

Unusual variability in the branching pattern of femoral artery and its radiological and surgical significance

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Abstract

The femoral artery is a continuation of external iliac artery below inguinal ligament. The knowledge of variations in the branching pattern of femoral artery is very important for vascular surgeons and intervention radiologists. Variations which involve the femoral, profunda femoris and circumflex femoral arteries are important in vascular reconstructive surgeries, in surgical intervention for embolism, catheterization procedures and in raising myocutaneous graft with pedicle. We report a case of unusual origins of medial and lateral circumflex femoral arteries directly from femoral artery. Accurate knowledge of anatomical variations regarding origin of medial and lateral circumflex femoral arteries is important in present modern era of interventional radiology.

Keywords: Femoral arteries, profunda femoris artery, inguinal ligament, medial circumflex femoral artery, lateral circumflex femoral artery.

1. Introduction

The femoral artery is a continuation of external iliac artery below inguinal ligament. Common femoral artery is the segment of the artery proximal to origin of profunda femoris artery, while segment distal to origin of profunda femoris artery is known as superficial femoral artery[1]. The lateral and medial circumflex femoral arteries are typically the largest branches of profunda femoris artery, although they do not always arise from this vessel, either or both may arise as branches of the femoral artery[2].

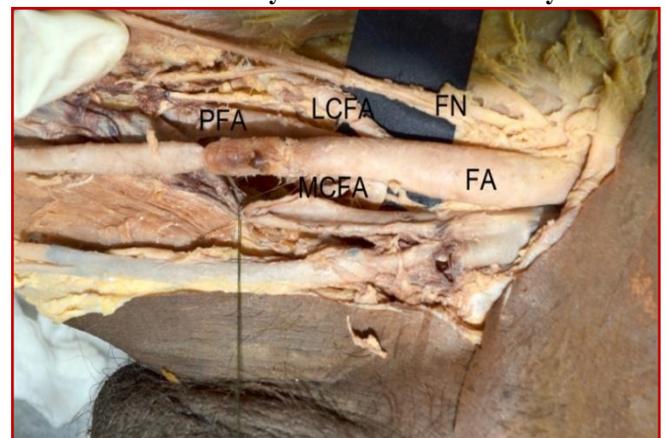
Variation in branching pattern of common femoral artery is important during arterial catheterization for diagnostic and therapeutic radiology, femoral embolectomy and proximal thigh surgeries[3]. Knowledge of variations of lateral and medial circumflex femoral artery is important when undertaking clinical procedures in the femoral region and hip joint replacement[4]. Femoral artery is frequently accessed by surgeons and radiologists; therefore its variation has significant clinical importance.

2. Case report

During routine educational dissection procedure for undergraduate medical students, an unusual branching pattern of femoral artery was observed in a 60 years old male cadaver on right side. The thigh was carefully dissected and femoral artery studied in detail. The medial and lateral circumflex

femoral artery was seen to be arising from common femoral artery, proximal to origin of profunda femoris artery (figure-1). Diameter of medial and lateral circumflex femoral artery was less than diameter of profunda femoris artery.

Figure 1: Origin of medial and lateral circumflex femoral arteries directly from the femoral artery.



FA- femoral artery, PFA- profunda femoris artery, LCFA- lateral circumflex femoral artery, FN- Femoral nerve, MCFA- medial circumflex femoral artery

3. Discussion

Embryologically, primary axial artery is a chief artery of lower limb. During lower limb development, new vessels develop and distribute during 3rd month[5]. The femoral system develops as the sciatic regress. The medial circumflex femoral artery developed independently from the rete femorale. The variability of medial and lateral circumflex femoral artery in origin and its level in relation to profunda femoris artery is due to embryonic development of primitive plexus of femoral trees and primitive axial artery regression either completely or incompletely[6].

Prakash *et al* [7] reported that in 67.2% cases origin of medial circumflex femoral artery was from profunda femoris artery, whereas in 32.8% cases from femoral artery. On the other hand, in 81.25% cases origin of lateral circumflex femoral artery was from profunda femoral artery, whereas in 18.75% cases, from femoral artery.

Baral *et al*[4] observed that lateral and medial circumflex femoral artery were directly arising from femoral artery in 30% & 36% cases. Brijesh *et al* [8] and Dixit *et al* [9] observed lateral circumflex femoral artery was arising from femoral artery in 18.62% & 16.66% extremities respectively, whereas Uzel *et al* [10] observed lateral circumflex femoral artery branched from femoral artery proximal to origin of profunda femoris artery in 19.1% population.

4. Conclusion

Sound anatomical and embryological knowledge of branching pattern of femoral artery is important while performing clinical procedures in femoral region such as catheterization, surgical intervention of embolism, angiography, colour Doppler flow imaging, repair of femoral hernia, musculocutaneous flaps, and vascular reconstructive surgeries. This study will be very helpful to the radiologists & surgeons to understand possible variations before planning different diagnostic and therapeutic interventions on the femoral artery and its branches.

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