Proximity of the Lateral Calcaneal Artery With a Modified Extensile Lateral Approach Compared to Standard Extensile Approach

John Kwon, MD, Mohammad Ghorbanhoseini, MD, MCh(Orth), Tyler Gonzalez, MD, MBA, Matthew Riedel, MD, Ara Nazarian, PhD

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Introduction/Purpose: The extensile lateral approach (EL) has been associated with increased wound complications such as apical necrosis which may be due partially from violation of the lateral calcaneal artery (LCA). Traditionally, the vertical limb has been placed half-way between the fibula and Achilles tendon, which may be suboptimal given the proximity to the LCA. We hypothesized that placing the vertical limb further posterior (ie, modified EL [MEL]) would increase the distance from the LCA. The purposes of this study were to quantify the location of the LCA in relation to the vertical limb of the traditional EL approach and to determine if utilizing the MEL approach endangered the LCA to a lesser extent.

Methods: 20 cadavers were used. For the EL approach, the fibula and Achilles tendon were palpated and a line parallel to the plantar foot was drawn between the two. A vertical line (VL), representing the vertical limb of the approach, was drawn at the midway point as a perpendicular extending proximally from the junction of the glabrous/non-glabrous skin (JGNG). For the MEL approach, the anterior border of the Achilles tendon was palpated and a similar vertical line (MVL) was drawn 0.75 cm anterior. Dissection was performed and if the LCA was identified crossing the line VL/MVL, the distance from the JGNG was documented.

Results: For the EL approach, the LCA was identified in 17/20 (85%) cadavers at an average distance of 5.0 cm (range 3-7 cm, SD = 1.3 cm) from JGNG. For the ML approach, the LCA was identified in 4/20 (20%) cadavers at an average distance of 5.9 cm (range 3-6.5 cm, SD = 1.7 cm) from the JGNG (P < .001).

Conclusion: The LCA was encountered 4 times more often during the EL approach as compared to the MEL approach.

Schematic demonstrating the positioning of the EL and MEL approaches and the location of the lateral calcaneal artery in relation to the EL, MEL approach. (Red circles represent location of lateral calcaneal artery as it crosses the EL or MEL approach)

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