International Journal of Biomedical And Advance Research

ISSN: 2229-3809 (Online)
Journal DOI:10.7439/ijbar
CODEN:IJBABN

Research Article

A study of variation in origin of profunda femoris artery and its branches

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Abstract

Objectives: a) To study location of origin of profunda femoris artery. b) To study location of origin of lateral and medial circumflex femoral artery. c)To note the concordace of observations with previous studies and any significant variation from them.

Materials and Methods- In the present study, dissection was performed on 60 lower extremities of 30 embalmed cadavers in the department of anatomy, Dr. D.Y. Patil Medical College, Kolhapur. Prevalence of the mode and configurations of origins of the profunda femoris artery,medial and lateral femoral circumflex arteries were observed.

Result: In our study we found that Profunda femoris artery was originating from the femoral artery 37.12 mm distal to the midpoint of the inguinal ligament. The lateral and medial femoral circumflex arteries were originating directly from femoral artery in 15% and 22% of extremities respectively.

Conclusion: Clinicians and surgeons should be fully aware with such variations while performing any invasive, diagnostic and therapeutic procedures.

Keywords: Profunda femoris artery, Medial circumflex femoral artery**,** Lateral circumflex femoral artery

1. Introduction

The blood vascular system seems to vary a lot in normal individual. Knowledge of anatomy of vessels is important for various vascular surgeries, interventional radiological procedure and plastic & reconstructive surgeries. Profunda femoris artery is also called as deep femoral artery. It is a large branch that arises laterally from the femoral artery 3.5cm distal to the inguinal ligament[1].Lateral circumflex femoral artery is a laterally running branch given off near the root of the profunda but may arise from femoral artery. Medial circumflex is the other branch which may be given of from femoral artery. These vessels are useful for the doppler imaging,ultrasound, arteriography, angiography and also magnetic resonance imaging. Femoral arteriography is the main line for investigation in peripheral occlusive arterial diseases and in diagnosis of suspected congenital anomalies[2]. Since the advent of interventional radiology,the methods of investigation of the cardiac patients have taken a big leap towards this end. On the other hand,combined study on the anatomical variations of the origins of the profunda femoris, medial and lateral femoral circumflex arteries is rare in literature.

2. Materials and Methods

The present work consists of the study of profunda femoris arteries in adult human specimens obtained from cadavers placed for dissection during 2009-2011 in the department of Anatomy,Dr. D.Y. Patil Medical College, Kolhapur. The total number of femoral triangles studied were 60,out of which 46 were males and 14 were females.Contents of the femoral triangle were dissected and the profunda femoris arteries are exposed.

Steps

1. The femoral triangle was dissected by reflecting the skin,superficial fascia and deep fascia.
2. After separating the superficial structures,the femoral artery and profunda femoris arteries were exposed by opening the femoral sheath.
3. After dissecting and exposing the artery the following observations were made under the following parameters.

a) Cadaver number.

b) Origin of the profunda femoris artery.

c) Distance from midpoint of inguinal ligament in mm.

d) Origin of circumflex femoral arteries.

e) Distance of origin of circumflex femoral artery from origin of profunda femoris artery in mm.

f) The variations regarding site & level of origin of the branches of the artery were also noted.

3. Result

Table-1 Showing levels of origin of Profunda femoris artery,lateral circumflex and madial circumflex arteries

	PFA*		LCFA**		MCFA***	
Range(mm)	RT	LT	RT	LT	RT	LT
01-10 mm	00	00	04	02	01	02
11-20 mm	00	00	05	06	06	06
21-30 mm	05	02	14	14	08	09
31-40 mm	18	21	02	03	05	03
41-50 mm	05	06	00	00	02	02
51-60 mm	02	01	00	00	00	00

* PFA(profunda femoris artery),**LCFA(lateral circumflex femoral artery)

***MCFA(medial circumflex femoral artery)

Table-2 Showing mode of origin of Profunda femoris artery,lateral circumflex and madial circumflex arteries

Artery	LCFA		MCFA	
Mode of origin	RT	LT	RT	LT
Profunda Femoris Artery	25	25	22	22
Femoral Artery	04	05	06	07
Common Trunk	01	00	02	01

4. Discussion

The average distance of origin of profunda femoris from the midpoint of inguinal ligament was found to be 37.12 mm which is comparable with average distance found by Bannister[3] (35mm), Vuksanovic[4] (37.5mm). This distance was less than the average distance of origin reported in the literature by Dixit *et al*[2](47.5mm), Siddharth *et al*[5](44mm) and Prakash *et al*[6](42mm).

