



**VARIATION IN THE BRANCHING PATTERN OF FEMORAL ARTERY IN A MALE
CADAVER: A CASE REPORT**

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ABSTRACT

Femoral artery entered the femoral triangle deep to the inguinal ligament. It gave lateral circumflex femoral artery (LCFA) immediately below the inguinal ligament passes deep to the femoral nerve without dividing it, branches into descending and transverse. Transverse branch again divided into ascending and lateral branch. About 3 cm below the inguinal ligament femoral artery gave profunda femoris artery (PFA) from its posteromedial side. PFA ran downward behind the femoral artery and vein, underwent a straight course ends by piercing adductor magnus. PFA gave medial circumflex femoral branch about 5 cm below the inguinal ligament from its medial side and 3 perforators. Remaining course and branches of femoral artery was normal. Knowledge of site of origin of branches of femoral artery is important in arteriography, hip replacement surgeries. Its circumflex branches used in vascular reconstructive and coronary artery bypass surgeries. This case report may be useful for surgeons and radiologists.

KEYWORDS: Axis artery, arteriography, circumflex branches, Femoral artery, perforators, profunda femoris,

INTRODUCTION

Femoral artery, a continuation of External iliac artery enters the femoral triangle deep to the midinguinal point. Part of the artery, proximal to the branching of the profunda femoris, called as common femoral artery (CFA). It is superficial in position can be palpated and easily accessible, used for a number of clinical procedures. CFA gives superficial epigastric artery, superficial circumflex iliac artery, superficial and deep external pudendal branches.^[1]

Profunda Femoris artery (or deep artery of thigh) is the largest branch of the femoral artery. Chief artery of thigh arises from the lateral or posterior side of the femoral artery. Most common site of origin of profunda femoris artery is from the posterolateral aspect of the femoral artery.^[2] Profunda femoris artery gives medial and lateral circumflex branches and 3 perforators. It ends by piercing the adductor magnus as 4th perforator supplies medial, posterior and lateral compartment of thigh.

Femoral artery and its branches used for arteriography, cardiac catheterisation and vascular reconstructive surgeries. It is important to know about the branching pattern and course of femoral arteries. Here we are reporting a case of variation in branching pattern of

femoral artery which will be useful for surgeons and radiologists.

CASE REPORT

During routine dissection classes of undergraduate medical students at ESIC medical college Gulbarga Karnataka India, a 50 year old male cadaver showed variation in the branching pattern of femoral artery. It gave lateral circumflex femoral artery (LCFA) immediately below the inguinal ligament passes deep to the femoral nerve without dividing it, branches into descending and transverse. Transverse branch again divided into ascending and lateral branch (**Fig 1**). Profunda femoral artery (PFA) arose from posteromedial aspect femoral artery 3cm below the inguinal ligament (**Fig 2**). It descended behind the femoral artery and vein underwent a straight course, accompanied by corresponding vein in its medial side in upper part and behind in lower part. PFA gave medial circumflex femoral artery (MCFA) from its medial side (**Fig 2**) about 5 cm below the inguinal ligament and 3 perforator arteries. It ended by piercing the adductor magnus as 4th perforator. Medial circumflex femoral branch ran behind the femoral vein and leaves triangle passing between psoas and pectineus muscle. Remaining course and branches of femoral artery was normal.

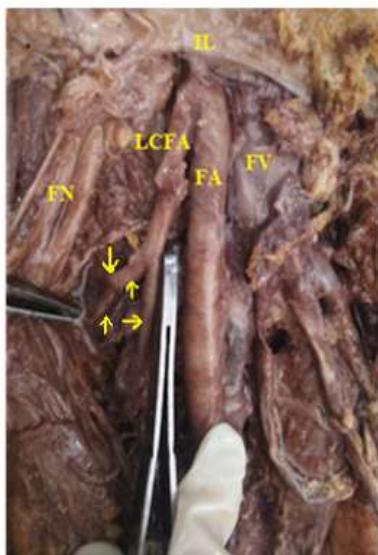


Fig 1: shows lateral circumflex femoral artery(LCFA) branching from femoral artery just below the inguinal ligament(IL), branches of LCFA(yellow arrow), FN-femoral nerve.

