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ORIGINAL RESEARCH

Assessment of variation of profunda femoris artery

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ABSTRACT

Background: The profunda femoris artery is the main artery supply of the thigh arising from the lateral side of the femoral artery about 3-4 cm distal to the inguinal ligament. The present study was conducted top assess variation of profunda femoris artery.

Materials & Methods: 50 cadaveric specimens of lower limbs obtained and the PFA was identified and its site and mode of origin were recorded. The distance between the origin of PFA from the FA and the mid inguinal point (MIP) was measured. The relation of profunda femoris artery to FA at its origin was recorded. The mode of origin and pattern of origin of PFA from the femoral artery were also recorded.

Results: Site of origin of femoral artery was lateral in 21% on right side and left in 20%, posterior in 9% on right and 6% on left, medial in 5% on right and 5% in left, antero- lateral in 4% right and 5% left, postero- medial in 3% right and 5% left and postero- lateral in 56% right and 60% left. The distances of origin PFA from MIP was 0-3 cm in 10% left side, 3-6 cm in 65% right and 48% left, 6-9 cm in 2% right and 6% left and 9-12 cm in 33% right and 36% left side. The difference was significant (P< 0.05). Pattern of origin of profunda femoris artery was Common trunck with MCFA in 1% left, common trunck with LCFA in 4% left and trifurcation in 2.4% right side. The difference was significant (P< 0.05).

Conclusion: Variations in the origin of profunda femoris artery and its circumflex branches are very commonly encountered. Knowledge of variations in the origin of these arteries is very important for surgeons while performing surgical procedures in the thigh to avoid complications.

Key words: profunda femoris artery, circumflex branches, surgeons

INTRODUCTION

The profunda femoris artery is the main artery supply of the thigh arising from the lateral side of the femoral artery about 3-4 cm distal to the inguinal ligament. Lateral and medial circumflex femoral arteries, arise from the profunda femoris artery from the lateral and medial side respectively. The profunda femoris artery is frequently incorporated in the vascular reconstructive surgery.[1]

Clinicians name the FA above the origin of PFA as the common femoral artery and that below the origin of the profunda femoris artery as the superficial femoral artery. The PFA supplies muscles of extensor, flexor and adductor compartments, also the head and neck of femur.[2] The FA and PFA are usually used for catheterization in various diagnostic

procedures.[3] Due to the relation of PFA with the femur and the hip bone there may be chances of development of aneurysms after penetrating injuries during internal and external fixation of hip bone, and during catheterization.[4] In the majority of the cases studied, the PFA is seen to take origin from the postero-lateral aspect of the femoral artery (60%) while in 20% cases they arose laterally from it. Other origins even though fewer in numbers were also noted: posterior 7%, medial 2%, anterolateral 2% and postero-medial 3%.[5] The present study was conducted top assess variation of profunda femoris artery.

MATERIALS & METHODS

The present study comprised of 50 cadaveric specimens of lower limbs obtained in Anatomy department. The study was approved from ethical committee of institute.

The midpoint of the inguinal region (MIP) was marked. Using surgical scalpel a skin incision was made from the anterior superior iliac spine to the pubic tubercle and a vertical incision 15 cm long down from the MIP. The skin was reflected and the inguinal ligament and femoral vessels were exposed by dissection. The PFA was identified and its site and mode of origin were recorded. The distance between the origin of PFA from the FA and the mid inguinal point (MIP) was measured. The relation of profunda femoris artery to FA at its origin was recorded. The mode of origin and pattern of origin of PFA from the femoral artery were also recorded. Results of the study was compiled and assessed statistically. P value less than 0.05 was considered significant (P< 0.05).

