

Figure 13.6 Cross-sectional anatomy of the lower leg. The four distinct compartments include the anterior compartment (tibialis anterior, extensor hallucis longus, extensor digitorum longus, deep peroneal nerve, anterior tibial artery); the lateral compartment (peroneus longus, peroneus brevis, superficial peroneal nerve); the deep posterior compartment (tibialis posterior, flexor hallucis longus, flexor digitorum longus, peroneal artery, posterior tibial artery, tibial nerve); and the superficial posterior compartment (soleus, gastrocnemius, plantaris). (Reprinted from Netter Anatomy Illustration Collection. ©Elsevier Inc. All Rights Reserved.)

tibial artery gives off cutaneous branches to the anteromedial and posterior part of the skin of the leg. In the upper third of the leg, the perforating vessels are mostly muscular and periosteocutaneous vessels. In the lower third, the perforating vessels are mostly direct septocutaneous and over the medial aspect of the Achilles tendon they are tendino-cutaneous. These cutaneous vessels, particularly in the distal one-third, can supply propeller flaps for medial malleolus coverage (see [Ch. 61](#)). The posterior tibial vessel passes posterior and medial to the medial malleolus. At this level, the posterior tibial artery is posterior to the tendon of the flexor digitorum longus muscle and anterior to the tibial nerve. In the foot it divides into the medial and lateral plantar arteries. Although technically possible, these branches are not commonly used for free flap anastomosis and arteries of the distal lower leg are preferred. The tibial nerve divides from the sciatic nerve within the popliteal fossa. It runs medial to the posterior tibial artery in the calf before passing posterior to the medial malleolus, where it is posterior to the posterior tibial artery and anterior to the tendon of the flexor hallucis longus muscle. Distal to the medial malleolus, it divides into the medial and lateral plantar nerves ([Figs 13.9, 13.10](#)).

EXPOSURE OF THE POSTERIOR TIBIAL ARTERY

The posterior tibial artery ([Fig. 13.13](#)) corresponds to a line joining: (1) a point, 2 cm medial to the calf's midline at the fibular neck level; and (2) a point, just posterior to the posterior edge of the medial malleolus. This line lies ~1 cm posterior to the posterior-medial border of the tibia. After making a skin incision along this line and through the subcutaneous tissue, the fascia cruris is incised. Further dissection continues posterior to the tibia, leaving the soleus muscle posterior and the flexor digitorum longus muscle anterior. If the surgeon sees the plantaris tendon, the plane between the gastrocnemius and soleus has incorrectly been opened ([Fig. 13.12](#)). Blunt dissection in the correct plane shows the posterior tibial artery and venae comitantes together with the tibial nerve between the soleus and flexor digitorum longus muscle. Distally, these structures run posterior to the medial malleolus below the flexor retinaculum, where the artery can be easily palpated. The anatomic structures from anterior to posterior are the tibialis posterior tendon, flexor digitorum longus tendon, posterior tibial vessels, tibial nerve, and flexor hallucis longus tendon.

