International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Website: https://ijmpr.in/

Case Report

Unilateral Variation in Origin and Course of Profunda Femoris: A Case Report

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OPEN ACCESS

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Received: 14-03-2026
Accepted: 06-04-2026
Published: 24-04-2026

ABSTRACT

Profundafemoris artery and its circumflex branches are encountered during cannulation of femoral artery of various clinical and diagnostic techniques. Anatomical knowledge of the variations of femoral artery and its branches is therefore required to minimize complications. We report a case of unilateral variation in origin and course of profundafemoris: a case report during routine dissection of lower limbs of old female cadaver. These variations may be due to the divergence in the mode and proximal distal level of branching of aberrant vessels that connect with principal vessels, or codes or plexuses.

Abbreviations: PFA – Profundafemoris artery, FA – Femoral artery, LCF – Lateral circumflex femoral artery, MCF – Medial circumflex femoral artery, IL – Inguinal ligament.

Keywords: *Profunda femoris artery variation, Femoral artery cannulation, Circumflex femoral branches, Anatomical variation, Cadaveric dissection.*

INTRODUCTION

PFA is the largest deep branch of (FA) which arises from the postero-lateral aspect of FA about 3.5–4 cm distal to the inguinal ligament. It is the main artery which supplies all three compartments of the thigh.[1,2,3] It gives MCFA, LCFA, four perforating arteries and muscular branches. At first lateral to the FA, it spirals posterior to this and the femoral vein to reach the medial side of the femur, and provides the principal supply to the adductor, extensor, and flexor muscles.

OBJECTIVE

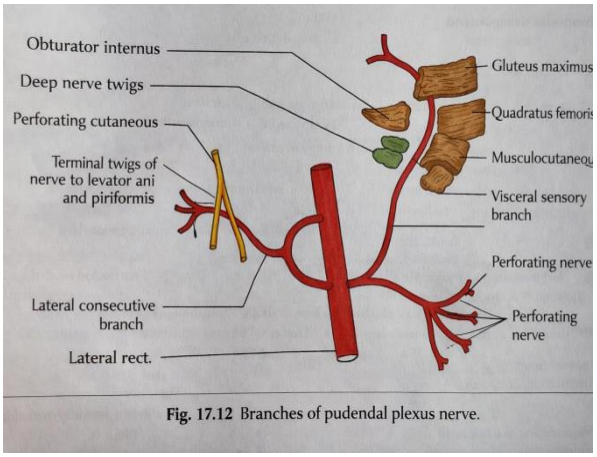
The aim of this study is to provide awareness of anatomical variations in the origin of PFA and to discuss its embryological basis and clinical insight of this variation along with a relevant review of the literature.

METHODOLOGY – CASE REPORT

During educational dissection in the Department of Anatomy of BSMC, we observed in a female cadaver of about 80 years a rare variation of the PFA originating from the posteromedial side of the femoral artery just beneath the inguinal ligament and coursing in front of the femoral vein on the left side of the thigh. The medial circumflex femoral artery, a branch of PFA which usually originates posteromedially and winds around the medial side of the femoral shaft, is arising medially from the PFA.

FIG. 1: SHOWING HIGHER ORIGIN OF PROFUNDAFEMORIS ARTERY FROM POSTEROMEDIAL ASPECT OF FEMORAL ARTERY - LEFT LIMB

FIG. 2: SHOWING ORIGIN OF 1ST PERFORATING ARTERY OF PROFUNDAFEMORIS ARTERY FROM POSTEROMEDIAL ASPECT OF FEMORAL ARTERY - LEFT LIMB



PFA-PROFUNDAFEMORIS ARTERY, FA FEMORAL ARTERY, LCF-LATERAL CIRCUMFLEX FEMORAL ARTERY, MCF-MEDIAL CIRCUMFLEX FEMORAL ARTERY, IL-INGUINAL LIGAMENT

EMBRYOLOGICAL BASIS

The femoral artery develops from the capillary plexus (rete femorale), which is connected with the external iliac artery proximally through the rete pelvicum and the axis (sciatic) artery distally. The dorsal root of the umbilical artery gives rise to the axis artery of the lower limb. The PFA develops within the rete femorale and appears as a branch of the femoral artery after regression of the rete femorale. Anatomical variations in the origin of the PFA occur due to variability in the pattern of regression of the rete femorale, and it is accepted that increased blood flow in these capillaries determines the final mature arterial pattern. Thus, the most appropriate channels enlarge while others contract and disappear.[9,10] PFA is a branch of the internal iliac artery in lower animals, but during evolution, its origin shifted distally as a branch of the femoral artery. So, "ontogeny recapitulates phylogeny." Hence, arrest at various developmental stages may lead to anatomical variations related to the division of the femoral artery.[8]

