VOLUME - 10, ISSUE - 09, SEPTEMBER - 2021 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Anatomy

A VARIATION IN ORIGIN OF BRANCHES OF PROFUNDA FEMORIS ARTERY IN RELATION WITH FEMORAL ARTERY: A CASE REPORT

Dr. Sonia Meend*	M.D. Scholar, Dept of Rachana Sharir(Anatomy), National Institute of Ayurveda, Jaipur. *Corresponding Author
Dr. Priyanka Devatwal	M.D. Scholar, Dept. of Rachana Sharir (Anatomy), National Institute of Ayurveda, Jaipur.
Dr. Priyanka Verma	M.D. Scholar, Dept. of Rachana Sharir (Anatomy), National Institute of Ayurveda, Jaipur.
Dr. Bhumica Bodh	M.D. Scholar, Dept. of Rachana Sharir (Anatomy), National Institute of Ayurveda, Jaipur.

ABSTRACT

Introduction – Profunda femoris is the main course of supply to the muscles of thigh area. It is the biggest part of femoral supply route in the thigh region. It gives out branches named medial circumflex femoral and lateral circumflex femoral and four perforating branches and proceeds as the fourth perforating branch in the mid of thigh. A variation regarding the branching pattern of profunda femoris artery was observed with an origin of medial and lateral circumflex arteries is been seen in a formalin embalmed 55 years of age female cadaver during typical dissection procedure in the dissection hall.

Methods - The study was undertaken on lower limb of a fully embalmed 55years old female cadaver in the department of anatomy, used for routine dissection for teaching undergraduate and post graduate medical students.

Result - In this female cadaver on left side of lower limb, there was an uncommon origin of lateral circumflex femoral artery directly from the femoral artery with a normal emergence of medial circumflex femoral artery from profunda femoris artery. While on the right side of the same Cadaver, the profunda femoris artery arose at usual distance i.e., 3.7cm below inguinal ligament, from posterolateral aspect of femoral artery and then it bifurcates into lateral and medial circumflex femoral artery.

Conclusion - Current examination will assist the clinicians to bypass iatrogenic inconveniences during a surgical procedure and will likewise help them in methodology for interventional radiology around this region.

KEYWORDS : profunda femoris variation , lateral circumflex artery , medial circumflex artery, femoral artery

INTRODUCTION

The profunda femoris is a large branch that arises postero-laterally from the femoral artery at a distance of 3.5cm distal to inguinal ligament.[1] At first, it is present laterally to the femoral artery and then spirals around femoral vein to reach medial side of thigh. From here it passes between pectineus and adductor longus, then between the adductor longus and adductor brevis, later it descends between adductor longus and adductor magnus. Lastly it penetrates adductor magnus to anastomose with the upper muscular branches of the popliteal artery. This terminal part is sometimes named the fourth perforating artery. The profunda femoris artery is the major source of blood supply to the adductor, extensor and flexor muscles, anastomosing with the internal and external iliac arteries above and also with the popliteal artery .[2]

The lateral circumflex femoral artery is the largest branch of profunda femoris artery. It arises from profunda femoris near its origin and runs laterally between the divisions of the femoral nerve, posterior to sartorius and rectus femoris, and thus dividing into ascending, transverse and descending branches. The medial circumflex femoral arises from the profunda femoris in the femoral triangle. The artery passes with pectineus and iliopsoas and afterwards inferior to obturator externus above adductor muscles. [3]

Known Variations of Artery [4]

The profunda femoris artery sometimes arises from the posterior aspect of the femoral artery, and more rarely from the medial aspect. If it arises posteriorly, it may cross anterior to the femoral vein and then pass backwards around its medial side.

The lateral circumflex femoral artery may arise from the femoral artery or as a common trunk with the profunda femoris artery and the medial circumflex femoral artery.

The medial circumflex artery sometimes originates from the femoral artery itself or as a common trunk with either the profunda femoris artery or the lateral circumflex femoral artery or both.

