Effectiveness of the Plantar Aponeurosis Release for Limitation of the First Metatarsophalangeal Joint Extension after Hallux Valgus Surgery

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Introduction/Purpose: Even though stiffness of the first metatarsophalangeal joint (1MTP) is not a common complication, reduced dorsiflexion range of motion at the 1MTP after surgery for hallux valgus was reported as a complication. However, few clinical studies have investigated this issue and no clinical resolution has been reached thus far. We hypothesized that tightness of the gastrocnemius-plantar aponeurosis complex is one of the factors that limits the extension of 1MTP after hallux valgus surgery. Thus, an additional procedure of the plantar aponeurosis release during hallux valgus surgery may improve the range of extension at 1MTP. The purpose of this study was to test the efficacy of plantar aponeurosis release in improving the range of extension when a limitation is detected after hallux valgus surgery.

Methods: Thirteen patients (17 feet) with limited 1MTP extension after hallux valgus surgery, underwent an additional procedure of plantar aponeurosis release. The inclusion criterion was limitation of 1MTP extension showed more than 15 degrees difference between knee extension and flexion position, measured after completing all procedures of the hallux valgus surgery. The passive range of 1MTP extension was evaluated by a goniometer while the first metatarsal head was supported with a palm, assuming a weightbearing position with knee extension and flexion, after completing all procedures of the hallux valgus surgery (Barouk test). A silfverskiold test was performed in all cases preoperatively. The weightbearing dorsoplantar and lateral radiographs of the foot were performed to measure the hallux valgus angle, intermetatarsal angle, distal metatarsal articular angle, and the talo-first metatarsal angle.

Results: The mean range of 1MTP extension significantly improved from 2.53 degrees to 40.88 degrees in the knee extension position (p<0.0000). The mean range of the 1MTP extension also improved from 18.24 degrees to 43.24 degrees in the knee flexion position. The silfverskiold test was positive in 12 cases. In all patients, congruence of 1MTP was corrected. There were no surgery-related complications such as plantar aponeurosis rupture or nerve injury.

Conclusion: Our study supports tightness of the gastrocnemius-plantar aponeurosis complex is one of the factors that limit the extension of 1MTP after hallux valgus surgery. Hence, plantar aponeurosis release can be considered as an effective additional procedure to improve the range of 1MTP extension when a limitation is presented after hallux valgus surgery.

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