

# ANALYSIS OF THE HEIGHT OF ORIGIN OF PROFUNDA FEMORIS ARTERY FROM THE FEMORAL ARTERY WITH REGARDS TO THE INGUINAL LIGAMENT

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## ABSTRACT

**Background and aims:** To determine the place of height of origin of profunda femoris artery from the femoral artery with regards to the inguinal ligament.

**Materials and methods:** Routine dissection of 6 formalin fixed cadavers (3 males and 3 females) on both lower limbs (totally 12 lower limbs) allotted for the first year students of Kanyakumari Government Medical College, Aasaripallam, Nagercoil.

**Result:** Among them an unusual origin of profunda femoris artery was observed on the left lower limb in a 60 years old female cadaver (8.33%). The profunda femoris artery arose laterally about 0.5 cms from the femoral artery distal to the inguinal ligament. It arose normally on the right lower limb (3.5 cms from the inguinal ligament).

**Conclusion:** A variance in height of origin of profunda femoris artery and its branches will cause changing in the calibers strongly influencing vascularisation quality of belonging flaps. In occlusion of the superficial femoral artery, the profunda femoris artery forms an effective collateral bed between iliofemoral segment and the popliteal artery and its branches. Percutaneous femoral artery cannulation can cause pseudo aneurysms. When this occurs the puncture site is frequently in the profunda femoris artery, where anatomic relationships make hemostasis difficult to achieve. These complications landed up in the study of relations of these arterial complications in the palpable landmarks.

**KEYWORDS:** Profunda femoris artery, Inguinal ligament, Femoral Artery, High Origin.

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## INTRODUCTION

The profunda femoris artery (deep femoral artery) is the largest branch that arises laterally from the femoral artery about 3.5cm distal to the inguinal ligament. At first lateral to the femoral artery, it spirals posterior to this and the femoral vein to reach the medial side of the femur. It passes between pectineus and adductor longus, then between the latter and the adductor brevis, before it descends between adductor

longus and adductor magnus. It pierces adductor magnus and anastomoses with the upper vascular branches of the popliteal artery. This terminal part is sometimes named as the fourth perforating artery. The profunda femoris artery is the main supply to the adductor, extensor and flexor muscles and also anastomoses with the internal and external iliac arteries above and with the popliteal artery below [1,2,3]. As a result the profunda femoris artery has a great surgical

significance. The knowledge of variations in height of the origin of profunda femoris artery and its branches is of great significance for preventing necrosis of tensor fascia latae flap when used in plastic and reconstructive surgery. The present study is intended to review the work done by previous workers and to expose regional variations, if any.

## MATERIALS AND METHODS

Six formalin fixed cadavers were chosen for the present study. There were 3 male and 3 female cadavers with the age range between 30-70 years. Dissection started with skin incision followed by superficial fascia. The superficial inguinal lymph nodes in company with the superficial vessels were identified and the fascia lata was incised thus exposing the femoral triangle. The inguinal canal was identified, so were the adductor longus and sartorius muscles. The femoral sheath was identified and its compartments were dissected thus clearing the femoral artery and its major branches. The relation of the profunda femoris at its origin to the femoral artery was studied. The distance of the site of origin of the profunda femoris artery from the inguinal ligament was measured in millimeters with a scale.

## OBSERVATIONS

Routine dissection was carried out on 6 formalin fixed cadavers (3 male and 3 female) on both the lower limbs. At that time a 60 year old female cadaver showed an unusual origin of profunda femoris artery on the left side. The profunda femoris artery was traced out from the origin to termination and relevant measurements were made using a scale. On the left side, it arose from the lateral aspect of the femoral artery at a distance of 0.5 cms (5 mm) distal to the inguinal ligament (figure 1). On the right side, it arose normally about 4 cms distal to the inguinal ligament. On both sides, the profunda femoris artery coursed inferomedially and exited the femoral triangle in the intervals between the pectineus and adductor longus muscles. The relationship of profunda femoris artery to the structures in the lower part of the femoral artery and its mode of termination did not reveal any variation on both sides. On the left side, the medial and lateral circumflex artery arose from

the profunda femoris artery normally. No other variations were observed in the branching pattern of the profunda femoris artery on both the sides of the cadaver. In all the cadavers the profunda femoris artery arose from the lateral aspect of the femoral artery.

