

Original Article

MORPHOLOGICAL STUDY OF MEDIAL CIRCUMFLEX FEMORAL ARTERY IN HUMAN CADAVERS

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ABSTRACT

Background: Medial circumflex femoral artery is an important branch of Profunda femoris artery. It is an important artery in supplying blood to the head and neck of the femur, the adductor muscles and form anastomosis around head of femur. So study of variation of medial circumflex femoral artery great value for surgeon and orthopaedic surgeries.

Materials and Methods: The present study includes 102 lower limbs of adult formalin fixed human cadavers used for the routine dissection procedure for under graduate and post graduate students in the department of Anatomy, M.R. Medical College, KBN Medical college and H K E Homeopathic College, Gulbarga (India) during 2011-2014. The study was done by dissection method as per Cunningham's manual of practical Anatomy.

Result: In present study, we found that 25 extremities (25.49%) medial circumflex femoral artery was originated directly from femoral artery. In 10 extremities (9.80%) a common trunk was observed from medial circumflex femoral with femoral artery. Normal study was observed in 66 extremities (64.70%).

Conclusion: In present study and other past studies we conclude that knowledge of variation in this artery is very important to preventing injury to vessels during surgical procedures around hip joint and also has important value in plastic surgery operations as the vascular pedicle of grafts such as the transverse upper gracilis (TUG) flap, medial thigh flap and medial circumflex femoral (gracilis) perforator free flap. During case of selective arteriography in ischaemic necrosis of the femoral head to know the arterial supply of the femoral head it is used.

KEY WORDS: Medial circumflex femoral artery, Profunda femoris artery, Femoral artery.

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Access this Article online

Quick Response code



DOI: 10.16965/ijar.2014.514

Web site: International Journal of Anatomy and Research

ISSN 2321-4287

www.ijmhr.org/ijar.htm

Received: 11 Oct 2014

Peer Review: 11 Oct 2014 Published (O):31 Oct 2014

Accepted: 21 Oct 2014 Published (P):31 Dec 2014

INTRODUCTION

Medial circumflex femoral artery is most important branch of Profunda femoris artery. It arises from the postero medial aspect of the Profunda femoris artery in the femoral triangle, and gives two branches ascending and transverse then it forms cruciate and trochanteric anastomosis with lateral circumflex femoral artery [1, 2].

It is an important artery in supplying blood to the head and neck of the femur, to the adductor compartment of thigh and region surrounding hip joint [3, 4]. Knowledge of the anatomy of medial circumflex femoral artery is essential when performing both trochanteric and intertrochanteric surgeries and is also useful to prevent iatrogenic vascular necrosis of the head of

femur in reconstructive surgery of the hip and fixation of acetabular fractures through the posterior approach [4]. It has important value in plastic surgery operations as the vascular pedicle of grafts such as the transverse upper gracilis (TUG) flap, medial thigh flap and medial circumflex femoral (gracilis) perforator free flap[5, 6, 7].

MATERIALS AND METHODS

The materials used for this study consist of 102 limbs of formalin fixed Adult human cadavers used for the routine dissection procedure for under graduate and post graduate students in the department of Anatomy, M.R. Medical College, H K E Homeopathic College and KBN Medical college, Gulbarga during 2011-2014

Around 102 femoral triangles were dissected & their history was periodically recorded in data sheet. The routine dissection technique was employed from Cunningham's manual of practical Anatomy, first skin & superficial fascia reflected from the front of thigh after word splitting of femoral sheath on both side of femoral vein with exposure of femoral canal & femoral artery, lastly dissect profunda femoris origin from femoral artery and traced it downward medial to find medial circum flex femoral artery. Noted in data sheet according to originated from profunda femoris artery and the femoral artery and distance of origin of from the midpoint of inguinal ligament was measured in millimeters with a scale & Vernier caliper and recorded in data sheet.

OBSERVATIONS AND RESULTS

In our study, we observed various sites of origin and distance of MCF artery, the present study used 102 limbs where 72 limbs were from male cadavers and 30 limbs were from female cadavers.

During our study we found variation in origin of medial circumflex femoral artery, it origin from direct from femoral artery superior and inferior to profunda femoris artery.

We found: 66 (64.70%) limbs the origin of MCF from PFA (43 male limbs and in 23 female limbs).which is most common site of origin.

Medial circumflex femoral artery origin from FA superior to origin of PFA found in 18 limbs

(17.64%), in which (16 male limbs). This type of variation was present in female only in 2 limbs. In 7 limbs unilateral origin of MCF was observed from femoral artery inferior to PFA (4 limbs of male cadavers and 3 limbs of female cadavers) were included.

