ANOMALOUS ORIGIN OF MEDIAL AND LATERAL CIRCUMFLEX FEMORAL ARTERIES - A RARE CASE REPORT
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Abstract: The knowledge about variation in origin of medial and lateral circumflex femoral arteries are very important during surgical procedures and interventional studies. The medial circumflex femoral artery is commonly used for arteriography, Doppler imaging, Digital subtraction angiography. The lateral circumflex femoral artery can be used in coronary artery bypass grafting and as an anterolateral thigh perforator flap in the reconstruction of large defect secondary to gunshot wounds. In the present study both right medial and right lateral circumflex femoral arteries were arising directly from right femoral artery proximal to the profunda femoris artery.

Keyword: Femoral artery, Medial circumflex femoral artery, Lateral circumflex femoral artery, Profunda femoris artery.

INTRODUCTION:
MEDIAL CIRCUMFLEX FEMORAL ARTERY:
Medial circumflex femoral artery most commonly arises from the posterior aspect of the profunda femoris artery. It winds around the medial side of the femur and disappears from the femoral triangle by passing first between the pectineus and ilioptasoas, then between the obturator externus and adductor brevis and finally comes to the interval between quadratus femoris and upper border of adductor magnus. It divides into ascending and transverse branches. The transverse branch takes part in the cruciate anastomosis. The ascending branch ascends on the tendon of obturator externus, anterior to quadratus femoris, to the trochanteric fossa, where it anastomoses with branches of gluteal and lateral circumflex femoral arteries. An acetabular branch at the proximal edge of adductor brevis enters the hip joint under the transverse acetabular ligament. It may occasionally arise from the femoral artery directly. It has important role in supplying the head and neck of the femur and it can be injured in fracture neck of femur.

LATERAL CIRCUMFLEX FEMORAL ARTERY:
Lateral circumflex femoral artery is a lateral branch of profunda femoris artery. It passes laterally between the anterior and posterior divisions of femoral nerve, posterior to sartorius and rectus femoris. It divides into ascending, transverse and descending branches. The descending branch runs down along the anterior border of vastus lateralis accompanying the nerve supplying the muscle, takes part in the anastomosis around the knee joint. It anastomoses with the superior lateral genicular branch of popliteal artery.

The transverse branch passes laterally over the vastus intermedius, pierces the vastus lateralis and winds round the femur just below the greater trochanter, anastomosing on the back of the thigh with transverse branch of medial circumflex femoral artery, inferior gluteal artery and first perforating artery (cruciate anastomosis). The ascending branch passes upwards along the trochanteric line, under cover of tensor fasciae latae to the lateral part of the hip. It anastomoses with the terminal branches of superior gluteal artery and deep circumflex iliac artery and sends a twig to the hip joint between the medial and lateral parts of the iliofemoral ligament. The lateral circumflex femoral artery may arise from the femoral artery. It supplies the greater trochanter of femur and the hip joint. It has been successively used as perforator flap.


CASE REPORT:
During the routine dissection in a 52 year old female cadaver, on right lower limb, the medial circumflex femoral artery was seen arising from femoral artery directly 2.5cm proximal to the profunda femoris artery. The lateral circumflex femoral artery also was seen arising from the femoral artery just proximal to the profunda femoris artery.
from Femoral artery in 18.75 percent and in 81.25 percent it arises from Profunda femoris artery. Hollinshead (1974) reports that the lateral circumflex femoral artery arose from femoral artery in 19.1 percent of cases and 29.12 percent respectively. Siddharth et al (1985) and Dixit et al (2001) found that the lateral circumflex femoral artery is proximal to the origin of medial circumflex femoral artery to be 63 percent and 50 percent respectively. Adachi (1928) and Massoud and Fletcher (1997) also reported the percentage of origin of medial circumflex femoral artery from Profunda femoris artery to be 63.2 percent and 81 percent respectively. In cadaveric studies, Siddharth et al (1985) and Dixit et al (2001) found that the medial circumflex femoral artery originated from femoral artery in 14 percent and 18 percent respectively. Adachi (1928) and Massoud and Fletcher (1997) also reported the percentage of origin of medial circumflex femoral artery from Profunda femoris artery to be 63.2 percent and 81 percent respectively. In cadaveric studies, Siddharth et al (1985) and Dixit et al (2001) found that the medial circumflex femoral artery originated from femoral artery in 26 percent and 29.12 percent respectively. Siddharth et al (1985) and Dixit et al (2001) also reported the percentage of origin of the medial circumflex femoral artery from Profunda femoris artery to be 63 percent and 50 percent respectively.

