International Journal of Anatomy and Research,
Int J Anat Res 2017, Vol 5(2.3):3934-37. ISSN 2321-4287
DOI: https://dx.doi.org/10.16965/ijar.2017.223

Original Research Article

A STUDY ON THE ANATOMICAL VARIATIONS IN THE MEDIAL CIRCUMFLEX FEMORAL ARTERY

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ABSTRACT

Background: The medial circumflex femoral artery(MCFA) is a medial branch of the profunda femoris artery(PFA), but in some cases it originates from the femoral artery(FA).It is a vital artery supplying the head and neck of femur.It is very important to avoid its injury in hip surgeries to prevent necrosis of the femoral head.

Materials and Methods: Fifty adult lower limb specimens were obtained from the embalmed cadavers at the department of Anatomy, Stanley Medical College, Chennai. The femoral triangles were dissected ,the femoral artery and its main branch, the profunda femoris artery were exposed completely. The lateral and medial circumflex branches of the PFA were dissected and identified.The origin of the MCFA from the profunda femoris and variations present in its origin were studied and photographed.

Results: The MCFA arose from the PFA in 32 specimens(64%) and from the FA in 18 cases(36%). In 2 cases(4%) the MCFA after arising from the PFA immediately divided in to three branches in the femoral triangle itself.Out of 18 cases in which the MCFA originated from the FA,in 2 specimens(4%) the MCFA and PFA originated as a common trunk(CT) from the femoral artery.In 4 cases (8%) the MCFA arose from the FA superior to the origin of deep external pudendal artery (DEPA).In 2 specimens(4%) the MCFA after originating from the femoral artery divided in to two branches in the femoral triangle itself.

Conclusion: The knowledge of MCFA origin and branching pattern is helpful in preventing iatrogenic injury to these vessels during surgical procedures in the hip joint and femoral triangle.

KEY WORDS: Profunda Femoris Artery, Femoral Artery,Medial Circumflex Femoral Artery,Deep External Pudendal Artery.

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Access this Article online

Quick Response code

DOI: 10.16965/ijar.2017.223

Web site: International Journal of Anatomy and Research
ISSN 2321-4287
www.ijmhr.org/ijar.htm

Received: 17 Apr 2017
Peer Review: 17 Apr 2017
Revised: None

Accepted: 23 May 2017
Published (O): 30 Jun 2017
Published (P): 30 Jun 2017

INTRODUCTION

The medial circumflex femoral artery (MCFA)is a branch of the profunda femoris artery.It arises from the profunda femoris artery(PFA) near its origin, goes posteriorly out of the femoral triangle, and then proceeds to the upper border of the adductor magnus, where it ends by dividing into transverse and ascending branches [1].

Medial circumflex femoral artery is a vital artery supplying the head and neck of femur, adductor thigh muscles and adipose tissue in the acetabular fossa [2,3]. It forms the cruciate anastomosis in the intertrochanteric fossa through which the circulation of the lower limb is accomplished in case of an occlusion of the femoral artery [4,5]. Precise knowledge of this artery is needed when performing trochantericand intertrochanteric osteotomies and it is

also helpful to avoid iatrogenic vascular necrosis of the head of femur in reconstructive surgeries of the hip joint [6].

The MCFA is used in selective arteriography in case of idiopathic ichaemic necrosis of the femoral head in order to determine the arterial blood supply of the femoral head [7]. MCFA is used in flap plastic surgeries as a vascular pedicle content such as transverse upper gracilis flap and medial circumflex femoral perforator free flap [8,9].

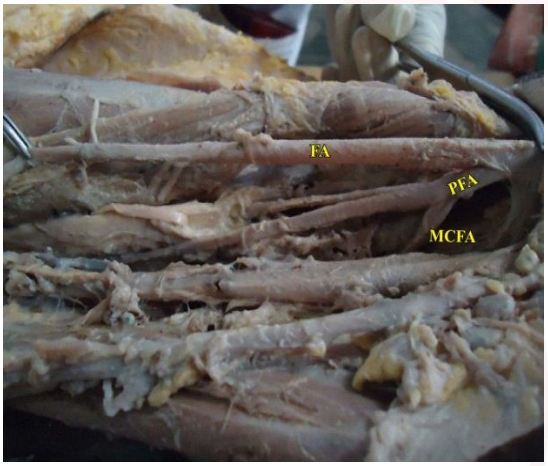
MATERIALS AND METHODS

Fifty adult lower limb specimens were obtained from the embalmed cadavers at the department of Anatomy, Stanley Medical College, Chennai, Tamilnadu, India.

