

Unusual Branches of Femoral Artery in the Femoral Triangle – A Case Report

Ramas Inusuales de la Arteria Femoral en el Triángulo Femoral – Reporte de Caso

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SUMMARY: Femoral artery is the major artery of the lower limb. It shows some variations in its branching pattern. One of the rare but clinically important variations is the origin of deep circumflex iliac and inferior epigastric arteries from it instead of from external iliac artery. We report here the origin of inferior epigastric and deep circumflex iliac arteries from the femoral artery bilaterally. Both the arteries passed up deep to the inguinal ligament and had a normal course and distribution after crossing the inguinal ligament. Knowledge of these variations is of importance in plastic surgery, anterior approach to the hip joint, draining psoas abscess or reducing a femoral hernia.

KEY WORDS: Femoral artery; deep circumflex iliac artery; Inferior epigastric artery; Femoral triangle; Anatomical variation.

INTRODUCTION

Femoral artery is the continuation of the external iliac artery. It starts behind the inguinal ligament at the midinguinal point. It runs downwards in the front of the thigh and terminates by continuing as the popliteal artery after crossing the adductor opening (hiatus magnus) of adductor magnus muscle. The artery lies between the femoral vein and the femoral nerve. It generally gives three superficial (superficial epigastric, superficial circumflex iliac and superficial external pudendal) and three sets of deep branches (deep external pudendal, muscular and profunda femoris) in the femoral triangle.

The inferior epigastric artery is normally a branch of external iliac artery. It runs upwards and medially, just medial to the deep inguinal ring and enters the rectus sheath. It anastomoses with the superior epigastric artery in the rectus sheath.

The deep circumflex iliac artery is the branch of external iliac artery. It runs upwards and laterally behind the inguinal ligament and then along the iliac crest. Near the middle of the iliac crest it pierces the fascia transversalis and the transversus abdominis muscle and runs in the neurovascular plane of the abdomen. It supplies the muscles

of the anterior abdominal wall and takes part in the anastomosis at the anterior superior iliac spine.

We observed the low origin of both inferior epigastric and deep circumflex iliac arteries bilaterally.

CASE REPORT

During the dissection classes for the medical undergraduates, we observed bilateral low origin of the deep circumflex iliac and inferior epigastric arteries in a middle aged male cadaver. The variation was bilateral (Figures 1, 2 and 3). The inferior epigastric artery took its origin from the femoral artery and coursed upward and medially in front of the femoral vein. Upon crossing the inguinal ligament, it pierced the fascia transversalis and entered the rectus sheath by passing anterior to the arcuate line. Its course was closely related to the femoral ring. The deep circumflex iliac artery ascended upward and laterally, deep to the inguinal ligament. Its course and distribution above the level of inguinal ligament was normal. The rest of the course and distribution of the femoral artery was normal.

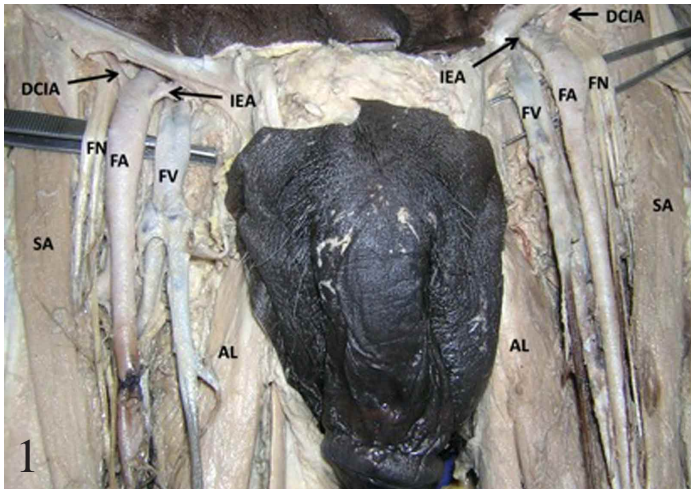


Fig. 1. Dissection of bilateral femoral triangles showing the origin of inferior epigastric and deep circumflex iliac arteries from the femoral artery. (FA – femoral artery; FV – femoral vein; FN – femoral nerve; IEA – inferior epigastric artery; DCIA – deep circumflex iliac artery; SA – Sartorius muscle; AL – adductor longus muscle).

DISCUSSION

Knowledge of origin, course and distribution of inferior epigastric and deep circumflex iliac arteries is important due to its clinical implications. The inferior epigastric artery perforator flaps are exceedingly used in head and neck (Masià *et al.*, 2011), breast reconstruction (Karunanithy *et al.*, 2011) and scar surgeries (Shang *et al.*, 2011). The inferior epigastric artery is known to have variations in its origin. Sañudo *et al.*, (1993) have reported the origin of inferior epigastric, obturator and medial circumflex femoral arteries from a common trunk that arose from the external iliac artery. Bilgic & Sahin (1997) have reported the origin of inferior epigastric, obturator and profunda femoris arteries from a common trunk which arose from the external iliac artery. This variation was found in only 1% of cases. Origin of inferior epigastric artery from the obturator artery is a rare variation and occurs in about 4% of cases (Kawai *et al.*, 2008). Tanyeli *et al.*, (2006) have reported the origin of the inferior epigastric artery from the deep femoral and lateral circumflex femoral artery from the femoral artery.

The origin of the inferior epigastric and deep circumflex femoral arteries from below the level of inguinal ligament is very rare. As the vessels climb to the abdomen behind the inguinal ligament, they may get damaged during surgical procedures in the region. The inferior epigastric artery is more vulnerable because of its close association with the femoral ring and inguinal canal. These arteries might cause unexpected bleeding during anterior approach to the hip joint or during the drainage of psoas abscess.

