

Fascial canal for the small saphenous vein

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The small saphenous vein is described in the standard text-books of anatomy as the continuation of the lateral marginal vein of the foot; it first ascends on the lateral border of the tendo-calcaneus in the superficial fascia and then along the middle of the back of the leg in the groove between the heads of the gastrocnemius. It pierces the deep fascia in the lower part of the popliteal fossa and ends in the popliteal vein (Brash, 1950; Wood Jones, 1950; Lockhart, Hamilton & Fyfe, 1959; Davies & Davies, 1962). In a study of eighty dissections the authors failed to confirm the description of the superficial course of the small saphenous vein.

OBSERVATIONS

The small saphenous vein was found lying in a fascial canal on the posterior aspect of the leg, extending from the lateral margin of the tendo-calcaneus to the popliteal fossa. This fascial canal was formed by the splitting of the deep fascia of the leg into a thick superficial and thin deep layer. Superiorly the superficial layer became continuous with the popliteal fascia. The thin deeper layer extended superiorly to a point where the two heads of gastrocnemius fused with each other. Above this level it was lost in the areolar tissue of the popliteal fossa. Inferiorly the two layers were lost beyond the lateral border of tendo-calcaneus in the areolar tissue behind the lateral malleolus. The width of the canal was 1–1.5 cm. In addition to the small saphenous vein, the fascial canal also contained sural nerve on its lateral side, superficial sural artery, lymphatics and the fat.

The small saphenous vein was found connected with the distal soleal sinusoidal system at a distance of 5 cm and 7.5 cm from the tip of the lateral malleolus. Bunning (1964) has reported a similar venous communication at a distance of 3.5 in from the tip of lateral malleolus.

DISCUSSION

The observation of a small saphenous vein running in a fascial canal might have an important bearing on the development of varicose veins, a disease peculiar to the human race and attributed to the erect posture. The veins which run in the superficial fascia are separated by a dense deep fascia from any possible support or compression by the muscles of the leg (Lockhart *et al.*, 1959). Also, these superficial leg veins contain relatively more blood than the deep veins and are subjected to the hydrostatic pressure which is controlled by the tone of the vessels, by support given by the muscles, the strong fascia and also in part by the skin. There is always a positive pressure in the leg veins in the erect posture. A disturbance in the controlling mechanism may lead to the development of the varicosity. Of the human race, 10%

suffer from varicosity of the lower limb (Rowden Foote, 1954); but only 2% suffer from the varicosity of small saphenous vein (Barrow, 1949). This lower incidence of varicosity of the small saphenous vein might be explained because it runs in a firm and inelastic canal formed by the deep fascia of the leg. According to Rowden Foote (1954) the vein, after piercing the deep fascia, runs for some distance under this unyielding tissue from which it gains considerable support which acts like a valve. Therefore a longer course of small saphenous vein in the fascial canal will give it even more support and protection against alteration in pressure from strain. On the other hand, the great saphenous vein, which runs in the superficial fascia, is subjected more to the back-pressure if the valves are incompetent or there is thrombosis of deep veins.

It is possible that the formation of the fascial canal for the small saphenous vein might be a protective mechanism to safeguard the vein against the compressing pressure resulting from the squatting posture.

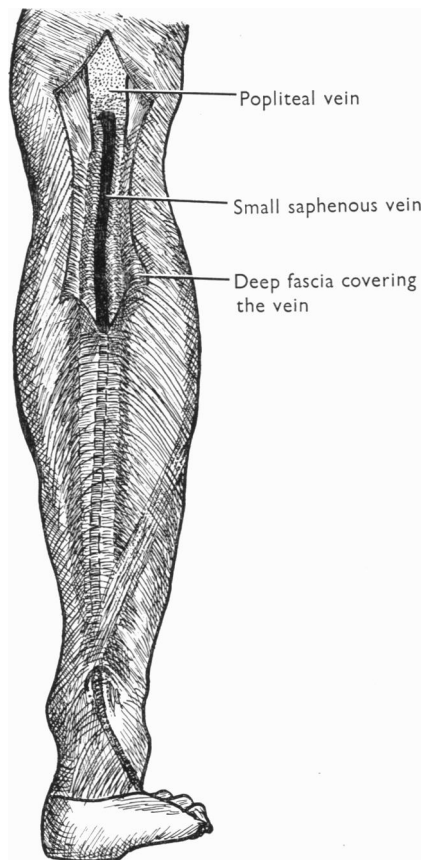


Fig. 1. The fascial canal for the small saphenous vein. The superficial layer of the fascial canal is split up in its upper part to show the vein. The other contents of the canal are not shown.

SUMMARY

The course of small saphenous vein in a fascial canal formed by the splitting of deep fascia of the leg is described. This anatomical arrangement might explain the infrequency of the varicosity of the vein.

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