The femoral triangles were dissected ,the femoral artery and its main branch in the femoral triangle, the profunda femoris artery were exposed completely.The lateral and medial circumflex branches of the PFA were dissected and identified. The origin of the MCFA from the profundafemoris and variations present in its origin were studied and photographed.

RESULTS

Fig. 1: Origin of medial circumflex femoral artery from the profunda femoris artery.



The MCFA arose from the PFA in 32 specimens (64%) and from the FA in 18 cases (36%). In 2 cases (4%) the MCFA after arising from the PFA immediately divided in to three branches in the femoral triangle itself.

Out of 18 cases in which the MCFA originated from the FA, in 2 specimens (4%) the MCFA and PFA originated as a common trunk(CT) from the femoral artery.

In 4 cases (8%) the MCFA arose from the FA superior to the origin of deep external pudendal artery (DEPA).In 2 specimens(4%) the MCFA after originating from the femoral artery divided in to two branches in the femoral triangle itself.

Fig. 2: Medial circumflex femoral artery arising directly from femoral artery.

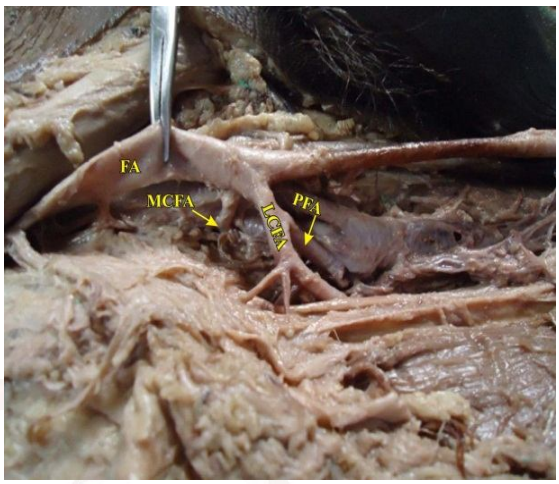


Fig. 3: Medial circumflex femoral artery arising directly from femoral artery.

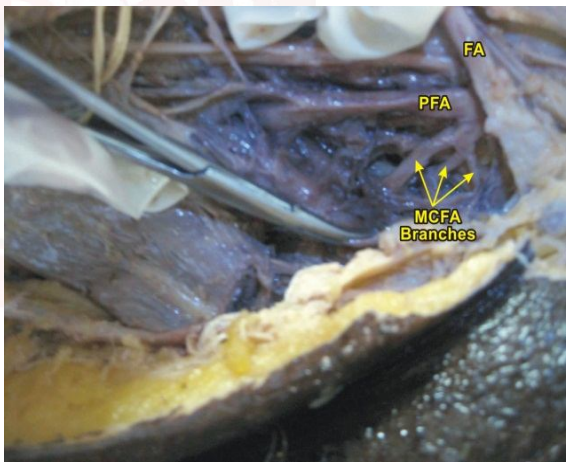


Fig. 4: Medial circumflex femoral artery arising as a common stem with profunda femoris artery.

Fig. 5: Medial circumflex femoral artery from the profunda femoris dividing into three branches in the femoral triangle.

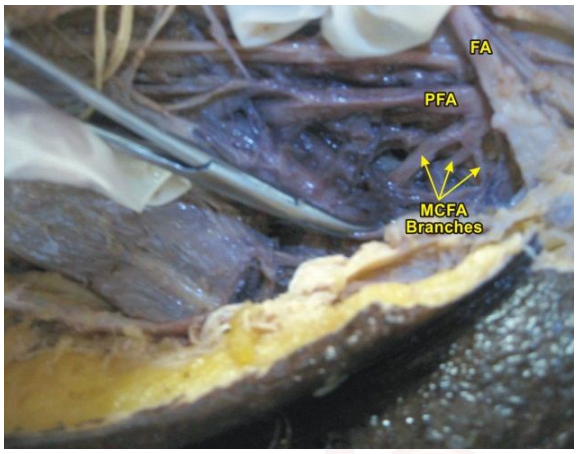
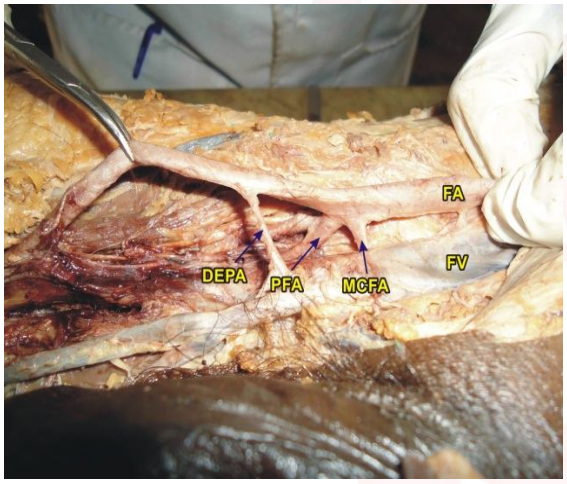


Fig. 7: Origin of medial circumflex femoral artery from the femoral artery above deep external pudendal artery.