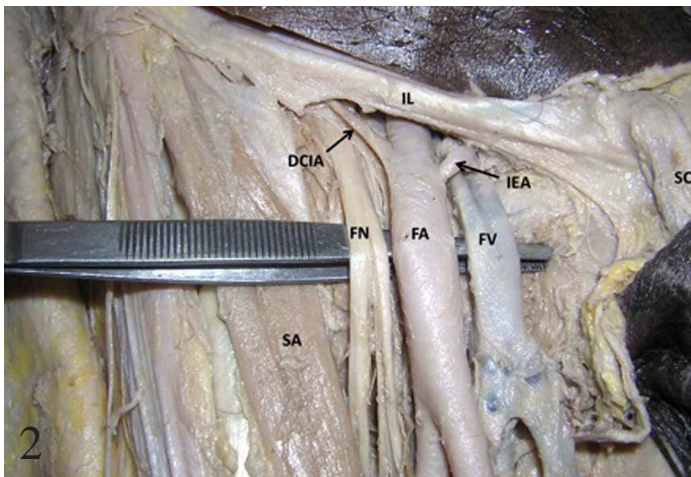


Fig. 2. Dissection of the upper part of right thigh showing the origin of inferior epigastric and deep circumflex iliac arteries from the femoral artery. (FA – femoral artery; FV – femoral vein; FN – femoral nerve; IEA – inferior epigastric artery; DCIA – deep circumflex iliac artery; SA – Sartorius muscle; IL – inguinal ligament; SC – spermatic cord).

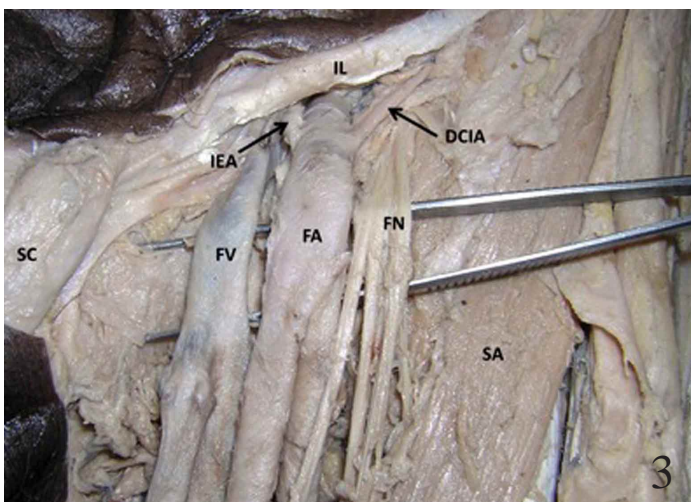


Fig. 3. Dissection of the upper part of left thigh showing the origin of inferior epigastric and deep circumflex iliac arteries from the femoral artery. (FA – femoral artery; FV – femoral vein; FN – femoral nerve; IEA – inferior epigastric artery; DCIA – deep circumflex iliac artery; SA – Sartorius muscle; IL – inguinal ligament; SC – spermatic cord).

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RESUMEN: La arteria femoral es la principal arteria del miembro inferior. Se observan algunas variaciones en su patrón de ramificación. Una variante rara, pero clínicamente importante es el origen común de las arterias circunfleja iliaca profunda y epigástrica inferior no desde la arteria ilíaca externa. Presentamos el origen bilateral de las arterias epigástricas inferiores y circunfleja ilíaca profunda desde la arteria femoral. Ambas arterias pasaron profundas al ligamento inguinal y tuvieron un curso y distribución normal después de cruzar el ligamento inguinal. El conocimiento de estas variaciones son de importancia en la cirugía plástica, en el acceso anterior a la articulación de la cadera, el drenaje absceso del músculo psoas mayor o para reducir una hernia femoral.

PALABRAS CLAVE: Arteria femoral; Arteria circunfleja femoral profunda; Arteria epigástrica inferior; Triángulo femoral; Variación anatómica.

REFERENCES

Bilgic, S. & Sahin, B. Rare arterial variation: a common trunk from the external iliac artery for the obturator, inferior epigastric and profunda femoris arteries. *Surg. Radiol. Anat.*, 19(1):45-7, 1997.

Karunanithy, N.; Rose, V.; Lim, A. K. & Mitchell, A. CT angiography of inferior epigastric and gluteal perforating arteries before free flap breast reconstruction. *Radiographics*, 31(5):1307-19, 2011.

Kawai, K.; Honma, S.; Koizumi, M. & Kodama, K. Inferior epigastric artery arising from the obturator artery as a terminal branch of the internal iliac artery and consideration of its rare occurrence. *Ann. Anat.*, 190(6):541-8, 2008.

Masià, J.; Sommaro, M.; Cervelli, D.; Vega, C.; León, X. & Pons, G. Extended deep inferior epigastric artery perforator flap for head and neck reconstruction: a clinical experience with 100 patients. *Head Neck*, 33(9):1328-34, 2011.

Sañudo, J. R.; Roig, M.; Rodriguez, A.; Ferreira, B. & Domenech, J. M. Rare origin of the obturator, inferior epigastric and medial circumflex femoral arteries from a common trunk. *J. Anat.*, 183 (Pt. 1):161-3, 1993.

Shang, Z.; Zhao, Y.; Ding, H.; Liu, B.; Cao, D. & Wang, B. Repair of hand scars by a dilated deep inferior epigastric artery perforator flap. *J. Plast. Surg. Hand Surg.*, 45(2):102-8, 2011.

Tanyeli, E.; Yildirim, M.; Uzel, M. & Vural, F. Deep femoral artery with four variations: a case report. *Surg. Radiol. Anat.*, 28(2):211-3, 2006.

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