

STUDY OF LATERAL CIRCUMFLEX FEMORAL ARTERY

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ABSTRACT

Background: Lateral circumflex femoral artery is a one of most important branch of Profunda femoris artery. It is an artery supplying blood to the head and neck of the femur and form anastomosis around upper part of femur. In many cases artery is useful for bypass surgery like aortopopliteal bypass, anterolateral thigh flap, coronary bypass surgery. Hence the knowledge of variations of artery and its branches are useful during operations such as total hip arthroplasty and other surgery to prevent haemorrhage and other complications.

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 during 2011-2014. The study was done by dissection method as per Cunningham's manual of practical Anatomy.

Results: The origin of lateral circumflex femoral artery from profunda femoral artery on lateral aspect was observed in 82 limbs (80.38%). Origin of lateral circumflex femoral artery from femoral artery having common stem with Profunda femoris artery were observed in 11 limbs (10.78%). Origin of lateral circumflex femoral artery from femoral artery were observed in 7 limbs (7.8%).

Conclusion: Concluding and comparison of our study and past studies, all knowledge of the normal anatomy and variations of the site of origin and course of the LCF artery is not only surgical importance during vascular diagnostic intervention and surgeries but also helps in reducing the chances of intra-operative secondary haemorrhage and post-operative complications.

KEYWORDS: Lateral circumflex femoral artery, Profunda femoris artery, Femoral artery.

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INTRODUCTION

Lateral circumflex femoral artery is a branch of Profunda femoris artery. It arises from lateral aspect of the Profunda femoris artery in the femoral triangle. It divides into its ascending, transverse and descending branches. It is an important artery in supplying blood to the head and neck of the femur and to fatty tissue in the acetabular fossa [1]. Knowledge of variations

useful for avoid iatrogenic vascular necrosis of the head of femur during reconstructive surgery of the hip and operate the acetabular fractures through the posterolateral approach [2]. LCF artery and its branches are used in an anterolateral thigh flap [3], in some cases used for aortopopliteal bypass [4, 5], coronary artery bypass grafting [6]. The ascending and descending branch of the artery can be used as a supply

for vascularised iliac transplantation and act as collateral [7, 8]. Some surgeons are use descending branch of lateral circumflex femoral artery as alternative artery in extra – intra cranial bypass surgery. In past variations of lateral circumflex femoral artery was noted by many authors, compare and conclude with them we can prevent complication and haemorrhage.

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, KBN Medical college and H K E Homeopathic College, Gulbarga, India during 2011-2014. Around 102 femoral triangles were dissected, origin and course of artery was periodically recorded in data sheet. The routine dissection technique was employed from Cunningham's manual of practical Anatomy.

RESULTS

In present study total 102 limbs were dissected, 72 limbs of male cadavers and 30 limbs female cadavers for the observation of the site of origin of LCF artery.

Out of which in 82 limbs were observed where the LCF artery originated from Profunda femoris artery on lateral aspect. (58 limbs were from male cadavers and 24 limbs were from female cadavers).

In 11 limbs, the origin of LCF artery in the form of common stem along with PFA from FA were observed (7 limbs were from male cadavers and 4 limbs were from female cadavers).

The origin of LCF artery from femoral artery superior to PFA was observed only in 3 limbs. (2 limbs were from male cadavers and one limb was from female cadavers)

In 5 limbs of male cadavers, the origin of LCF artery from FA was found inferior to origin of PFA. But not single female limbs indicated this type of variation, because this type of variation itself was very rare.

The most common distance of origin of LCF artery from Profunda femoral artery according our observation is the range between 20-30 mm. This is also common range in both sexes.

And this is the normal distance of origin of PFA and remaining course of LCF artery is normal which divided into ascending, transverse and descending branches form trochanteric and cruciate anastomosis around head and neck of femur.

All these observations about the origin of LCF artery along with sex ratio in form of percentage frequency were tabulated. (Table-1)

Fig. 1: Origin of LCF artery from PFA on lateral aspect.

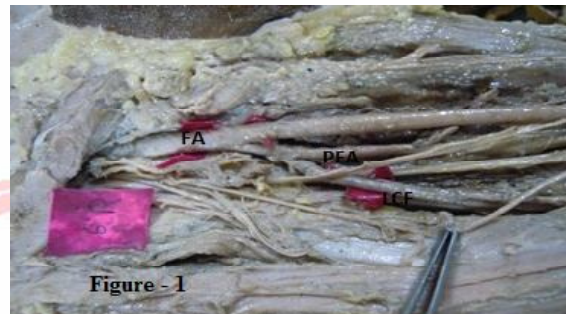


Fig. 2: Origin of LCF artery from FA common stem with PFA.

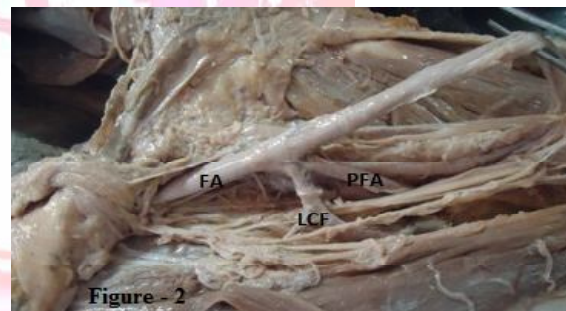


Fig. 3: Origin of LCF artery from FA superior to origin of PFA.

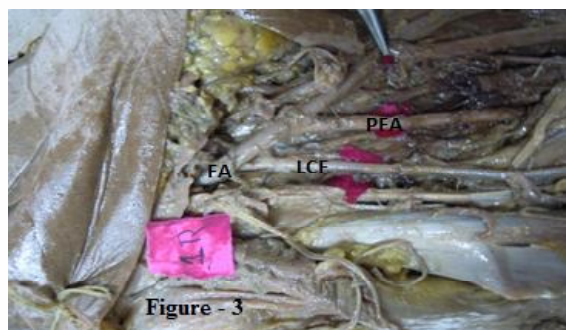


Fig. 4: Origin of LCF artery from FA Inferior to origin of PFA.