Incidence of origin of medial circumflex femoral artery:
In angiographic studies, Adachi (1928) and Massoud and Fletcher (1997) reported that the medial circumflex femoral artery originated from femoral artery in 14 percent and 18 percent respectively. Adachi (1928) and Massoud and Fletcher (1997) also reported the percentage of origin of medial circumflex femoral artery from Profunda femoris artery to be 63.2 percent and 81 percent respectively. In cadaveric studies, Siddharth et al (1985) and Dixit et al (2001) found that the medial circumflex femoral artery originated from femoral artery in 26 percent and 29.12 percent respectively. Siddharth et al (1985) and Dixit et al (2001) also reported the percentage of origin of the medial circumflex femoral artery from Profunda femoris artery to be 63 percent and 50 percent respectively.

Incidence of origin of lateral circumflex femoral artery:
M Uzel et al (2008) in a cadaveric study found that the lateral circumflex femoral artery arose from femoral artery in 19.1 percent of cases and 77.3 percent from Profunda femoris artery. Hollinshead (1974) reports that the lateral circumflex femoral artery arises from the femoral artery in 15 percent of cases proximal to the profunda femoris artery and in 85 percent it arises from Profunda femoris artery directly. Ashwini S Shetty (2012) found that the lateral circumflex femoral artery arose from Femoral artery in 18.75 percent and in 81.25 percent it arose from profunda femoris artery. Sinkeet S R (2012) found that the lateral circumflex femoral artery arose from the femoral artery in 2.4 percent and in 65.5 percent it arose from Profunda femoris artery.

Vasquez et al classified the origin of medial and lateral circumflex femoral arteries into 3 patterns: Type 1: both medial and lateral circumflex femoral arteries arise from profunda femoris artery (78.8%); Type 1a: origin of medial circumflex femoral artery is proximal to the origin of lateral circumflex femoral artery (53.2%); Type 1b: origin of lateral circumflex femoral artery is proximal to the origin of medial circumflex femoral artery (23.4%); Type 1c: both arise from a common trunk (23.4%).

Type 2a: medial circumflex femoral artery arises from femoral artery (77.8%)
Type 2b: lateral circumflex femoral artery arises from femoral artery (22.2%)
Type 3: both medial and lateral circumflex femoral arteries arise from femoral artery (0.5%) In my report, it coincides with type 3 pattern of Vasquez’s classification. Hisayo Nasu and Shogi Chiba have also reported the origin of medial and lateral circumflex femoral arteries from a common trunk. The anomalous origin of both medial and lateral circumflex femoral arteries directly from femoral artery may be due to aberrant vessels that connect with principal vessels or due to presence of unusual compound arterial segments.

CONCLUSION:
The high origin of medial circumflex femoral artery is more prone for injury during cardiac catheterization leading to catastrophic haemorrhage in this region. The variation in origin of lateral circumflex femoral artery is important and crucial for orthopaedic procedures such as hip replacement surgeries and for various flap reconstructive procedures. So the variation in their origin and branches need to be taken into consideration in all surgical and interventional procedures.

REFERENCES:

DISCUSSION:
According to Gray’s anatomy (2012), the medial circumflex femoral artery usually originates from profunda femoris artery, but often originates from the femoral artery. The lateral circumflex femoral artery is a lateral branch from given off near the root of the profunda femoris artery, but it may also arise from the femoral artery.

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