Rare but most dangerous variation found in 7 limbs, MCF originated either from PFA or from FA that coursed superficial to the femoral vein. Out of 102 limbs, there was only a single case where MCF was absent.

These all observations about the various sites of origin of MCF along with sex ratio were presented in form of percentage frequency that were recorded in tabulated form which is given below in table-1.

Figure -5 showing that on both sides, the normal distance of origin of MCF was between the ranges of 0-10 mm. (means MCF mostly arises near the origin of PFA). Out of 47 limbs (31 limbs were from male cadaver and 16 limbs were from female cadavers). Thus, it was the common range recorded in both sexes.

Table 1: Site of origin of medial circumflex femoral artery (102 limbs).

Site of origin	Right side no of limbs	Left side no of limbs	Bilateral no of limbs	Percentage frequency
Medial aspect	7 M,4F = 11	12 M,1F=13	24 M,18 F = 42	42.1% M,22.5% = 64.7%
Common stem with PFA	4 M,1F = 5	4 M,1F = 5	0 M,0 F = 0	7.8% M,1.9% F=9.8%
Superior to PFA	8 M,0F = 8	4 M,2 F = 6	4 M,0 F = 4	15.7% M,2.9% F=18.6%
Inferior to PFA	3 M,1F = 4	1 M,2 F = 3	0 M,0 F = 0	3.9% M,2.9% F=6.8%
MCF may be absent	0 M,0F = 0	1 M,0 F = 1	0 M,0 F = 0	0.98% M,0.00% F=0.98%
Total	28	28	46	100%

Fig. 1: Origin of MCF from PFA on Medial aspect.

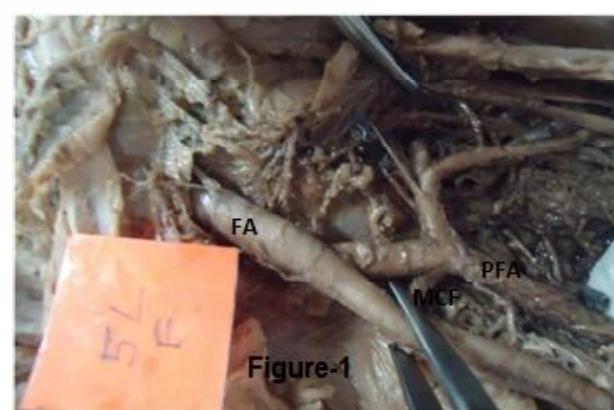


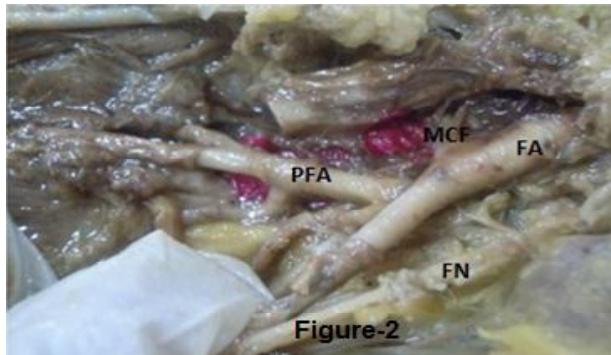
Fig. 2: Origin of MCF from FA superior to origin of PFA.

Figure-2

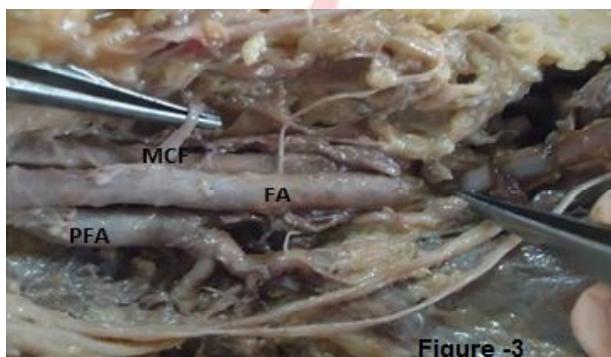
Fig. 3: Origin of MCF from FA Inferior to origin of PFA.