**Fig. 1:** Origin of the Profunda femoris artery from the femoral artery 0.5 cms distal to the inguinal ligament.



IL-Inguinal ligament, FV -Femoral vein,  
FA-Femoral artery, PFA-Profunda femoris artery,  
FN-Femoral Nerve.

## DISCUSSION

Earlier studies on profunda femoris artery carried by the various researchers in their study they found significant variations in the origin, course and relations of it [4-10].

The origin of profunda femoris artery is commonly described as being from the lateral aspect of the femoral artery around 3.5 cms distal to the inguinal ligament [1]. In the present study the profunda femoris artery arose from the lateral aspect of the femoral artery at a distance of 0.5 cms distal to the inguinal ligament.

In a study conducted by Quain [11] on 430 thighs it was found that the origin of the profunda femoris artery was less than 1.3 cms distal to the inguinal ligament in 20 thighs (4.7%). The majority of the profunda femoris artery arose between 2.5 and 5.1 cms from the inguinal ligament.

Another study by Siddharth et al [12] on 100 cadavers revealed that the profunda femoris artery originated at a medial distance of 4.4 cms from the inguinal ligament. At one instance it arose at the level of the inguinal ligament (1%). Dixit DP et al [13] commented that the profunda femoris artery originated from the lateral aspect of femoral artery at a distance of 4.75 cms distal to the inguinal ligament.

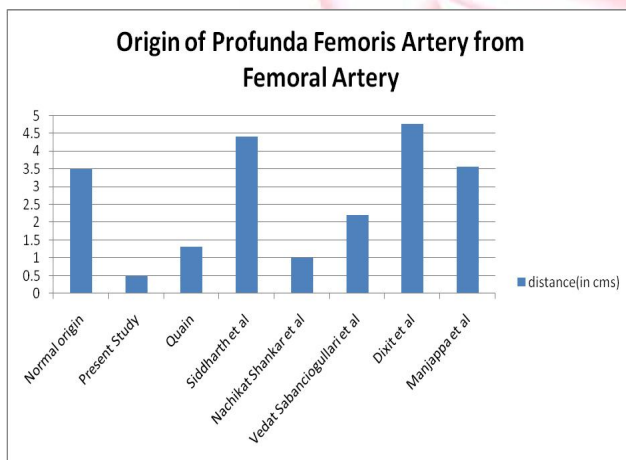
In the study conducted by Vedat Sabanciogullari et al [14] the profunda femoris artery originated at a distance of 2.2 cms from the midpoint of the inguinal ligament in the femoral artery.

Nachikat Shankar et al [15] reported that the profunda femoris artery originated from the lateral side of the femoral artery at a distance of less than 1 cm from the inguinal ligament.

Manjappa et al [16] observed that the profunda femoris artery originated from the lateral side of the femoral artery at a mean distance of 3.56 cms distal to the mid inguinal point.

On a study carried out by Vishal Kumar et al [17] the profunda femoris artery arose from the lateral aspect of femoral artery just lower to the inguinal ligament.

**Graph 1:** Showing Origin of Profunda Femoris Artery form Femoral Artery in various studies.



## CONCLUSION

The relationship of femoral nerve, femoral vein and femoral artery in the upper part of the femoral triangle is important in procedures like femoral arterial and venous puncture and femoral nerve blocks. A high origin of profunda femoris artery could thus pose difficulties in performing those procedures. Surgical exposure of the profunda femoris artery is often necessary

in vascular reconstructive procedures. Further more, plastic surgeons have shown great interest in the muscular branches of the profunda femoris artery when designing procedures that incorporate myocutaneous flaps. The profunda femoris artery is often visualized using angiography, ultrasound and Doppler imaging, digital subtraction and magnetic resonance imaging. Thus anatomical variations of the profunda femoris artery and its branches have significant clinical implications.

**Conflicts of Interests: None**

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