397 - 1403