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RESEARCH ARTICLE

CLINICAL ANATOMY AND VARIATION OF PROFUNDA FEMORIS ARTERY- CASE SERIES

Dr. Sowmya S.[1], Dr. Abhijit Patil[2] and Dr. Ayyali Ambaresh[3]

1. Associate Professor, Dept. of Anatomy, Shri AtalBihari Vajpayee Medical College & RI, Bangalore.
2. Assistant Professor, Dept. of Orthopedics, Bangalore Medical College & RI, Bengaluru.
3. Assistant Professor, Dept. of General Medicine, Shri AtalBihari Vajpayee Medical College & RI, Bangalore.

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Abstract

Background: The profundafemoris artery (PFA) or deep femoral artery is a large branch that arises posterolaterally from femoral artery (FA) distal to the inguinal ligament. Primary source for the blood supply of the head of the femur is the mainly by the deep branch of profundafemoris artery (Medial circumflex artery). In the indication and choice of profundaplasty, vascular reconstructive procedure, the knowledge of the anatomy of PF may be particularly important for the clinicians dealing with them.

Objectives: The study aimed at study of origin and branching pattern of PF, b. Correlation with surgical aspect of PF.

Material & Methods: The present study was conducted in 10 formalin-fixed lower limbs from the Department of Anatomy, Shri AtalBihari Vajpayee Medical college& RI, Bangalore& Bangalore Medical college & Research Institute. Dissection of PFA and its branches were carried out & the following parameters were observed and photographed.

Results: Origin of PF was posterolateral in 6cases , posterior in 3, & lateral in 1 to FA. Origin of MCFA was from PFA in 9cases & FA in 1. The mean distance of origin of MCFA was 1.8 cm (range 0.1-8.5 cm). Origin of LCFA was from PFA in 9 cases & FA in 1. The mean distance of origin of LCFA was 2.3 cm (range 0.3-7 cm)

Conclusion: Knowledge of PFA is very important for surgeons to prevent iatrogenic injury as well as during profundoplasty as it is sole artery to supply majority of thigh region. Knowledge of variations in profundafemoris and its branches helps surgeons during preoperative clinical evaluation for surgical and interventional revascularization of the ileo-femoral and femoro-popliteal segments, in open canulation of femoral artery for cardiopulmonary bypasss, in radiological interventions for A-V malformations, and in salvage operations for traumatic limb ischemia.

Introduction:-

The profundafemoris artery (PF) or deep femoral artery is a large branch that arises laterally from FA about 3.5cm distal to the inguinal ligament. At first lateral to FA, it spirals posterior to this and the femoral vein to reach the

Corresponding Author:- Dr. Sowmya S.
Address:- Associate Professor, Dept. of Anatomy, Shri AtalBihari Vajpayee Medical College & RI, Bangalore.

medial side of the femur. It passes between pectineus and adductor longus, then between the latter and adductor brevis, before it descends between adductor longus and adductor magnus. It pierces adductor magnus and anastomoses with the upper muscular branches of the popliteal artery. This terminal part is sometimes named the fourth perforating artery[1].The artery takes part in the cruciate anastomosis and trochanteric anastomosis. The primary source for the blood supply of the head of the femur is the deep branch of the MCFA. In posterior approaches to the hip and pelvis the short external rotators are often divided. In all these conditions need precise knowledge of anatomy of PFA. Hence in this study an attempt is made to study the branching pattern of PF[2].

Material & Methods:-

The present study was conducted in 10 formalin-fixed lower limbs from the Department of Anatomy, ShriAtalBihariVajpayeeMedical college & RI, Bangalore , and Bangalore Medical College and Research Institute, Bangalore. Dissection of PFA and its branches were carried out & the following parameters were observed.

1. Origin of PF from FA
2. Distance of origin of its branches

Results:-

Mean distance of PF (FIG.1)from MIP was 4.8 cm (ranging from 0-7 cm).

Distance from MIP (cm)	No. of PFA taking origin
0 – 3 cm	3
3 – 7 cm	7

Origin of PF (FIG 2)wasposterolateral in 6 cases posterior in 3, & lateral in 1 to FA. In one case it is directly from external iliac artery.

Origin of MCFA was from PFA in 9 cases & FA in 1.

Origin of LCFA was from PFAin 9 cases& Fain 1 (Fig3).