MATERIALS AND METHODS

The study was undertaken on lower limb of a 55 year old (12/F/07-20) formalin embalmed female cadaver available in the department of anatomy (*Sharir Rachana*), during the routine dissection for teaching undergraduate and post graduate medical students. Femoral triangle region was dissected according to steps given in Cunningham's manual for dissection of lower limbs. The skin flap was raised followed by removal of superficial fascia. The superficial inguinal lymph nodes in proximity of superficial vessels were identified and removed and the fascia lata was incised into two flaps thereby exposing the femoral triangle. The femoral artery and its major branches were identified.

RESULT

In this female cadaver on left side of lower limb, there was strange origin of lateral circumflex femoral artery directly from femoral artery with a normal emergence of medial circumflex femoral artery from profunda femoris artery. While on the right side of the same Cadaver, the profunda femoris artery arose at usual distance i.e., 3.7cm below inguinal ligament, from posterolateral aspect of femoral artery and then it bifurcates into lateral and medial circumflex femoral artery.

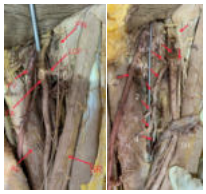

FIG 1.1
Left side of thigh showing variational emergence of LCF directly from FA.
FN: Femoral Nerve,
LCF: Lateral Circumflex femoral artery
FV: Femoral Vein
FA: Femoral Artery
AL: Adductor Longus Muscle
SR: Sartorius Muscle

FIG 1.2 Left side of thigh of same cadaver showing emerging of MCF from PFA
FN: Femoral Nerve
LCF: Lateral Circumflex Artery
FA: Femoral Artery
MCF: Ascending branch of Medial Circumflex Artery
PFA: Profunda Femoris Artery
GSV: Great Saphenous Vein
1: First Perforating Branch of PFA
2: Second Perforating Branch of PFA
3: Third Perforating Branch of PFA
4: Fourth Perforating Branch of PFA

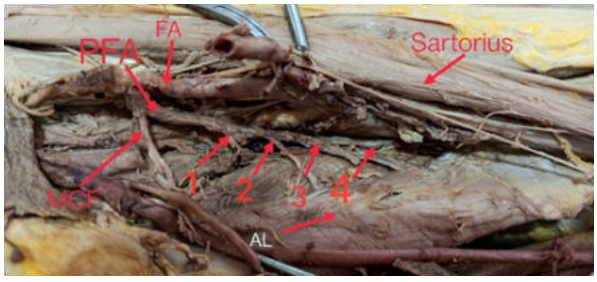

FIG 1.3
Left side of thigh of same cadaver showing profunda femoris artery along with its four perforating branches.
FA: Femoral Artery
PFA: Profunda Femoris artery
SA: Sartorius Muscle
MCF: Medial Circumflex Artery
1: First Perforating Branch of Profunda Femoris Artery
2: Second Perforating Branch of Profunda Femoris Artery
3: Third Perforating Branch of Profunda Femoris Artery
4: Fourth Perforating Branch of Profunda Femoris Artery
AL: Adductor Longus Muscle
AL: Adductor Longus

DISCUSSION

Arteriography still remains the main line of investigation in peripheral occlusive arterial diseases even decades after the advent of highly advanced imaging techniques. Peripheral angiograms are used to detect peripheral occlusive arterial disease conditions, suspected vascular anomalies (often congenital) and related malignancies, arterial status in trauma and for identifying inherited diseases of arteries. The femoral artery and profunda femoris artery is frequently used for arteriography, ultrasound and doppler imaging, digital subtraction angiography and magnetic resonance imaging. Now a days profunda femoris artery is also used for haemodialysis apart from femoral artery. Also in breast reconstruction surgery in case of Ca breast , perforators of profunda femoris artery are used .

INCIDENCES - The profunda femoris artery arose from the posterolateral aspect of the femoral artery in 62.5% of the cases. The profunda femoris artery originated from the posterior side of the femoral artery in 31.25% and 44.64% cases as found in different studies (Prakash *et al.,* 2010 and Siriporn *et al.,*2012) studies respectively.[5] In this female cadaver on left side of lower limb, there was strange origin of lateral circumflex femoral artery directly from femoral artery with a normal emergence of medial circumflex femoral artery from profunda femoris artery. While on the right side of the same Cadaver, the profunda femoris artery arose at usual distance i.e., 3.7cm below inguinal ligament, from posterolateral aspect of femoral artery and then it bifurcates into lateral and medial circumflex femoral artery.