Figure -3

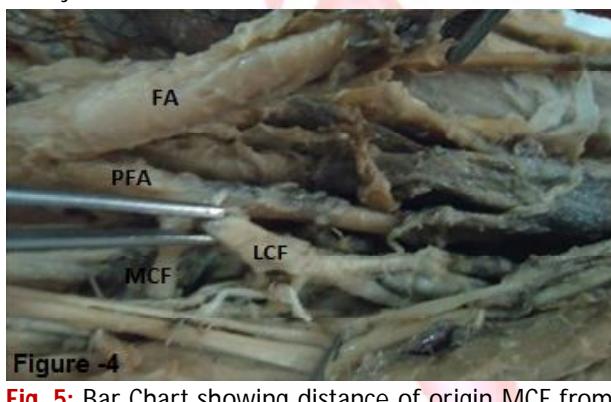
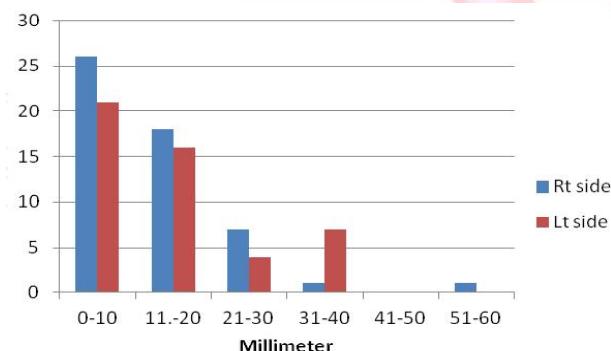
Fig. 4: Origin of MCF from PFA common stem with LCF artery.

Figure -4

Fig. 5: Bar Chart showing distance of origin MCF from PFA in mm.

DISCUSSION AND CONCLUSION

Medial circumflex femoral artery is valuable artery supply upper part of femur, relation of MCF artery with femur and hip bone, it is very important to have knowledge of variation about MCF artery.

The medial circumflex femoral artery on an average was arising in 64.70% of cases from profunda femoris artery and in 25.49 % of cases from femoral artery. In 9.80% of cases a common trunk for medial circumflex femoral were observed.

The result of present study is close to Dixit D P, which was 62.5% from profunda femoris artery and 20.63% directly from femoral artery [8].

According to Tanyeli E et al, MCF artery arises from PFA in 79% cases and from the FA in 21% cases. [9] In other study by Vaibhav A et al, found MCF artery origin from PFA in 75 limbs and from FA 26 limbs out of 120 limbs. [10]

Mamatha et al found that MCF artery arises from the PFA in 87.5 % [11]. Compare with other studies Tanyeli et al found in 79% cases[9], Dixit DP et al in 62.5%[8], Clark and Colborn21 in 53% [12]. According shiny Vinila et al, MCF artery arise from 60% from PFA and in 18.4% from FA [13].

Daksha D et al study, medial circumflex femoral artery arises from profunda femoral artery on 140 limbs on medial aspect out of 228 limbs. In 53 limbs MCF artery arise from FA [14].

In the cases in which medial circumflex femoral artery originating directly from femoral artery distance that was smaller than in the cases in which it was originating from profunda femoris artery.

Comparison of the variations related to the origin of medial femoral circumflex femoral arteries in different studies show in Table – 2.

Table 2: Comparison of the variations related to the origin of medial femoral circumflex femoral arteries in different studies.

Sl. No.	Authors	Specimens study	MCF from PFA (%)	MCF from FA (including common stem) (%)
1	Tanyeli E et al	cadavers	79	21
2	Siddharth. P	cadavers	63	37
3	Dixit. D.P	cadavers	62.5	37.5
4	Gautier E	cadavers	83.3	16.7
5	Clark SM and Colborn GL	cadavers	53	47
6	MB Samarakkrama	cadavers	62	31
7	Present study	cadavers	64.7	35.29

Above all discussion we conclude that MCF artery arise from FA. This variation is become dangerous during catheterization for cardiac surgeries.

Due to its high position it can be damaged when the femoral artery is punctured for various cardiac interventional procedures, or it may be damaged while collecting blood in infants from the femoral vein. Knowledge of variation of artery is useful during exposure of the saphenous vein for ligation at its junction with the femoral vein. Damage to medial circumflex femoral artery leads to avascular necrosis of head of the femur as it is the chief artery for it. If lacking knowledge of variation of artery may cause severe haemorrhage consequence.

Abbreviations:

MCF- medial circumflex femoral,
PFA- profunda femoris artery,
FA- femoral artery,
LCF – lateral circumflex femoral.

Conflicts of Interests: None

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How to cite this article:

Brijesh R. Aghera, Priyanka Karunakar, Sujatha. K, Fathima T.
MORPHOLOGICAL STUDY OF MEDIAL CIRCUMFLEX FEMORAL ARTERY IN HUMAN CADAVERS. *Int J Anat Res* 2014;2(4):636-639.
DOI: 10.16965/ijar.2014.514