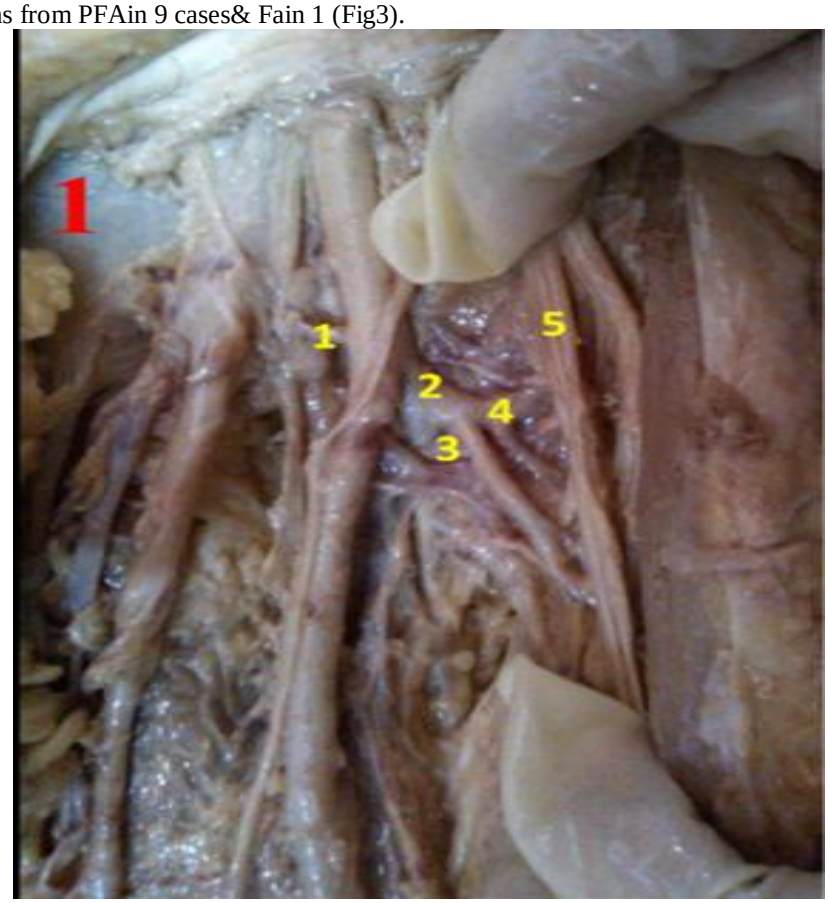

Fig.1:- Specimen showing normal origin &branching pattern of FA & PFA.

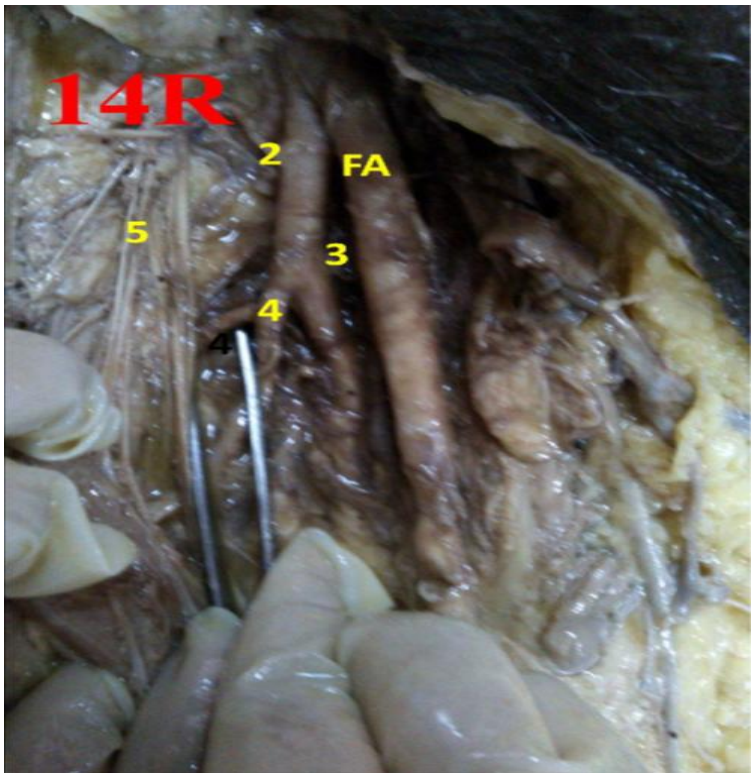

Fig. 2:- Specimen showing high origin of PFA from External iliac artery.

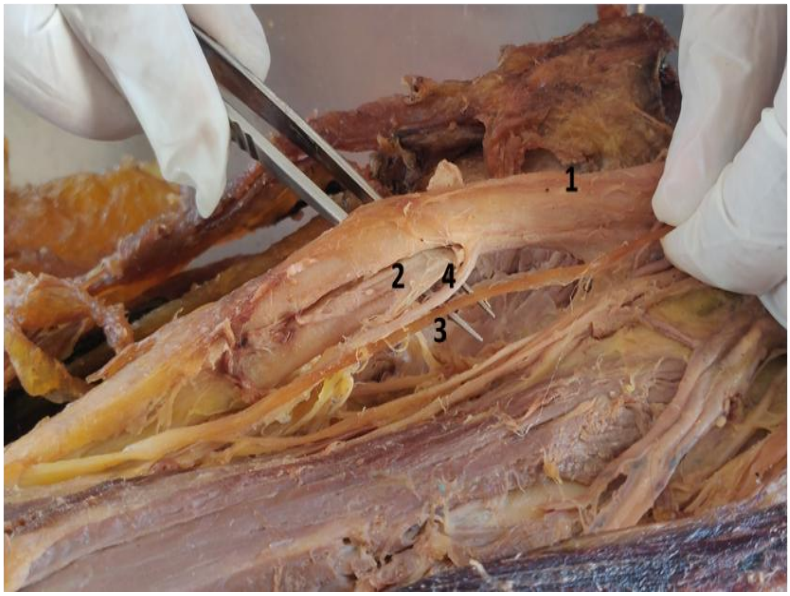

FIG 3:- Picture showing LCFA taking origin directly from FA.
1-FA, 2- PFA, 3- MCFA, 4- LCFA

