

**Original article:**

**Double superficial femoral vein with double popliteal vein: A cadaveric study**

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**Abstract:**

Variations are common in the lower limb veins due to complex embryological development of the Vascular system. In this study, we came across double Superficial femoral vein and double Popliteal vein in the same cadaver in the same limb (right limb), during dissection for the undergraduate students. Variations in the venous anatomy of lower limbs have important clinical implications because it can lead to potential complications like Deep vein thrombosis.

**Key words:** Superficial femoral vein, Popliteal vein, Variations, Deep vein thrombosis, Venae comitantes

**Introduction:**

The Popliteal vein ascends through the Popliteal fossa between the Tibial nerve and Popliteal artery, to the opening in the Adductor magnus where it becomes the Superficial femoral vein. Thereafter it accompanies the Femoral artery,ascends in the femoral triangle to the inguinal ligament from where it continues as External iliac vein. Several researchers studied the anatomical variations of the lower limb veins with use of Cadavers, Venograms and with Duplex imaging. Variations are frequent in the lower limb venous system and are also of great clinical importance. Duplications of deep veins are more prone for complications like Deep vein thrombosis. Therefore knowledge about anatomical variations of

deep veins is necessary to avoid potential sequelae following interventional procedures.

**Materials and methods:**

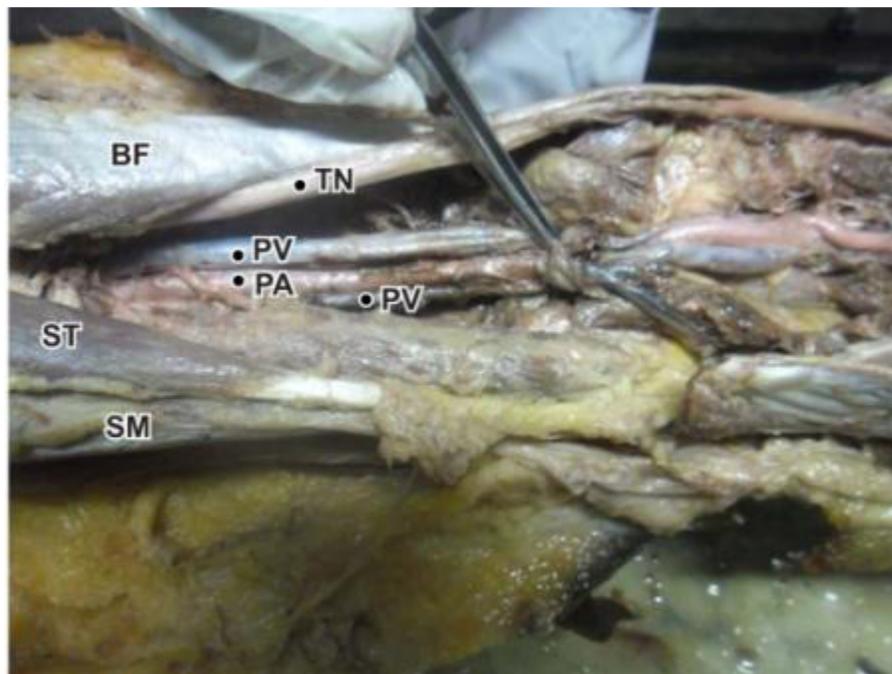
The dissection of 40 lower limb specimens obtained from adult cadavers was performed during 2012, for undergraduates in the department of anatomy, Stanley medical college, Chennai -600001. The dissection was done in Formalin preserved cadavers, according to the methodology given by Cunningham's Manual of Practical Anatomy.

