

AN UNUSUAL POPLITEAL VEIN AND ITS CLINICAL SIGNIFICANCE

Dear Sir,

It is generally recognised by both surgeons and gross anatomists that considerable variation exists in venous anatomy. Many of the anatomy textbooks, including Williams et al and Gray,^(1,2) generally provide simplified descriptions of the veins of the lower extremity. Also, the anatomical literature contains relatively few reports on variations in the veins of the popliteal region.⁽³⁻⁵⁾ Several reports have implicated popliteal venous ligation as a contributing factor to lower extremity amputations in patients with popliteal venous trauma.⁽⁶⁾

The popliteal fossae of 24 lower extremities of embalmed cadavers were dissected, with the knees fixed in the extended position. The dissection was carried out for undergraduate medical students in the Department of Anatomy, Kasturba Medical College, Manipal University, India. After removal of the skin, superficial fascia and adipose tissue, the gastrocnemius, soleus and hamstring muscles were reflected to expose the arteries and veins within the popliteal fossa. The course of the popliteal vein from the level of the distal edge of the adductor hiatus to the proximal portion of the leg was seen and photographed.

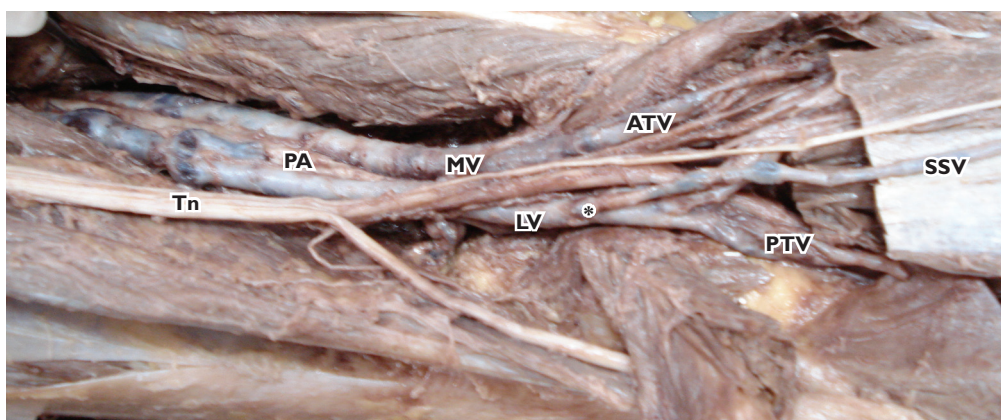


Fig. 1 Photograph shows the unusual popliteal vein with medial and lateral veins in the popliteal fossa. The termination of the small saphenous vein into the lateral vein can also be seen in the picture. MV: medial vein; LV: lateral vein; PA: popliteal artery; Tn: tibial nerve; SSV: small saphenous vein; ATV: anterior tibial vein; PTV: posterior tibial vein; * indicates the termination of the small saphenous vein into the lateral vein in popliteal fossa.

One (male gender, left side) of the 24 popliteal fossae showed a variation in its formation (Fig. 1). The percentage of occurrence of variation observed is 4.2%. The popliteal vein is formed proximal to the femoral condyles by a medial and lateral vein. The lateral vein received the posterior tibial vein as a direct tributary, and the diameter of the medial vein is almost double that of the lateral vein. The small saphenous vein was seen to be draining into the lateral vein, whereas the medial vein received the anterior tibial vein as a direct tributary. A metric ruler was used to obtain the length and external diameter of the variable pattern of the popliteal vein from its site of origin to the junction of the medial and lateral veins of the popliteal fossa, to the adductor hiatus. The following are the appropriate sizes of the parts described:

Length of the lateral and median veins from their formation to the adductor hiatus: 16.9 cm.

External diameter of the lateral vein: 0.7 cm.

External diameter of the medial vein: 1.3 cm.

The variable pattern of popliteal vein formation presented in this case strengthens the previous research by Williams and Cross et al.^(3,5) This variation should be of great value to the surgeon operating for traumatic injury in the popliteal fossa. The standard operative approach to popliteal fossa is from a medial skin incision. The medial vein is usually larger than the lateral vein and frequently ligated.⁽³⁾ If a lateral vein or interconnecting veins are present, venous ligation of an injured medial vein may be well tolerated. If the venous injury involves a single popliteal vein without extensive collateral veins, ligation may lead to extremity oedema or ischaemia.

It is hoped that this report may provide detailed information for anatomists and surgeons performing procedures in the popliteal region, such as atherosclerotic peripheral vascular disease, Baker's cyst and popliteal aneurysm.

Yours sincerely,

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REFERENCES

1. Williams PL, Bannister LH, Berry MM, et al; eds. Gray's Anatomy. 38th ed. Edinburgh: Churchill Livingstone, 1995:1568, 1597.
2. Gray H. Anatomy of the Human Body. 30th Am ed. Philadelphia: Lea and Febiger, 1985:769-70, 849-50.
3. Cross L, Hall J, Howdieshell TR, Colborn GL, Gale TF. Clinical anatomy of the popliteal blood vessels. Clin Anat 2000; 13:347-53.
4. Picqué R, Pigache R. Contribution a l'étude des veines profondes du membre inferieur. J Anat et Physiol 1909; 45:537-64.
5. Williams AF. The formation of the popliteal vein. Surg Gynecol Obstet 1953; 97:769-72.
6. Phifer TJ, Gerlock AJ, Rich NM, McDonald JC. Long term patency of venous repairs demonstrated by venography. J Trauma 1985; 25:342-6.