PAPER SESSION 5: TENDON

Moderators:
Bryan D. Den Hartog, MD (Rapid City, South Dakota)
Sheryl M. Smith, MD (Oklahoma City, Oklahoma)

11:59 am
Anatomic Comparison of Lateral Transfer of the FHL and FDL for Concomitant Peroneal Tears

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Introduction:
Concomitant tears of the peroneus longus and brevis tendons are rare injuries, and described treatment options include single- and two-stage lateral transfers of the FHL and FDL tendons. While clinical results are successful, we have observed complications of tibial neuritis from lateral transfer of the FDL tendon across the posterior neurovascular bundle. The purpose of this study was to evaluate the anatomic benefits, feasibility, and constraints of lateral FHL and FDL tendon transfers with regards to available tendon length, diameter, and proximity to the posterior neurovascular bundle.

Methods:
Nine fresh-frozen cadaveric specimens were obtained for study. The peroneal tendons were excised and the FHL muscle and tendon exposed through a lateral curvilinear incision. A standard medial approach to the plantar aspect of the foot was performed and the FHL and FDL tendons identified distal to the Knot of Henry. The FHL tendon was cut at its distal extent in the incision; the FDL tendon was cut at its division into the individual digital flexors. The FDL was passed into an accessory posteromedial incision in the distal leg. Lateral transfers of the FHL and FDL tendons were performed, passing the FDL tendon both posterior to the neurovascular bundle and anterior along the posterior tibia and interosseous membrane. Tendon diameters were measured with an Arthrex® tendon sizer. Each tendon was passed through a bone tunnel in the base of the 5th metatarsal and sutured in place with the ankle and hindfoot in maximal eversion and dorsiflexion. After securing the FDL tendon transfer, the foot was manipulated through a full range of motion and the posterior neurovascular bundle examined for signs of compression.

Results:
Average FHL tendon diameter measured 5.1mm; the FDL measured 4.5mm. After passage through the bone tunnel, an additional 4.94cm of FHL tendon remained to suture to itself; only 0.52cm and 0.54cm remained for the posterior and anterior FDL transfers, respectively. After every FDL transfer posterior to the neurovascular bundle, the tendon produced obvious visual compression on the tibial nerve with plantarflexion and inversion of the ankle and hindfoot. There was no significant difference in the position of the distal muscle belly comparing the transferred FHL to the native peroneus brevis.

Conclusion:
Use of the FHL tendon for lateral transfer consistently provides sufficient length to secure the graft after passage through a bone tunnel, offers a larger diameter tendon for transfer, and limits the need for an additional posteromedial incision, without increasing muscle bulk within the peroneal groove. FDL fixation options may be limited due to its shorter length after transfer both anterior or posterior to the neurovascular bundle. Lateral transfer of the FDL tendon posterior to the neurovascular bundle places visible compression on the tibial nerve with ankle and hindfoot range of motion. This anatomic study confirms several advantages for the use of the FHL tendon as a dynamic transfer in cases of peroneus longus and brevis rupture.