RESULTS

Table I Site of origin of profunda femoris artery

Site	Right	Left	P value
Lateral	21%	20%	0.94
Posterior	9%	6%	
Medial	5%	5%	
Antero-lateral	4%	5%	
Postero- medial	3%	9%	
Postero-lateral	56%	60%	

Table I shows that site of origin of femoral artery was lateral in 21% on right side and left in 20%, posterior in 9% on right and 6% on left, medial in 5% on right and 5% in left, antero-lateral in 4% right and 5% left, postero- medial in 3% right and 5% left and postero- lateral in 56% right and 60% left. The difference was non- significant (P> 0.05).

Table II Distances of origin PFA from MIP

Distance (cm)	Right	Left	P value
0-3	0	10%	0.04
3-6	65%	48%	
6-9	2%	6%	
9-12	33%	36%	

Table II shows that distances of origin PFA from MIP was 0-3 cm in 10% left side, 3-6 cm in 65% right and 48% left, 6-9 cm in 2% right and 6% left and 9-12 cm in 33% right and 36% left side. The difference was significant (P< 0.05).

Table III Pattern of origin of profunda femoris artery

Pattern	Right	Left	P value
Common trunck with MCFA	0	1%	0.04
Common trunck with LCFA	0	4%	
Trifurcation	2.4%	0%	

Table III shows that pattern of origin of profunda femoris artery was common trunck with MCFA in 1% left, common trunck with LCFA in 4% left and trifurcation in 2.4% right side. The difference was significant (P< 0.05).

DISCUSSION

The knowledge of variations in height of origin of profunda femoris artery and its branches is of great significance for preventing flap necrosis, particularly tensor fascia latae, when used in plastic and reconstructive surgery.[6,7] Gautier et al stated that the precise knowledge of anatomy of medial circumflex femoral artery is essential while performing both trochanteric and intertrochanteric osteotomies and is also helpful to avoid iatrogenic vascular necrosis of the head of the femur in reconstructive surgery of hip and fixation of acetabular fractures through the posterior approach.[8] The present study was conducted top assess variation of profunda femoris artery.

We found that site of origin of femoral artery was lateral in 21% on right side and left in 20%, posterior in 9% on right and 6% on left, medial in 5% on right and 5% in left, antero-lateral in 4% right and 5% left, postero- medial in 3% right and 5% left and postero- lateral in 56% right and 60% left. Ambath et al[9] in their study 24 lower limbs were dissected. Majority of profunda femoris artery arise from a posterolateral aspect of femoral artery at a distance of 21-41mm away from the midpoint of inguinal ligament. Whereas majority of lateral circumflex femoral artery arise from the lateral aspect of profunda femoris artery at a distance of 11-40 mm away from the origin of profunda femoris. Majority medial circumflex femoral artery arises from the medial aspect of femoral artery at a distance of 11-30 mm away from origin of the profunda femoris artery.

We observed that distances of origin PFA from MIP was 0-3 cm in 10% left side, 3-6 cm in 65% right and 48% left, 6-9 cm in 2% right and 6% left and 9-12 cm in 33% right and 36% left side. George et al[10] explored the varying positions of the origin of the profunda femoris artery from the femoral artery. In 63.3% of the cases, PFA was found to arise postero-laterally from the FA, while in 21.5% of cases it took origin laterally from it. In majority of the cases, the PFA arose at a distance of 3-6 cms from midinguinal point while a considerable number originated more distally.

We found that pattern of origin of profunda femoris artery was Common trunck with MCFA in 1% left, common trunck with LCFA in 4% left and trifurcation in 2.4% right side. Umez M et al[11] stated that 77.3% of the LCFA arise from the PFA and 22.7% arise from the femoral artery. Fukuda H et al[12] also found that majority of LCFA arise from PFA. Bergman et al[13] pointed out that if PFA arises from the medial aspect of FA, then FA may split into three vessels of almost equal caliber that are PFA, FA and lateral circumflex arteries.

CONCLUSION

Authors found that variations in the origin of profunda femoris artery and its circumflex branches are very commonly encountered. Knowledge of variations in the origin of these arteries is very important for surgeons while performing surgical procedures in the thigh to avoid complications.

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