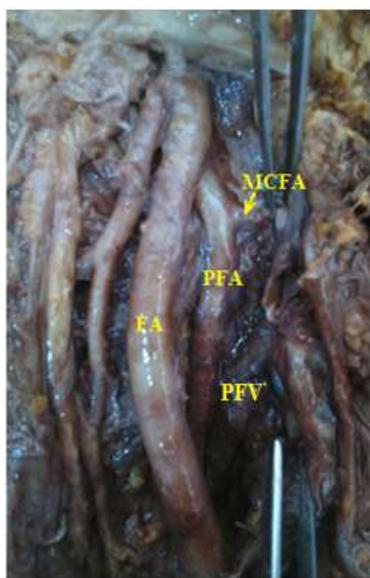


Fig 2: Shows branching of profunda femoris artery(PFA) from postero-medial side of Femoral artery (FA) and medial circumflex femoral artery (MCFA) from PFA, PFV-Profunda femoris vein

DISCUSSION

Lower limb arteries develop from the axis artery which grows out from the dorsal root of umbilical artery, differentiates into 3 parts proximal as sciatic, middle deep popliteal, and distal interosseous arteries. At the same time external iliac artery sprouts from the umbilical artery. Proximal part of femoral artery develop from the external iliac artery, middle part of femoral artery and the profunda femoris branch develop from the ventral arterial plexus called rete femorale and distal part by ramus communicans superior of the sciatic artery. Continued growth of femoral, popliteal and profunda

femoral arteries diverts the blood flow from the axis artery, most of which undergoes regression.^[3] Complex developmental process and developmental arrest at any stages may lead to congenital anomalies and variations of the arteries.^[4,5] It is also opined that increase of blood flow in these capillaries determines the final mature arterial pattern.^[6]

In one of the study of 228 femoral triangle, origin of profunda femoris from posterolateral aspect of femoral artery in 42.1%, posterior aspect in 28.5%, lateral side in 18.8% and from the medial side in 10.5% of cases were found^[2]. Out of 120 femoral triangle dissection, origin of PFA from posterolateral aspect in 29(48.33) on right, 28(46.67%) on left, posterior aspect in 12(20%) on right and 14(23.33%) on left, lateral aspect in 11(18.33%) on right and 9(15%) on left, medial side in 8(13.33%) cases on right side and 9 (15%) cases in left side were noted.^[7]

Site of origin of profunda femoral artery is important, now a day's PFA used for haemodialysis, Doppler imaging, arteriography, digital subtraction angiography, ultrasound, magnetic resonance instead of femoral artery^[8] and its branches used for breast reconstruction surgeries.^[9] Profunda femoral artery provides a collateral blood pathway in atherosclerotic occlusive disease. This collateral pathway is more important if aortoiliac lesions are associated with femoropopliteal lesions.^[10] PFA is frequently incorporated in vascular reconstructive surgeries^[11]

MCFA supplies blood to the head and neck of femur, adductor muscles and to fatty tissue in the acetabular fossa. Branching pattern of MCFA is important when performing trochanteric & intertrochanteric osteotomies, to prevent iatrogenic vascular necrosis of femoral head in reconstructive surgery of the hip and fixation of acetabular fractures through the posterior approach.^[12,13] Origin medial circumflex femoral artery from PFA recorded in 56.1%(64) on right and left 66.7%(76)^[2], in 59%⁴, in 67.2%(43)^[5], in 65%(39) on right and 60% (10) on left^[7], in 40 % on right side and 60 % on left side^[14], cases respectively.

In this case LCFA arose from femoral artery just below the inguinal ligament proximal to the origin of PFA a rare variation. High branching of LCFA from femoral artery will be wider in calibre which can be mistaken for the profunda during surgical and therapeutic interventions.^[14] Origin of LCFA from femoral artery was noted in 7.8%(9 cases)^[2], in 15.6 %^[4], in 18.75%(12)^[5] and in 20%(4) on right and 25%(5)^[14] on left cases respectively. Site or origin and branching pattern of LCFA is important, used in coronary artery bypass surgeries^[15] and to correct large defects in the face due to gunshot wounds.^[16] Descending branch of the lateral circumflex femoral artery can be used as a high flow conduit for extracranial intracranial bypass surgery.^[17]

CONCLUSION

In this case we are reporting a variation in the branching pattern of femoral artery which gave LCFA just below the inguinal ligament and PFA from its posteromedial side a rare variation. Site of origin of femoral branches are important in various clinical procedures to reduce the risk of damaging vessels during arteriography, hip replacement surgeries. This report may be useful for vascular surgeons and radiologists.

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