**Observation:**

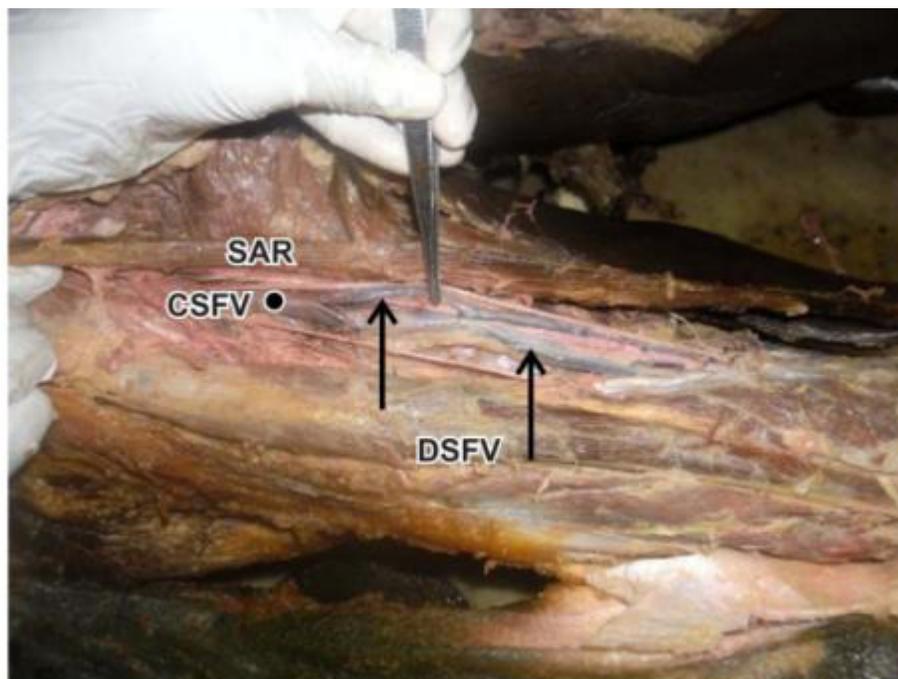
Out of the 40 lower limb specimens, 1 limb( 2.5 %) presented a pattern of double popliteal vein and double superficial femoral vein in the right limb of a male cadaver. But the left limb was showing the normal pattern.

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**Fig. 1 Double Popliteal Vein accompanying Popliteal Artery – Right Popliteal fossa**



**Fig. 2. Double Superficial Femoral Vein – Right Femoral Triangle**

**Discussion:**

The Popliteal vein is formed by the union of the venae comitantes of the Anterior and Posterior tibial arteries, ascending through the aperture in the Adductor magnus it continues as Superficial femoral vein. In Last's anatomy(2011), it has been stated that the Popliteal vein may take the form of venae comitantes on either side of the artery. In Hollinshed's textbook of Anatomy(1995), it has been mentioned that the lower end of the Popliteal vein is doubled or the vein divides into two vessels proximally. According to E.Dona et al (2000), duplications were found in 15.7%. Out of this, 775 involved only Superficial femoral vein, 18% involved both Superficial femoral and Popliteal vein, 5% only the Popliteal vein. In a radiological study, done by Daniel J.Quinlan et al(2003), Duplicated Popliteal vein were found in 42% and Duplicated Superficial femoral vein in 31%. J.F.Uhl et al (2010) studied venous anatomy on fresh non embalmed cadavers concluded that the prevalence of Duplicated Superficial femoral vein is variable from 12% to 46%. A.Sadowska(2013) et al observed 7.8% of duplicated Popliteal vein in their cadaveric study. Paraskevas (2011) in his radiological study, found Femoral vein duplication in 41% of cases. Out of this

42% were bilateral and 57 % were unilateral. Poynter (1922) found Double Popliteal vein in 40% of his subjects. Gordan A.C (1996%) found Double Femoral vein in 25% of cases and Screamon NJ(1998) in 46% of cases in their Venographic studies. Bronzi G et al (1989) presented a case report of Thrombosis of congenital Double Popliteal vein. Punita Sharma (2011) and Deepali Onkar(2015) presented case reports with Duplicated Superficial femoral vein. In the present study (2012), the incidence of Double Popliteal vein with Double Superficial femoral vein is 2.5%, which was found in the same limb of a male cadaver. The other limb was showing the normal pattern.

**Conclusion:**

Deep veins especially of the lower limbs has been widely used as Vascular substitutes. Deep vein thrombosis is more common in cases of Duplication of Popliteal and Superficial femoral veins due to changes in their flow velocities. Serious complications of Deep vein thrombosis like Pulmonary embolism can lead to death. It is therefore important to rule out deep venous anatomical variations before doing any interventional procedures to avoid catastrophic sequelae.

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