Effectiveness of Lateral Soft Tissue Release of the 1st Metatarsophalangeal Joint Through a Medial Transarticular Approach – A Cadaver Study

Cesar de Cesar Netto, MD, PhD, Ashish Shah, MD, Parke Hudson, BS, Bahman Sahranavard, MD, Brent Cone, BS, Ibukunoluwa Araoye, MS, Sung Lee, BS, Shelby Bergstresser, BS, Michael Johnson, MD, David Johannesmeyer, MD, Caleb Jones, BS

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Introduction/Purpose: First metatarsophalangeal joint lateral soft tissue release is frequently performed during corrective surgery for hallux valgus deformity. Surgical approaches include an open dorsal approach as well as a medial transarticular approach. The medial transarticular approach avoids the need for a second incision while also attenuating the risk of avascular necrosis of the first metatarsal head. However, this method is limited by the poor visualization of the lateral structures through the joint. The objective of this study was to evaluate the effectiveness of the medial transarticular approach for lateral soft tissue release in the 1st metatarsophalangeal joint.

Methods: Ten below-the-knee fresh-frozen cadaveric specimens were used (6 females, 4 males). The mean age was 73.4 years. Two specimens had moderate hallux valgus deformity. None of the samples had considerable degenerative changes of the first metatarsophalangeal joint. Lateral soft tissue release was performed using a single 2.5cm medial incision. Lateral soft tissue release targeted the lateral collateral ligament, lateral capsule, adductor hallucis muscle tendon and lateral metatarsosesamoid suspensory ligament. A single surgeon performed all procedures. An extended lateral dissection of the 1st intermetatarsal space was carried out to examine the accuracy of the technique. Successful release of each targeted structure (4 total) was recorded for each specimen. Thus, the percentage of successful release was computed for each specimen. Injuries to important non-targeted structures were also registered.

Results: All four targeted structures were successfully released (100%) in seven of the ten cadavers. Three out of four structures were released (75%) in one cadaver, while two of the four and one of the four targeted structures were successfully released in the other two cadavers (50% and 25% success respectively). Lateral collateral ligament was successfully released in all cadavers. Lateral joint capsule, adductor hallucis muscle tendon, and lateral metatarsosesamoid suspensory ligament were released in 80% of the specimens. 1st metatarsal head chondral and unintended release of lateral head of the flexor hallucis brevis occurred respectively in 40% and 50% of the procedures. No injuries to the flexor hallucis longus tendon, neurovascular bundle, deep transverse metatarsal ligament or chondral damage to the proximal phalanx were recorded.

Conclusion: Lateral soft tissue release of the first metatarsophalangeal joint can be successfully performed through a medial transarticular approach. Inadvertent release of the lateral head of the flexor hallucis brevis and chondral damage of the 1st metatarsal head are complications to be considered.
Accuracy of Transarticular Lateral Soft Tissue Release of the 1st Metatarsophalangeal Joint – A Cadaver Study

Medial Approach and Transarticular Lateral Release

Dorsal Intermetatarsal Dissection and Evaluation of the Lateral Soft Tissue Release Accuracy

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