Perforators of the Lower Leg: Analysis of Perforator Locations and Clinical Applications of Pedicled Flaps

Reference:

Scientific Literature Review

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Podiatric Relevance
This article evaluates where the perforator arteries are in the lower leg through cadaveric study.

Methods
Twenty (20) fresh cadaveric lower limbs were used. The arteries were cleansed utilizing heparin sulfate and saline power flush at the level of the popliteal artery until the arterial tree was clear. Red latex was used to stain the arteries and blue used to stain the venae comitantes. The limbs were positioned in neutral and systematic incisions were made at ascending levels of the lower leg identifying every perforator artery larger than 0.5mm. These were then tagged for review.

Results
There was a conglomeration of perforator arteries at three distinct levels of the lower leg. The first group of perforating arteries was 4-9 cm proximal to the intermalleolar line. The second group was 13-18 cm proximal from the intermalleolar line and the last group was 21-25 cm proximal to the intermalleolar line. The anterior tibial artery had most of its perforators at the most distal level. The peroneal artery had most of its perforators at the 13-18cm level and the posterior tibial artery at the 13-18 and 4-9cm levels. Sagittally, the perforators of the anterior tibial artery were located between the tibia and tibialis anterior muscle. The peroneal perforators were found exiting between the flexor hallucis longus muscle and the peroneus brevis muscle. The posterior tibial perforators were found between the flexor digitorum muscle and the soleus muscle. The posterior tibial perforators were the largest vessels in diameter and the anterior tibial perforators were the most numerous.

Conclusions
There are three transverse 5cm intervals where conglomerations of perforator arteries may be best used for pedicled flaps.