Outcomes of Anterior Talofibular Ligament Repair Using Open Bröstrom, Arthroscopic Bröstrom, or Lasso-Loop Techniques: A Meta-Analysis

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Disclosures: The authors declare that they have no conflicts of interest related to this study.

INTRODUCTION: Anterior Talofibular Ligament (ATFL) injury is a common cause of chronic lateral ankle instability, and it is more frequent among individuals who are active and participate in sports. There are multiple techniques to repair the ATFL, including the historically gold-standard Open Bröstrom (OB) technique, the more novel Arthroscopic Bröstrom (AB) technique, and the arthroscopic Lasso Loop (LL) technique. This meta-analysis seeks to compare outcome statistics of these techniques for ATFL repair.

METHODS: We conducted a literature search on Embase, Google Scholar, and PubMed for comparison studies or randomized controlled trials that included at least two of the surgical techniques and at least one relevant functional outcome or complication statistic up until October 2025. Statistical analyses were performed using Review Manager Web, and a P-value ≤ 0.05 was considered statistically significant. The risk of bias was assessed using Review Manager Web and the Newcastle-Ottawa scale.

RESULTS SECTION: This analysis includes a total of 1,426 patients from 21 studies. When compared to OB, AB had a significantly lower post-op Visual Analog Scale (VAS) score (MD: 0.17, 95% CI 0.04 to 0.30, P = 0.01), higher Karlsson-Peterson score (MD: -1.18, 95% CI -1.87 to -0.50, P < 0.001), higher American Orthopaedic Foot and Ankle Society (AOFAS) score (MD: -1.83, 95% CI -3.02 to -0.63, P = 0.003), and shorter time to return to daily work (MD: 1.3, 95% CI 0.17 to 2.43, P = 0.02). Compared to OB, LL had a significantly lower VAS score (MD: 1.32, 95% CI 1.03 to 1.61, P < 0.001) and a higher AOFAS score (MD: -3.56, 95% CI -6.45 to -0.67, P = 0.02). However, OB had a lower range of motion restriction rate (RR = 0.09, 95% CI 0.02 to 0.43, P = 0.02) and a shorter time to return to running (MD: -5.59, 95% CI -9.99 to -1.19, P = 0.01) compared to LL. No significant results were found comparing AB and LL.

DISCUSSION: Given the frequency of ATFL repairs and the variety of surgical techniques available, it is necessary to determine which technique is likely to yield the best patient outcomes. Our meta-analysis aims to compare 3 common repair techniques (AB, OB, and LL) to determine the most effective method. We found that AB had a significantly lower VAS score, significantly higher Karlsson-Peterson and AOFAS scores, and significantly shorter time to return to daily work compared to OB. We also found that LL had significantly lower VAS and significantly higher AOFAS scores compared to OB. However, OB had a significantly lower risk of ROM restriction and significantly shorter time to return to running than LL.

The main limitation of our analysis is the sample size of the LL repair technique. There is a limited number of relevant studies comparing LL to AB or OB, resulting in a sample size of 61 LL patients, compared to 627 OB and 738 AB patients.

SIGNIFICANCE/CLINICAL RELEVANCE: An AB repair appears to be the superior technique when compared to OB repair. An LL technique may also be superior to OB, but ROM restriction and return to running favor OB. AB should be utilized over OB when possible, and LL may be used interchangeably with OB.

REFERENCES: Guo et al. Knee Surg Sports Traumatol Arthosc. 2022, Moorthy et al. J Foot Ankle Surg. 2021