



## Diversified Origin of Profunda Femoris Artery and its Branches

### KEYWORDS

femoral artery, profunda femoris, inguinal ligament, femoral nerve

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**ABSTRACT** Profunda femoris is the largest branch of femoral artery. It gives lateral circumflex artery, medial circumflex artery and three perforator branches and continues as fourth perforating artery. The present study was done on 40 embalmed limbs to know variations in the origin and branching pattern of profunda femoris artery. In this study highest origin of profunda was observed in one limb and profunda femoris took origin from the medial side of femoral artery along with medial circumflex femoral artery in another limb. In the same limb the lateral circumflex artery is the lateral branch of femoral artery. Knowledge of variations of arterial system of lower limb is important before planning diagnostic and therapeutic interventions.

### Introduction

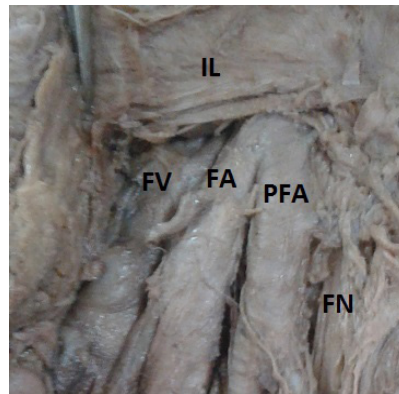
Profunda femoris artery is the largest branch of femoral artery. It arises from posterolateral to femoral artery 3-4 cm distal to inguinal ligament. It is the major source of blood supply to medial and posterior compartment of thigh. It gives lateral circumflex artery that divides the femoral nerve into anterior and posterior divisions, medial circumflex femoral artery that supplies medial compartment and hip joint, later it gives three perforating branches and continues as fourth perforating artery. All these perforators pierce adductor magnus muscles and form a chain of anastomosis on the back of thigh. Embryological unusual arterial persistence leads to anomalous branching patterns that are clinically significant. So knowledge of variations is important during vascular diagnostic interventions and also helps in reducing intra operative secondary hemorrhages.

### Materials and Methods

The present study was done on 40 embalmed lower limbs. Variations in the origin of profunda femoris artery and its branching pattern was observed while performing dissections for undergraduate medical students. During dissection the contents of femoral triangle- femoral artery, femoral vein and femoral nerve were exposed. The branches of femoral artery were studied in detail.

### Observations

The femoral artery is continuation of external iliac artery at mid inguinal point. It enters the thigh and gave the branches. In one limb profunda femoris, the big branch of femoral artery took its origin just below the inguinal ligament. This high origin profunda showed normal branching pattern having lateral, medial circumflex femoral artery and perforator branches (fig.1). Rest of the branching pattern of femoral artery was normal.



**Figure-1** showing high origin of profunda femoris artery

(IL-Inguinal Ligament, FA-Femoral artery, PFA-Profunda Femoris Artery, FN-Femoral Nerve, FV-Femoral Vein)

In another limb, there was a common trunk for profunda femoris and medial circumflex femoral artery from medial side of femoral artery. After giving medial circumflex femoral artery the profunda passed deep to femoral vein. The caliber of profunda is larger compared to femoral artery. The course and branching pattern of profunda femoris was normal (fig.2). The lateral circumflex femoral artery took origin from lateral side of femoral artery along with muscular branches. This lateral circumflex branch passed deep to femoral nerve instead of passing between two divisions of femoral nerve (fig.3)

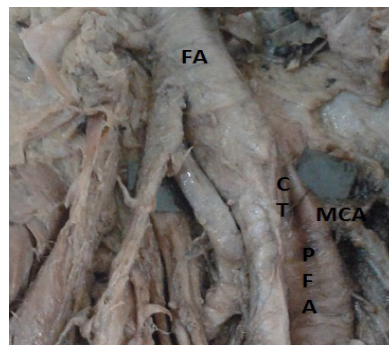


Figure-2 showing common trunk for profunda femoris and medial circumflex femoral artery (FR-Femoral artery, PFA-Profunda Femoris Artery, CT-Common Trunk, MCA-Medial Cicumflex Artery)

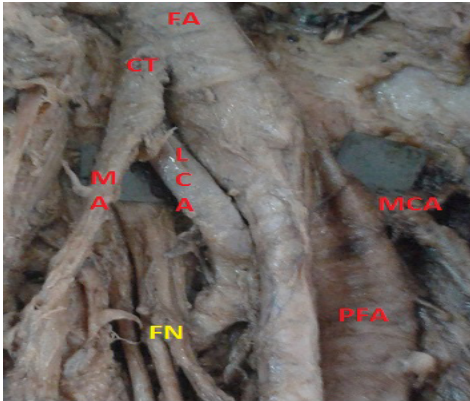


Figure-3 showing LCFA passing behind femoral nerve (FR-Femoral artery, PFA-Profunda Femoris Artery, FN-Femoral Nerve, CT-Common Trunk, MA-Muscular Artery, LCA-Lateral Cicumflex Artery, MCA-Medial Cicumflex Artery)

### Discussion

Development arrest at different stages of vascular system leads to anatomical variations that are clinically significant. The origin of profunda femoris artery is postero lateral, posterior followed by lateral and posteromedial to femoral artery. Variations in the origin of this artery was described in the literature. The highest origin of profunda femoris at or above the inguinal ligament was described by authors.(1,2) Shankar in his study found this vessel less than 1cm distal to the inguinal ligament.(3) Quain found the high origin in one out of 431 cases just above the inguinal ligament, in seven cases just deep to the inguinal ligament, and in 13cases within half an inch below the ligament.(4) This highest origin is a threat to procedures like femoral vessel puncture and nerve block

Daskha dixit study on 228 femoral triangles described a common trunk for medial circumflex femoral artery and profunda femoris(5). Eswasri described the origin of lateral circumflex femoral artery and medial circumflex femoral artery directly from femoral artery(6).Knowledge of varied origins of medial circumflex femoral artery is essential to avoid iatrogenic vascular necrosis of head of femur in reconstructive surgery of hip.(7) Profunda femoris artery acts as a collateral vessel in occlusion of femoral artery ,due to this it may have a larger caliber(8) The commonest site of origin of lateral circumflex femoral artery bilaterally was from the lateral aspect of profunda femoris artery. Uzel M et al studied 110 inguinal regions and found lateral circumflex femoral artery arising from profunda femoris artery in 85 cases and from femoral artery including common stem in 25 cases(9). Baptist M et al have also reported the origin of lateral circumflex femoral artery from the femoral artery.(10) The position of lateral circumflex femoral artery is an important landmark for femoral nerve block as it passes between its divisions,so the varied origins of lateral circumflex is clinically important.(11)

### Conclusion

The variations of the origin of profunda femoris artery from the femoral artery can become a matter of great concern to orthopedic surgeons, radiologists, plastic surgeons. The lateral circumflex femoral artery is used as breast recon-

struction after mastectomy. The anatomical knowledge of the level of origin is important in avoiding iatrogenic femoral arteriovenous fistula formed during puncture of femoral artery. Thus anatomical variations of the profunda femoris artery and its branches have significant clinical implications.

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