Case Report
Anatomy

A RARE VARIATION OF PROFUNDA FEMORIS VEIN DIRECTLY COMMUNICATING WITH POPLITEAL VEIN

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SUMMARY: During dissection of the posterior compartment of the thigh of a female formalin-fixed cadaver, a variation of profunda femoris vein directly communicating with the popliteal vein was encountered on the right side. The profunda femoris vein was 18 cm long with a diameter of 0.5 cm. Such a direct communication between the profunda femoris vein and popliteal vein is known to be rare.

The site of the thrombosis that develops in the lower limbs is of importance in terms of diagnosis and treatment. Proximal or distal placement of such a thrombosis leads to diversity of diagnosis and treatment. Thus variations related with the veins of the lower limb should be well known. Furthermore awareness of such variations may be important to avoid unexpected complications during surgery of this region.

Key Words: Profunda femoris vein, variation, cadaver, deep vein thrombosis (DVT)

INTRODUCTION

Venous anatomy is known to be highly variable (1,2). It is important to know not only the normal anatomy but also the variations of deep veins of the lower limb in detail since deep vein thrombosis (DVT) primarily occurs in this part of the body (3,4). Severe complications like pulmonary thromboembolism (PTE) make this medical condition more important as its prevalence increases after the age of 40, and it is responsible for 10% of the deaths that occur in hospitals. The location of the thrombosis within the vein leads to diversity of diagnosis and treatment (3). Profunda femoris vein drains into the femoral vein 4-12 cm below the inguinal ligament (5-8) (Figure 1). For its entire length, it extends in front of the deep artery of the thigh (6). It has tributaries corresponding to the branches of the artery (6-9). Through these tributaries it is proximally connected to the inferior gluteal artery, and distally connected to the popliteal vein (6).

CASE

During routine dissection, we encountered a connective vein with a length of 18 cm and a diameter of 0.5 cm in the posterior compartment of thigh, on the right

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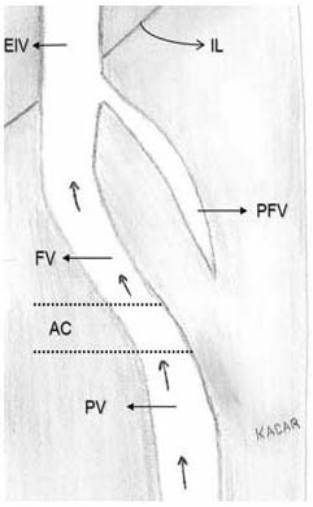

Figure 1: Schematic anatomy of normal right posterior femoral venous structure. IL: Inguinal ligament, FV: Femoral vein, AC: Adductor canal, EIV: External iliac vein, PA: Popliteal artery, PV: Popliteal vein, PFV: Profunda femoris vein.

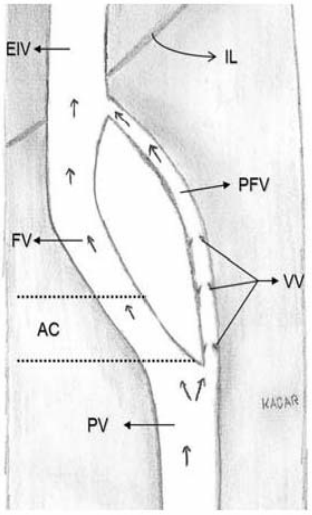

Figure 3: Schematic anatomy of the direct connections of the venous structure in the right thigh. IL: Inguinal ligament, FV: Femoral vein, AC: Adductor canal, EIV: External iliac vein, PA: Popliteal artery, PV: Popliteal vein, PFV: Profunda femoris vein, VV: Venous valves.

side of a 65-year-old female formalin-fixed cadaver. This vein directly anastomosed with the popliteal vein distally (Figure 2). On examining its course in detail, we identified the profunda femoris vein, which proximally drained into the femoral vein 10 cm below the inguinal ligament. It lied deep to the long head of the bicep femoris and the semitendinosus muscles. Distally it was in the popliteal fossa and directly connected to the popliteal vein (Figures 2 and 3).

Figure 2: Dissection of right posterior femoral region. CFN: Common fibular nerve, LSCN: Lateral sural cutaneous nerve, MSCN: Medial sural cutaneous nerve, SN: Sural nerve, PA: Popliteal artery, PV: Popliteal vein, PFV: Profunda femoris vein.

DISCUSSION

The very first studies related with the deep veins of the lower limb dates back to five or six decades ago (8, 10, 11). Popliteal vein and the formation of the varices of this vein were the more frequent subjects to be studied (12).

The communication of the profunda femoris vein with the lower part of the femoral vein (10) and with the popliteal vein (11) was previously reported in the literature. In the present case, the profunda femoris vein constituted a direct communication between the popliteal and the femoral veins. Jiji *et al.* (7) and Sujahta *et al.* (13) had reported similar variations to our case. In both of these cases, profunda femoris vein drained into the femoral vein proximally, whereas it directly anastomosed with the popliteal vein distally on the right side (7, 13). Although in these studies the described variations were reported to be rare, Mavor and Galloway reported the ratio of direct connection between profunda femoris vein and the popliteal vein as 38%(11).

Natsis *et al.* (9) reported such a variation stating that it represented the embryonic axial vein. They suggested that this vessel constituted a collateral pathway in the case of obstruction of femoral vein. Moreover they stated that in such an obstruction case, this embryonic axial vein is easily mistaken for the femoral vein (9).

Thus, knowledge of the venous anatomy of the lower

limb and its variations is of great importance not only in radiologic imaging modalities for the diagnosis of DVT but also in the surgery related with this part of the body in terms of avoiding complications.

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