Quain[7] (1844) found that the distance from the inguinal ligament of the origin of the profunda femoris artery (In 430 thighs) was between 2.5 and 5.1 cm in 68%; of these it was between 2.5 and 3.8 cm in 42.6%.This distance was less than 2.5 cm in 24.6% of the thighs and more than 5.1 cm in only7.4%.Quain's[7] data are as follows:origin at the inguinal ligament, 07cases; 0-1.3cm below the inguinal ligament,13cases; 1.3-2.5 cm below,86cases; 2.5-3.8 cm below,183cases; 3.8-5.1 below, 109cases; 5.1-6.3 below,19cases; 6.6-7.6 cm below, 12cases; and 11.6 below,1 case.

In our study the lateral circumflex femoral artery mostly (83.33%) originated from the profunda femoris artery. This is the commonest pattern of origin of this artery sited in the literature. The figure was 77.3% in Turkish population[8], whereas in Indian populatio it is 81.25%[6] and in Dixit *et al*[2]83.34%.In 15% specimens it originated from common femoral artery,which can be compared favourably with Prakash *et al*[6](18.75%) and Uzel[8](19.1%). The remaining1.67% of cases it originated from a common trunk for profunda femoris artery and LCFA. As compared to this Dixit *et al*[2]found in 12.5% of specimens LCFA,originating in common with Profunda femoris artery.

The average distance of the origin of lateral circumflex artery from the profunda femoris artery in our study is found to be 21.2mm which is similar to the observation made by Prakash *et al*[6](25mm).It was found to be as high as 48mm± 12mm in Turkish population[8] and as low as 15mm in Indian population[5].

The medial circumflex artery on an average arose in 73.33% of specimens from the profunda femoris artery which is similar to the finding by Tanyeli[9](79%) and Prakash[6](76.2%). Dixit *et al*[2] found it to orginate from profunda femoris artery in 62.5% , which is close to Siddharth[5](63%) but Gautier[10]found it to be 83.3%.The proportion of medial circumflex femoral artery originated from the common femoral artery in this study is 21.67% which is in between the findings of Prakash *et al*[6](32.8%) and Tanyeli[9](15%).

The average distance of the origin of medial circumflex artery from the profunda femoris artery in our study was found to be 24.38mm which is similar to Prakash *et al*[6] (20mm).Thus the origin of circumflex arteries is placed very close to the root of the profunda artery. This matches with the classical text book description.

Conclusion

This knowledge is very valuable in preventing iatrogenic injury to these vessels during surgical procedures around the femoral triangle. Though these variations were in addition to the usual anatomic description; surgeons can be aware of such variations while performing some invasive procedures on the femoral artery and its branches. It is concluded therefore that the clinicians and surgeons should be fully aware with such variations while performing any invasive,diagnostic and therapeutic procedures on the proximal part of the femoral artery and its branches; especially the Profunda femoris artery.

Reference

1. Standring S. Gray's Anatomy. 40thEd, Edinburgh. Elsevier Churchill Livingstone Publishers; 2008.p,1379–1380.
2. Dixit DP, Mehta LA, Kothari ML. Variations in the origin and course of profunda femoris. *J Anat Soc India*. 2001;50(1):6–7.
3. Bannister LH, Berry MM, Collins P. Cardiovascular system. In: Gray's Anatomy: the anatomical basis of Medicine and Surgery.38th edition. Churchill Livingstone, London; 1995.p,1566–1568.
4. Vuksanovic BA, Stefanivic N, Pavlovic S, Đuraskosvic R, Randelovic J.Analysis of deep femoral artery origin variances on fetal material.*Facta Universitatis: Medicine and Biology.*20071;4(3):112–116.
5. Siddharth P, Smith NL, Mason RA, Giron F.Variational anatomy of the deep femoral artery. *Anat Rec*.1985;212: 206–209.
6. Prakash, Kumari J, Kumar AB, Betty AJ, Kumar SY, Singh G. Variations in the origins of the profunda femoris, medial and lateral femoral circumflex arteries: a cadaver study in the Indian population. *Romanian Journal of Morphology and Embryology.*2010;51(1):167–170.
7. Quain R. Anatomy of the arteries of the human body. London:Taylor & Walton; 1844.p,447-525.
8. Uzel M, Tanyeli E, Yildirim M. An anatomical study of the origins of the lateral circumflex femoral artery in the Turkish population. *Folia Morphol (Warsz).* 2008;67(4):226–230.
9. Tanyeli E,Uzel M, Yildirim M, Celik HH. An anatomical study of the origins of the medial circumflex femoral artery in the Turkish population.*Folia Morphol (Warsz).* 2006;65(3):209–212.
10. Gautier E, Ganz K, Krugel N, Gill T, Ganz R. Anatomy of the medial femoral circumflex artery and its surgical implications.*J Bone Joint Surg Br.* 2000;82(5):679–683.