Discussion:-

The commonest range of origin of PFA usually from 21 to 40 mmon right side and 11 to 40 mm on left side, both circumflex arteries originated from PFA. Medial side origin of PFA is rare[3]. Out of 40 limbs studied, in 35 limbs profundafemoris artery originated from femoral artery at an average of about 3.76cm from mid-inguinal point. In 3 cases (7.5%) the origin of profundafemoris artery from the mid inguinal point was less than 2 cms and in one case profundafemoris artery took orgin 5.7cm below the inguinal ligament[4]. In 13 limbs (19.69%) profundafemoris artery

took origin as a common stem along with one of circumflex arteries while in three limbs (4.54%) trifurcation was observed, that is origin of profundafemoris and two circumflex arteries from single site. In four limbs (6.06%), superficial branches of femoral artery took origin from profundafemoris artery instead of femoral artery[5].There was a positive correlation between the calibre of PFA andfemoral artery. The most common variation in the branching pattern of PFA was lateral circumflex femoral artery arising from the femoral trunk, origin of PFA in the postero-lateral side of FA was 8 (53.33%)[6]. The mean distance between MIP and the site of origin of PFA was 4.3 ± 1.13 cm on the right side and on the left side it was 4.3 ± 1.08 cm. We also found that there was a high origin of PFA in 3 cases (5.8%) on the right side and in 4 cases (7.8%) on the left side. In two lower limbs, there was bilateral higher origin of PFA[7].

The profundafemoris artery was originating abnormally from the femoral artery. Out of 102 limbs that were studied, 47 limbs (46.07%) originated from posterolateral aspect, 20 limbs (19.60%) on lateral aspect, 11 limbs (10.78%) on medial aspect, 24 limbs (23.52%) on posterior aspect of femoral artery. High origin of profundafemoris artery (0- 10 mm) from femoral artery (distance from the midpoint of inguinal ligament) was seen in 2 limbs[8].The circumflex femoral arteries among 228 lower limbs commonly sprung from PF. The distance of origin of MCFA from origin of PFA was between 2-3cm on right side while on left side it was between 1- 3cm[9].

Conclusion:-

FA and its branches are frequently affected by atherosclerosis. If PF is blocked, pain develops in the thigh muscles during walking. The present study could throw light on variations in origin & branching pattern of FA & its branches so that many complications could be avoided during surgeries. Surgeon and radiologist shouldconsider this variation in mind during vascular invasion and surgeries in femoral region.This study will help the clinicians to avoid iatrogenic complications and also help them in various clinical procedures like puncture of femoral artery for interventional radiology.

Reference:-

1. Standring S. Pelvic Girdle,Gluteal region and Thigh. Grays Anatomy. 40th ed. New York; Elsevier Churchill Livingstone: 2008.p1378-80.
2. Standring S. Gray's Anatomy. The Anatomical basis of clinical practice. 39th ed. Edinburgh: Elsevier Churchill Livingstone, 2005: p. 1451.
3. Sangeetha JR et al. "Cadaveric Study of ProfundaFemoris Artery with Some Unique Variations", J. ClinDiagn Res, 2015 May; 9(5): AC01–AC03
4. HemaNagpal. "Variations in the origin of profundafemoris artery and its branches – a cadaveric study", Int. J Current Research, Vol 9, Issue 12,63678-63681
5. Rajani SJ et al, "Cadaveric Study of ProfundaFemoris Artery with Some Unique Variations", J. ClinDiagn Res, 2015 May;9(5):AC01-3.
6. AshwiniAppaji, Sanjay C Desai. "Morphometry of profundafemoris artery and itscorrelation with femoral artery: a cadaveric study", Int J Anat Res, 2017, Vol 5(4.3):4770-75. ISSN 2321-4287
7. Vaishali PA, Lakshmi R, "A study of profundafemoris artery in cadavers", Int J Cur Res Rev | Vol 6 • Issue 21 • November 2014.
8. Brijesh R.A, Sujatha. K,Taqdees F, "Morphological study of origin of profundafemoris artery in human cadavers", Int J Anat Res 2015, 3(3):1376-80. ISSN 2321-4287.
9. Dixit D, DharatiM,Kubavat B, Sureshbhai P, Rathod C, Mital M. Pateld, Tulsibhai C. Singele. A Study of Variations in The Origin Of ProfundaFemoris Artery And Its Circumflex Branches. Int J Biol Med Res. 2011; 2(4): 1084 – 1089.