DISCUSSION

Variations may not endanger the life of patients and they are usually subclinical, but knowledge of variation in the origin of PFA and its branches is of great significance for preventing flap necrosis, particularly tensor fasciae latae, when used in plastic and reconstructive surgery, and also important for vascular surgeons and interventional radiologists.[4,6] This knowledge is also essential in the surgical repair of femoral hernias and in vascular reconstructive procedures in the proximal leg. Plastic surgeons use the muscular branches while incorporating myocutaneous flaps. This vessel is useful for Doppler imaging, ultrasonography, arteriography, angiography, and MRI.[5,7] The knowledge of the site of origin of PFA is important while performing clinical procedures in the femoral region and in hip joint replacement, and also for avoiding iatrogenic arteriovenous fistula or severe secondary hemorrhage while performing femoral artery puncture.[8] The different anatomical relationships and lack of knowledge of variations of these vessels make hemostasis difficult to manage.[3] The lateral circumflex femoral artery, a branch of the PFA, is useful for aorto-popliteal bypass and anterolateral thigh flap.[7] If the FA is ligated proximal to the origin of PFA, collateral circulation is established through anastomosis between the branches of PFA and external and internal iliac arteries in the following situations: a) at cruciate anastomosis b) at trochanteric anastomosis c) at spinous anastomosis d) around the origin of obturatorexternus e) in the perineum.

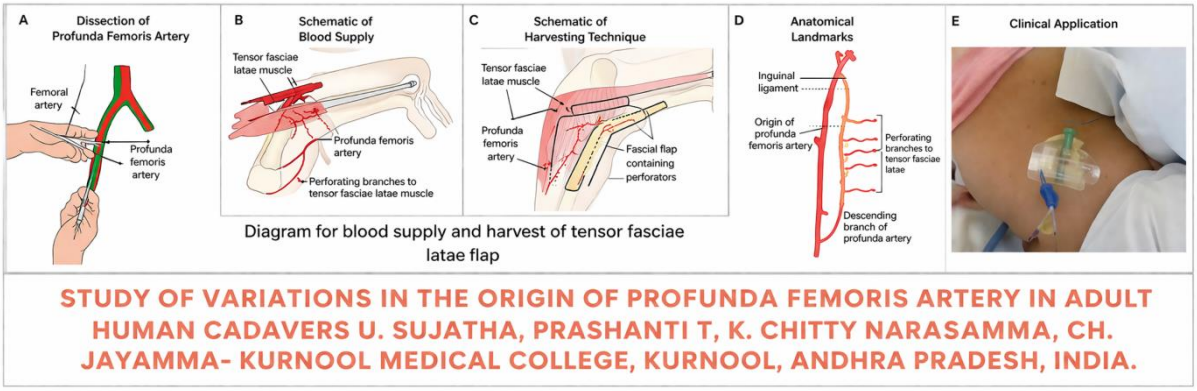
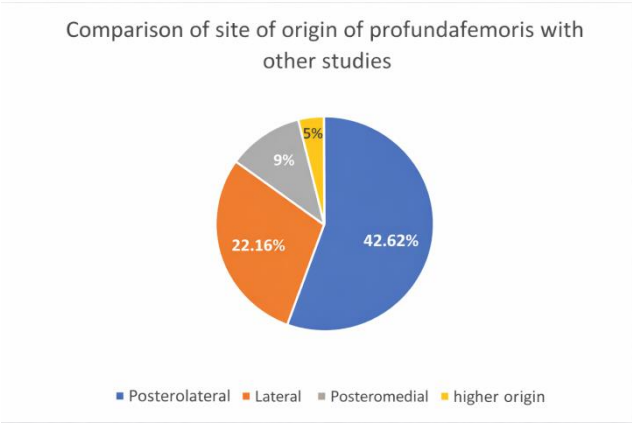


Diagram for blood supply and harvest of tensor fasciae latae flap

STUDY OF VARIATIONS IN THE ORIGIN OF PROFUNDA FEMORIS ARTERY IN ADULT HUMAN CADAVERS U. SUJATHA, PRASHANTI T, K. CHITTY NARASAMMA, CH. JAYAMMA- KURNOOL MEDICAL COLLEGE, KURNOOL, ANDHRA PRADESH, INDIA.



CONCLUSION

Profundafemoris artery shows variation in its origin, course, and branching pattern. It acts as a collateral vessel in occlusion of the femoral artery. When the origin is high, it can cause problems during femoral arterial or venous puncture, embalming, and various interventional procedures or femoral nerve block. Before any procedure involving the femoral artery, high-resolution ultrasonic imaging should be performed to provide anatomical and functional information, which would help in planning various procedures. Therefore, precise knowledge of normal and variant anatomy of PFA is important for surgeons, clinicians, radiologists, and anatomists.

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