Chances of origin of lateral circumflex femoral artery and medial circumflex femoral artery directly from femoral artery in 10% and 12.5% of cases respectively as described by Eswari *et al.,* 2013 .[6] Dixit et al noted the origin of lateral circumflex femoral artery and medial circumflex femoral artery from femoral artery above the origin of profunda femoris artery in 5.2% and 18.4% respectively. [7] Baptist M et al have also reported the origin of lateral circumflex femoral artery from the femoral artery (Baptist *et al.,* 2007).[8] The variations in the emergence of lateral circumflex femoral artery is of clinical importance as position of lateral circumflex femoral artery is an important landmark for femoral nerve block becasuse it passes between femoral nerve divisions(Orebaugh, 2006).[9] Knowledge of varied origins of medial circumflex femoral artery is essential to avoid iatrogenic vascular necrosis of head of femur in reconstructive surgery of hip (Gautier *et al.,* 2000).[10]

CONCLUSION

In this study , we found that in left lower limb , In this female cadaver on left side of lower limb, there was strange origin of lateral circumflex femoral artery directly from femoral artery with a normal emergence of medial circumflex femoral artery from profunda femoris artery. While on the right side of the same Cadaver, the profunda femoris artery arose at usual distance i.e., 3.7cm below inguinal ligament, from posterolateral aspect of femoral artery and then it bifurcates into lateral and medial circumflex femoral artery.

The knowledge of variations in the level of origin and branching pattern of profunda femoris artery is important to assist the clinicians to bypass iatrogenic inconveniences during a surgical procedure and will likewise help them in methodology for interventional radiology around this region.

ACKNOWLEDGEMENTS

I sincerely acknowledge and pay off my gratitude towards the female cadaver which become our immense source of knowledge and research. I want to give a vote of thanks to my respected teachers who guided a lot during dissection of the body.

CONFLICTS OF INTEREST – NONE

REFERENCES

1. Susan Standring, Gray's Anatomy, 41st edition, Chapter 80 , page no.1369, published by Churchill livingstone, Robert Stevenson house,1-3 baxter's place, Leith walk, Edinburgh.
2. Susan Standring, Gray's Anatomy, 41st edition, Chapter 80 , page no.1369, published by Churchill livingstone, Robert Stevenson house,1-3 baxter's place, Leith walk, Edinburgh.
3. Susan Standring, Gray's Anatomy, 41st edition, Chapter 80 , page no.1369, published by Churchill livingstone, Robert Stevenson house,1-3 baxter's place, Leith walk, Edinburgh.
4. Susan Standring, Gray's Anatomy, 41st edition, Chapter 80 , page no.1369, published by Churchill livingstone, Robert Stevenson house,1-3 baxter's place, Leith walk, Edinburgh.
5. Prakash KJ, Kumar BA, Jose BA, Yadav Kumar S, Singh G.2010. Variations in the origins of the profunda femoris and the medial and the lateral femoral circumflex arteries: a cadaver study in the Indian population. *Rom J Morphol Embryol.*, 51(1):167–70.
6. Eswari AK, Hemanth Kommuru, Satyalakshimi V, Swayam Jothi S. 2013. Profunda femoris artery and its branching pattern and variations. *Int J Anat Sci.*, 4(1):3-8.
7. Dixit DP, Mehta LA, Kothari ML. 2001. Variations in the origin and course of profunda femoris. *J Anat Soc India*, 50(1):6-7.
8. Baptist M, Hussain T, Sultana F. 2007. The origin of the Profunda Femoris Artery. *Professional Med J.*, 14:523-7.
9. Orebaugh SL. 2006. The femoral nerve and its relationship to the lateral circumflex femoral artery. *Anat Rec.*, 102(6):1859-62.
10. Gautier E, Ganz K, Krügel N, Gill T, Ganz R, 2000. Anatomy of the medial femoral circumflex artery and its surgical implications. *J Bone Joint Surg Br.*, 82(5):679-683.