Background
The release of contracted lateral soft tissue structures of the first metatarsophalangeal joint is frequently part of the surgical treatment of hallux valgus deformity. The 1st intermetatarsal space open dorsal approach and the single medial incision transarticular approach represent possible options. Advantages of the transarticular approach include avoidance of a second incision and a lower risk of 1st metatarsal head AVN. However, the inherently limited visualization of the structures through this approach might limit its effectiveness. The objective of this study was to evaluate the accuracy of hallux valgus lateral soft tissue release through the transarticular approach.

Material and Methods
10 below-knee fresh-frozen cadaveric specimens were used (6 females/4 males, mean age, 73.4 years), including two specimens with moderate hallux valgus deformity. None of the specimens had considerable degenerative changes of the 1st MTP joint. Lateral release was performed by the same surgeon through a single medial approach of 2.5cm with a no15 scalpel blade. Surgical aim was to release four 1st MTP joint complex structures: lateral collateral ligament, lateral capsule, adductor hallucis muscle tendon and lateral metatarsosesamoid suspensory ligament. Once completed, a lateral extended dissection of the 1st intermetatarsal space was performed. Accuracy was graded in accordance to the number of structures successfully released: 0% (no structures), 25% (1/4), 50% (2/4), 75% (3/4) and 100% (4/4). Inadvertent injuries to soft tissue structures (flexor hallucis brevis and longus tendons, deep transverse metatarsal ligament and first intermetatarsal neurovascular bundle) and articular cartilage of 1st metatarsal head and proximal phalanx were recorded.

Results
The surgical accuracy for lateral soft tissue release of the 1st MTP joint through the transarticular medial approach was 100% in 7 cadaveric specimens, and respectively 75%, 50% and 25% in the other 3 specimens. The lateral collateral ligament was successfully released in all cadavers. The lateral joint capsule, adductor hallucis muscle tendon and lateral metatarsosesamoid suspensory
ligament were released in 80% of the specimens. Chondral damage of the 1st metatarsal head and unintended release of the 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 and chondral damage of the proximal phalanx were recorded.

Conclusion

Our cadaveric anatomical study has shown a high accuracy in the release of specific lateral soft tissue structures of the 1st MTP joint through a medial transarticular approach. Inadvertent release of the lateral head of the flexor halluc brevis and iatrogenic chondral damage of the 1st metatarsal head are complications to be considered.