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# High Origin of Profunda Femoris Artery - A Case Report

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## ABSTRACT

Profunda Femoris Artery arises from lateral aspect of femoral artery 3.5cm distal to inguinal ligament. Profunda femoris Artery gives lateral circumflex and medial circumflex femoral arteries from lateral and medial aspect of femoral artery respectively. Following variation was reported in left lower limb of a 62-year male cadaver, during routine dissection of *Rachana Shareera* dissection class. Profunda Femoris Artery arises from lateral aspect of femoral artery 1.5 cm distal to inguinal ligament, runs laterally and down words parallel to femoral artery, the profunda femoris passed beneath rectus femoris, sartorius and vastus medialis successively in its course, later pierced adductor magnus, 5.5 cm above knee joint.

**Key words:** Profunda femoris artery, Femoral artery, Inguinal ligament

## INTRODUCTION

The profunda femoris artery provides the main blood supply to the thigh. It usually arises from the posterolateral aspect of the femoral artery 3.5cm distal to inguinal ligament and descends first laterally, and then posterior to the superficial femoral artery. It gives lateral circumflex and medial circumflex femoral arteries from lateral and medial aspect respectively from femoral artery.<sup>[1]</sup>The femoral artery is second site of choice after radial artery for placement of an arterial line for certain procedures. When easily accessible

veins are collapsed, femoral vein is used for collection of blood. Thus, femoral triangle is clinically important and significant area for accessing vessels.<sup>[2]</sup> Shorter the distance of origin of Profunda Femoris Artery higher is the risk of iatrogenic damage of Profunda femoris Artery. Any variation in Profunda Femoris Artery should be taken in account to prevent unexpected complications.

## CASE REPORT

Following variation was reported in left lower limb of a 62 year male cadaver, during routine dissection of Rachana Shareera dissection class at RGES Ayurvedic Medical College & Hospital and Post Graduate Research Centre, Ron. Profunda Femoris Artery arose from lateral aspect of femoral artery 1.5cm distal to left inguinal ligament, running laterally and down words parallel to femoral artery the profunda femoris passed beneath rectus femoris, Sartorius and vastus medialis successively, finally pierced adductor magnus as forth perforator artery, 5.5 cm above knee joint.

## DISCUSSION

The existence of variations of the lower limb vessels can most often be explained as an abnormal

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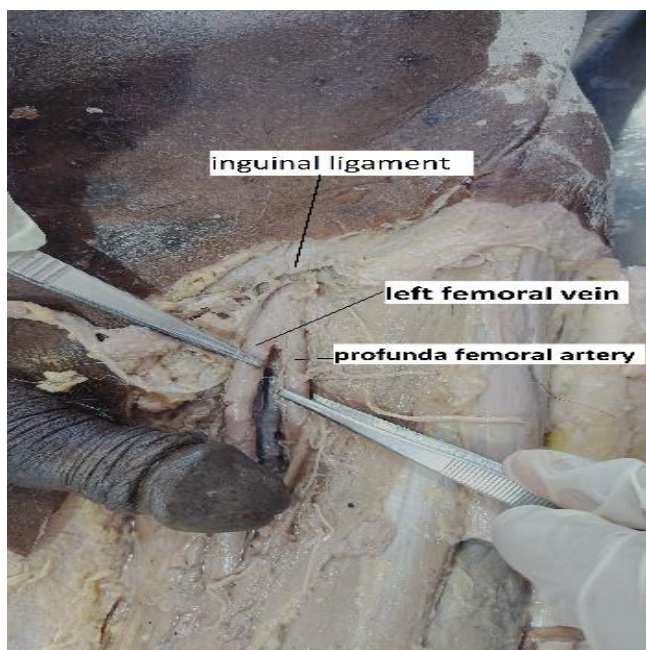
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development of the arterial network of the lower limb in the embryo.<sup>[2,3]</sup> Femoral artery develops from rete femorale in the ventral aspect of the thigh. It communicates with the external iliac artery above through rete pelvicum and sciatic artery below. The persistent sciatic artery grows out from fifth lumbar inter segmental artery in the dorsal part of thigh, when the embryo is about 10 mm long and ends in plantar capillary plexus. As the development proceeds, anastomosis between the axis artery and rete femorale develops. It is generally accepted that increase of blood flow in these capillaries determines the final mature arterial pattern. Thus, the most appropriate channels enlarge while others contract and disappear.<sup>[2,3]</sup> Therefore, we can speculate that one possible reason for the observed variation in this case could be increased blood flow in the rete femorale vessels located at higher level, forming a high origin of Profunda femoris Artery and increased blood flow in the rete femorale vessels. Procedures like arteriography, Doppler imaging, vascular reconstruction of proximal leg necessitates precise anatomy of Profunda femoris Artery along with the femoral artery. Variations of Profunda femoris Artery and their awareness will definitely reduce the risk of damaging them.



**Figure 1: Showing left Profunda Femoris Artery high origin.**



**Figure 2: Showing comparison of left Profunda Femoris Artery origin.**

Origin of Profunda Femoris Artery is from lateral aspect of femoral artery, in 46% it is from posterior aspect, in 30% from postero lateral aspect and in 23% is from lateral aspect.<sup>[4]</sup> The distance between midpoint of inguinal ligament and origin of Profunda Femoris Artery is clinically important.

Judkin technique is undertaken where femoral artery is approached by puncturing the vessel 1 to 3cm below the inguinal ligament.<sup>[5]</sup> In 1 out of 431 cases Profunda femoris Artery was originated above the inguinal ligament, in 1.6% it was originated deep to inguinal ligament and in 3.01% cases it was originated half inch below the inguinal ligament.<sup>[6]</sup> Profunda femoris Artery gives lateral and medial circumflex femoral artery in addition to perforating branches. Lateral circumflex femoral artery gives ascending, transverse and descending branches. Variations are seen in branching pattern of Profunda Femoris Artery unilaterally and or bilaterally<sup>[7]</sup> but in this case Profunda Femoris Artery is given at a higher level than usual. The knowledge of the site of Profunda Femoris Artery origin is very important as it helps in avoiding iatrogenic femoral arteriovenous fistula while performing Femoral Artery puncture, and it enables to identify the correct site of making incision for surgical exposure of the Femoral Artery and Profunda Femoris Artery junction. Shahin *et al.* opined

that, before the catheterization of femoral vessels and operations in the femoral triangle, high resolution ultrasonic imaging can provide anatomic and functional information about the femoral vessels and would be of assistance in planning catheterization. High origin of Profunda femoris Artery can cause problem in procedures like femoral arterial and venous puncture and femoral nerve blocks, because of close relationship of vessels and nerve in femoral triangle.<sup>[5]</sup> Pseudoaneurysms can occur when the puncture site is the Profunda Femoris Artery or Femoral Artery distal to the origin of the Profunda Femoris Artery.

### CONCLUSION

During catheter application, in making flaps with pedicles, in reconstructive surgery and bypass procedures, the direction of the origin of Profunda Femoris Artery is important role.<sup>[7]</sup> Profunda Femoris Artery diameter will decrease if the artery takes its origin more distally from Inguinal ligament. In lower limb revascularization procedures done for non-healing ulcers and/or gangrene, to relieve the claudicating pain, this high origin of the Profunda Femoris Artery knowledge is very useful. It was also explained that during plastic and reconstructive surgery this knowledge is very useful in preventing the necrosis of flap. Detail study of Profunda Femoris Artery and its branching patterns can be thoroughly studied with HD ultrasonic imaging techniques before any related procedures in the femoral triangle to gain successful results.

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