

## Optimum Insertional Direction of the Suture Anchor in Arthroscopic Lateral Ankle Ligament Repair

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**Introduction/Purpose:** The gold standard for chronic lateral ankle ligament injury is ligament repair via the modified Broström-Gould procedure. Recently, lateral ankle ligament repair has been performed arthroscopically. This requires the insertion of one to three suture anchors in the fibula from anterior to posterior via the accessory portal. It is important to insert the suture anchors completely into the fibula bone. Because the distal fibula is tapered and has a fossa on the posterior surface, unfavorable insertional direction of the suture anchor can lead to complications such as inadequate suture anchor stability or friction between the suture anchor and the peroneus tendons. This study aimed to investigate the distance between the insertion point of the suture anchors and the posterior surface of the fibula on computed tomography (CT) images.

**Methods:** Twenty ankles from 16 patients who had undergone three-dimensional CT scans for foot or ankle disorders without deformity of the fibula were assessed (10 male, 10 female; mean age, 32 years; age range, 12–78 years). The shortest distance from the insertion point of the suture anchor to the deepest point of fossa/the top of the convex of fibula was measured on the axial planes tilting from the longitudinal axis of the fibula at 90°, 75°, 60°, and 45°. We also measured the distance from the insertion point of the suture anchor to the posterior surface of the fibula, in a direction parallel to the sagittal plane of the lateral surface of the talus on the axial planes tilting from the longitudinal axis of the fibula at 90°, 75°, 60°, and 45°.

**Results:** The posterior fossa was observed in all cases on the 90° and 75° images. The distance from the insertion point to the posterior surface of the fibula in a parallel direction was 15.6 mm at 90°, 18.0 mm at 75°, 21.5 mm at 60°, and 24.8 mm at 45°. The posterior points in a parallel direction were located on the posterior fossa in 40% of cases at 90°, in 10% at 75°, and in 0% at 60° and 45°.

**Conclusion:** We suggest that the suture anchor should be directed from anterior to posterior at an angle of less than 60° to the longitudinal axis of the fibula, parallel to the lateral surface of the talus, in order to avoid passing through the fibula.

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