Plantar Fascia Release Through a Single Lateral Incision: a Cadaveric Analysis of a Novel Surgical Technique
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Introduction/Purpose: Plantar fascia release (PFR) and calcaneal slide osteotomy (CSO) are often components of surgical management for cavus deformities of the foot. In this setting, the PFR has traditionally been performed through an incision over the medial calcaneal tuberosity, while the CSO is performed through a lateral incision. Two separate incisions can potentially increase surgical morbidity. We hypothesized that the plantar fascia could be fully released from the same lateral based incision that is used for the CSO, obviating the need for a medial incision.

Methods: Six cadaver feet were dissected. A medial sided dissection was performed to isolate the tibial, medial plantar, lateral plantar, and calcaneal nerves, and the origin of the plantar fascia. Next, an incision was made on the lateral aspect of the ankle inferior and parallel to the peroneus longus tendon. Dissection was carried to bone. A curved face osteotome was utilized to sweep the plantar fascia off the calcaneus just distal to its proximal insertion. A #10 scalpel was inserted into this space, parallel to the plantar fascia and was directed towards the plantar fascia insertion; it was then turned ninety degrees so that the blade was perpendicular to the plantar fascia. The ankle was dorsiflexed until a full release was achieved. A Stryker oscillating saw was used to create a CSO through the lateral incision. We then inspected the medial structures in their relationship to the PFR and CSO.

Results: In all six cadavers, the plantar fascia was fully released from its origin at the medial calcaneal tuberosity through the lateral incision. There was no obvious damage to the medial and lateral plantar nerves with this lateral based PFR. The CSO made through the lateral incision reliably crossed the calcaneal branch of the tibial nerve in all specimens and the osteotomy was posterior to the lateral and medial branches of the tibial nerve.

Conclusion: PFR through a lateral incision is a safe and reliable method as part of the surgical treatment for cavus deformities of the foot. We achieved a full PFR in each cadaver specimen. An added benefit is that PFR through a lateral incision avoids the morbidity of an additional surgical incision. Further, a calcaneal slide osteotomy performed through a lateral based incision reliably crosses the calcaneal branch of the tibial nerve. Both PFR and CSO can be safely performed through a lateral incision; however, care must be taken when completing the CSO to ensure that the medial neurovascular structures remain uninjured.

Fig. 1a shows standard lateral incision. Fig. 1b shows lateral (solid arrow) and medial plantar (hollow arrow) nerves, calcaneal branches (star) of tibial nerve, plantar fascia (*). Fig 1c shows plantar fascia released.

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