DISCUSSION

The MCFA arose from PFA in 64% and from the femoral artery in 36%.In 2 cases(4%) the MCFA after arising from the PFA immediately divided in to three branches in the femoral triangle itself.The table below gives a comparison of the present study with other studies in the literature on the site of origin of MCFA.

Table 1: Site of origin of MCFA.

Origin of MCFA	From PFA	From FA (including common stem)
Siddharth P et al (1985) [10]	63%	37%
MB Samarawickrama (2009) [11]	62%	38%
Prakash et al (2010) [12]	67.20%	32.80%
Daksha Dixit (2011) [13]	56.10%	43.90%
Present study	64%	36%

Common trunk origin of MCFA with PFA from the femoral artery was 4% in the present study,but in Samarawickrama study it was 8% , inTanyeli et al study(2006) it was 2% and in Daksha et al study it was 14%.

Fig. 6: Origin of medial circumflex femoral artery from the femoral artery above deep external pudendal artery.

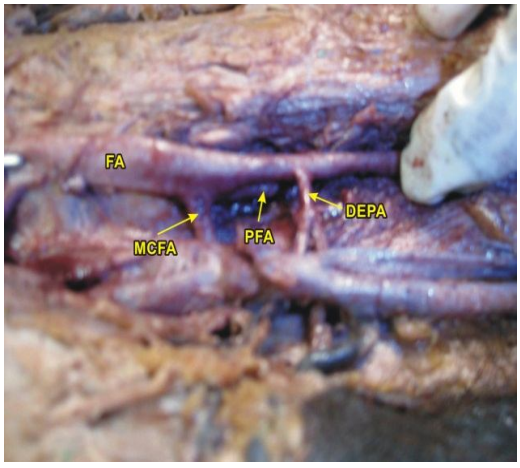


Fig. 8: Medial circumflex femoral artery arising from the femoral artery dividing into two branches in the femoral triangle.

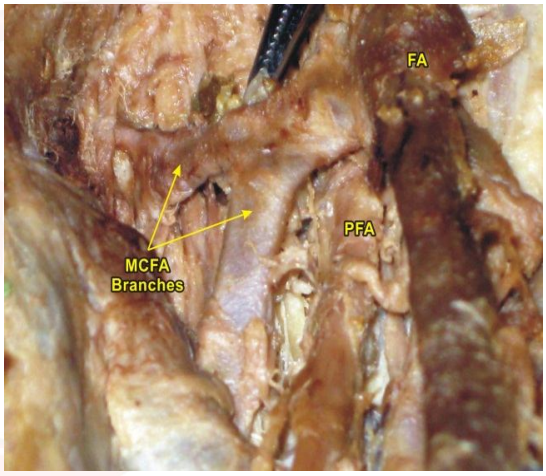


Table 2: Origin of MCFA from FA- CT with PFA.

Studies	CT of MCFA and PFA
Tanyeli et al (2006) [14]	2%
Samarawickrama et al (2009) [11]	8%
Daksha et al (2011) [13]	14%
Present study	4%

A study by Shiny Vimala BH et al [15] reported a common trunk origin of DEPA and MCFA to be 17.5%,but in our study the medial circumflex femoral artery arose from the femoral artery superior to the deep external pudendal artery in 8%.The MCFA after originating from the femoral artery divided in to two branches in the femoral triangle in 4%.

CONCLUSION

There is a high risk of damage to the MCFA after trauma and surgeries such as total hip

arthroplasty. This study will be helpful to surgeons and orthopaedicians to avoid its injury during hip surgeries and thereby prevent necrosis of the femoral head.

ABBREVIATION

FA - Femoral Artery
FV - Femoral Vein
PFA - Profunda Femoris Artery
MCFA - Medial Circumflex Femoral Artery
DEPA - Deep External Pudendal Artery

Conflicts of Interests: None

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How to cite this article:
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