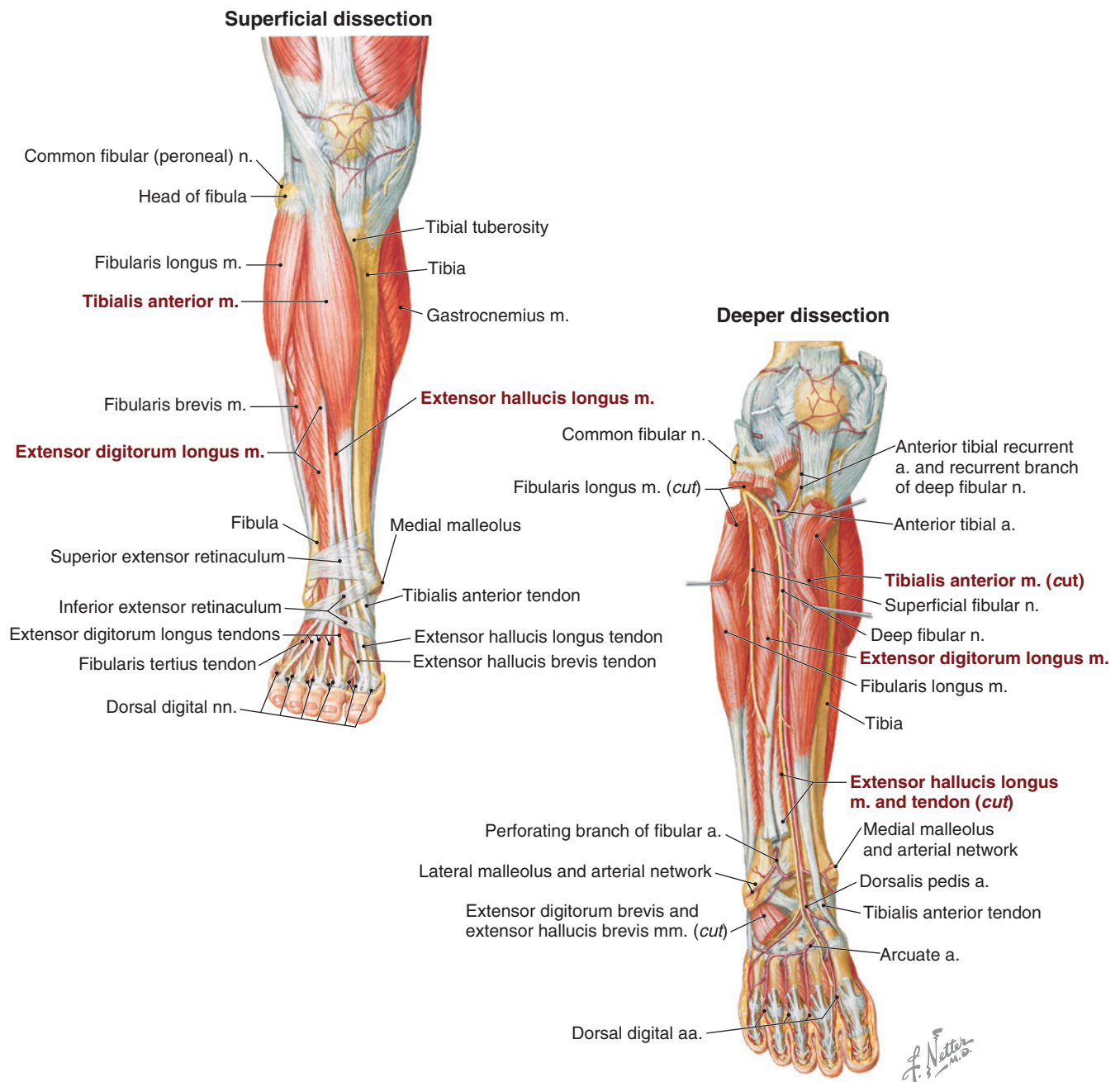


Figure 13.7 Anatomy of the anterior compartment. (Reprinted from Netter Anatomy Illustration Collection. ©Elsevier Inc. All Rights Reserved.)

PERONEAL ARTERY

The peroneal (fibular) artery arises from the posterior tibial artery on the surface of the tibialis posterior muscle, distal to the take-off of the anterior tibial artery. It descends posterior and medial to the fibula in the deep posterior compartment and terminates on the lateral surface of the calcaneus as the lateral calcaneal artery. Peroneal artery perforators are particularly prominent in the lower one-third of the lower leg. Perforators run within the intermuscular septum between the lateral and superficial posterior compartment, and supply the skin island for a fibula flap. Perforators 5 cm above the lateral calcaneus have anastomoses with the sural vessels to supply the reverse sural artery flap (see Ch. 48).

EXPOSURE OF THE PERONEAL ARTERY

The peroneal artery is uncommonly used as an inflow vessel because a fibulectomy is required for access. The peroneal artery can be accessed using an approach through the lateral and anterior compartments, similar to the approach to the fibula flap (Fig. 13.6). The peroneus musculature can be split to gain access to the lateral portion of the fibula. Dissection anteriorly along the fibula and then through the intermuscular septum will allow access to the anterior compartment and the interosseus membrane. The fibula can be cut proximally and distally and the interosseus membrane divided. This exposes the tibialis posterior muscle, which can be split to expose the underlying peroneal vessels.