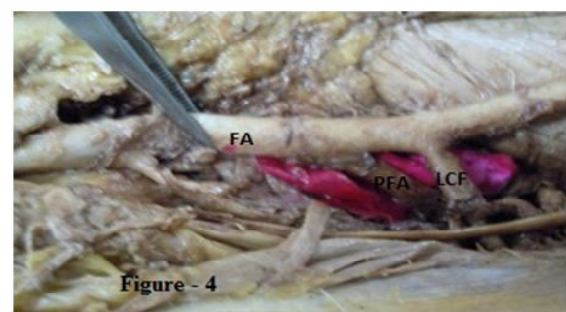
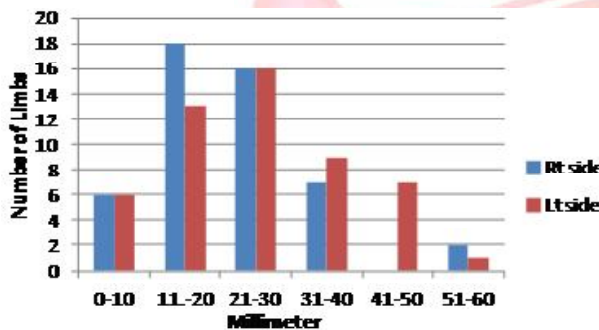


Table 1: Site of origin of lateral circumflex femoral artery (102 limbs).

Site	No. of limbs only on right side	No. of limbs only on left side	No. of limbs on bilateral	Percentages
Origin from PFA on lateral aspect	7 M + 1 F = 8	5 M + 3 F = 8	46 M + 20 F = 66	56.86% M 23.53% F 80.39
Origin from FA common stem with PFA	3 M + 2 F = 5	2 M + 0 F = 2	2 M + 2 F = 4	6.86% M 3.92% F 10.78
Origin from FA superior to PFA	1 M + 1 F = 2	1 M + 0 F = 1	0 M + 0 F = 0	1.96% M 0.98% F 2.94
Origin from FA inferior to PFA	1 M + 0 F = 1	4 M + 0 F = 4	0 M + 0 F = 0	4.90% M 0.00% F 0.049
LCF artery may be absent	0 M + 0 F = 0	0 M + 1 F = 1	0 M + 0 F = 0	0.00% M 0.97% F 0.97
Total	16	16	70	100%

Fig. 5: (Bar Chart) Showing distance origin of LCF artery from PFA in mm.



DISCUSSION

Lateral circumflex femoral artery and its branches is a valuable artery supplying blood to the head and neck of the femur, the acetabular fossa and knee joint. Because of its close relationship with this area there is a high risk of severing the artery after trauma or during operations such as total hip arthroplasty other surgeries.

The commonest site of origin of lateral circumflex femoral artery bilaterally was from the lateral aspect of Profunda femoris artery i.e. (80.39%).

In most of our cases the distance of origin of lateral circumflex femoral artery from the origin of Profunda femoris artery was between 21-30 mm.

Uzel M et al studied 110 inguinal regions and found lateral circumflex femoral artery arising from Profunda femoris artery in 85 cases (77.3%) and from femoral artery including common stem in 25 cases (22.7%) [10].

In study of Prakash, the lateral femoral circumflex artery in 52 out of 64 (81.25%)

Table 2: Comparison of present study with other studies.

Sl. No.	Authors	Specimens study	LCF of from PFA (%)	LCF from FA (common stem) (%)
1	Uzel Met al.	cadavers	77.3	22.7
2	Fukuda H et al.	Angiograph	78.6	21.4
3	Dixit DP et al.	cadavers	83.34	16.66
4	Choi SW et al.	cadavers	86.8	13.2
5	Tansatit T et al.	cadavers	56.67	43.33
6	Present study	cadavers	80.39	18.62

extremities originated from the profunda femoris artery; whereas in 12 out of 64 (18.75%) extremities it originated from the femoral artery [11].

Dixit D et al observed the origin of lateral circumflex femoral artery on the right side was from profunda femoris artery in 72.8% (83 cases), from femoral artery as a common stem with profunda femoris artery in 17.5% (20 cases), from femoral artery superior to profunda femoris artery in 5.2% (6 cases), from femoral artery inferior to profunda femoris artery in 2.6% (3 cases)[12].

Bergman RA et al in 1996 observed 200 limbs out of which in 123 cases both the lateral and medial circumflex femoral arteries originated from Profunda femoris artery. Out of the remaining cases lateral circumflex femoral artery was arising from femoral artery in 29 cases [13].

Comparison of present study with other studies given in Table - 2.

CONCLUSION

According to our study and other studies, variation in branching pattern of the lateral circumflex femoral artery is common. Vasculature development in the lower limb precedes the morphological and molecular changes that occur in the limb mesenchyme; hence vascular variations are more of a rule than an exception. Anomalous patterns of vascular system may be due to divergence in the mode and proximo-distal level of branching and presence of unusual compound arterial segments; aberrant vessels that connect with the principal vessels [1]. Concluding and comparison of all knowledge of the normal anatomy and variations of the site of origin and course of the LCF artery is not only surgical importance during vascular diagnostic intervention and surgeries but also helps in

reducing the chances of intra-operative secondary haemorrhage and post-operative complications.

Abbreviations:

LCF- Lateral Circumflex Femoral,

PFA – Profunda Femoris Artery,

FA – Femoral Artery

Conflicts of Interests: None

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