

Human The Distal Perforators Of Posterior Tibial Artery. A Study For The Correct Planning Of Medial Lower Leg Flaps

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The adipofascial flap, introduced by Lin in 1994 (1), has many advantages compared to fasciocutaneous or free flaps for lower limb reconstruction. Its dissection is relatively easy and fast with low donor site morbidity and it doesn't alter the shape of the leg. The aim of this dissection study is to evaluate the anatomic localization of the most distal perforator of the posterior tibial vessels to provide an anatomical rationale for the safe harvesting of distally based medial adipofascial flaps of the leg.

Thirty lower limbs from 15 cadavers were used for this study. In all the limbs, the femoral artery was cannulated. Different techniques of injection were employed. 26 specimens were injected with latex to fill the entire vascular network and ease dissection. 3 specimens were injected with a mixture of barium sulphate and gelatin and underwent a CT scan. CT scan dataset were used to make 3D reconstruction. They underwent anatomical dissection after the scan. 1 Specimen was injected with red epoxy resin mixed with barium sulphate (2). This technique is aimed to perform comparative anatomical vascular studies between CT three-dimensional reconstructions and traditional dissection techniques.

A distal perforator was found in all specimens; the mean caliber was 0.77 mm. In all cases, the perforator artery passed in the septum between flexor hallucis longus m. and flexor digitorum longus m. and was accompanied by two veins. In our series, the distance between the lowest perforator and the medial malleolus ranged from 3.5 to 8.2 cm. The median was 6.75 cm, the 5th percentile 4 cm and the 95th percentile 8.1 cm. The mean distance of the perforator from the medial tibial border was 1.23 cm. The mean ratio between the distance of perforator from the medial malleolus and the total leg length was 21%.

Compared to all previous researches (3), our study has found more distal perforators from posterior tibial perforator artery. This fact may have important clinical consequences because the anteromedial adipofascial flap would cover more distal soft tissue defects. Moreover, our data suggest some safety parameters to make the rising of a medial adipofascial leg flap safer in surgical practice.

References

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Keywords

Tibial artery, perforator flaps, injection techniques.