

An unexpected anatomical variant of the femoral artery in a patient with acute lower limb ischemia: case report

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SUMMARY: An unexpected anatomical variant of the femoral artery in a patient with acute lower limb ischemia: case report.

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We report a case of acute embolic ischemia of the right lower limb in a patient with unexpected intraoperative anatomic variant of femoral artery. In this anomaly, the deep femoral artery arises from the external iliac artery, 2 cm above the inguinal ligament, runs with a parallel course with the superficial femoral artery, and placed between the branches of femoral nerve. In consideration of the difficulty to achieved an extensive and optimal control of the external iliac artery with the femoral approach, a retrograde embolectomy of the iliac artery by two separate arteriotomies on the deep and superficial femoral arteries were successful performed.

The literature reviewed about this anomalies. In these unexpected intraoperative cases a ductile and ingenious approach seems to be mandatory to perform a safe operation with low systemic impact.

RIASSUNTO: Una rara anomalia anatomica dell'arteria femorale in un paziente con ischemia acuta dell'arto inferiore: case report.

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Gli Autori riportano un caso di ischemia acuta dell'arto inferiore destro in un paziente con una inaspettata variante anatomica dei vasi femorali evidenziata intraoperatoriamente. Tale anomalia era caratterizzata dall'origine dell'arteria femorale profonda direttamente dall'iliaca esterna. Il vaso a decorso anomalo decorreva tra i rami di divisione del nervo femorale, con un decorso parallelo alla femorale superficiale. In considerazione della difficoltà di ottenere una sufficiente esposizione dell'arteria iliaca esterna attraverso l'accesso femorale, veniva eseguita con successo una embolectomia dell'iliaca esterna per via retrograda mediante due arteriotomie distinte realizzate a livello dell'arteria femorale superficiale e profonda.

Dalla revisione della letteratura varianti anatomiche di questo tipo non appaiono così rare. In considerazione della difficoltà di ottenere una diagnosi preoperatoria, appare necessario un notevole eclettismo per risolvere in modo ottimale tali situazioni, adottando di volta in volta strategie chirurgiche adattate all'anomalia riscontrata.

KEY WORDS: Deep femoral artery - Femoral artery - Anomalies.
Arteria femorale profonda - Arteria femorale - Anomalie.

Introduction

The variations in origin and course of the femoral vessels have been widely described in the literature (1, 2). Sometimes deep and superficial femoral arteries can originate from the external iliac artery and no common femoral artery is present. This anatomic pat-

tern can lead to some technical difficult to achieve an optional proximal control especially in case of acute ischemia of the lower limb due to embolic involvement of the femoral vessels herein. We report a case of acute ischemia of the lower limb due to arterial embolism of the femoral vessels in which the deep and superficial arteries originated from external iliac artery.

Case report

A 72 year old woman was admitted to our Division with diagnosis of acute ischemia of the right lower limb. The patient was affected by atrial fibrillation, ischemic heart disease and severe obstructive respiratory disease. Blood tests, coagulation profile and

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platelet count were normal. The clinical examination reveals a pale ischemia of the lower right limb with paresthesia without motory involvement. At the clinical examination no femoral and peripheral pulses were detected. Contralateral limb was normal with all the pulses. An acute ischemia due to arterial embolus was suspected and the patient was taken to the operating room.

Under local anaesthesia, a standard surgical approach by a longitudinal incision over the course of the femoral artery was carried out. During the surgical dissection we noted that the deep and the superficial femoral arteries arose from the external iliac artery, 2 cm above the inguinal ligament, and ran with a parallel course. Moreover the deep femoral artery was crossed to the major branches of the femoral nerve. The lateral and the medial circumflex arteries, the quadricipital artery and perforating branches arised from deep femoral artery in a separate way.

This unexpected difficult to achieve a safe and easy proximal control of the external iliac artery to perform an optimal embolectomy conditioned a changement in our surgical strategy.

The deep and superficial femoral arteries were extensively mobilized and surrounded with vessel loops. After the heparinization (5000 UI), only proximal clamping of this vessels were carried out and two transverse arteriotomy were performed. A successful disobliteration of the distal vessels by means of n° 3 and n° 4 Fogarty catheters, starting through superficial femoral artery and than with the deep femoral artery, was performed.

With the deep femoral artery clamped the inflow on the superficial femoral artery was carried out by the use no. 5 Fogarty catheter and then, with superficial femoral artery clamped, the same maneuver was repeated on the deep femoral artery to avoid an accidental proximal dislocation of the trombo-embolic materials into the other artery. After the flushing, the arteriotomies were closed with continuous running suture with 6/0 polypropylene (Fig. 1).

No fasciotomy was performed. No major or minor complication occurred in the postoperative period and the patient was discharged, after the adequate anticoagulation, in 7th postoperative day in good condition, with distal pulses. A duplex scan exam was performed on the controlateral limb but no anatomic anomalies was observed.

Discussion

The femoral arteries may present many anomalies in their origin and course. The deep femoral artery could originate from the common femoral artery higher or lower than normal, from 1 cm up to 7-8 cm or more from the inguinal ligament. In rare cases it could arise from the external iliac artery. In these cases the common femoral artery is not really present and the external iliac artery seems to be roll down into the superficial femoral artery (3, 4). In these cases some anomalies of the deep femoral branches may be associated, in accord with Williams' classification (5), and variations in the topographic relationship with femoral nerve may be suspected to avoid intra-operative iatrogenic injury of the femoral nerve branches.

In our experience the deep and the superficial femoral arteries runned with parallel course and no common femoral artery was present. The deep femoral artery showing a complex relationship with femo-

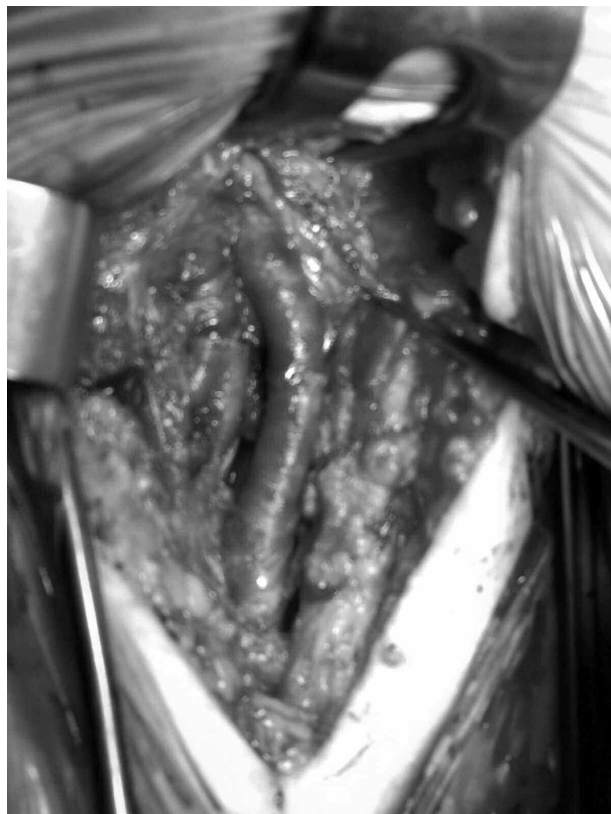


Fig. 1 - The deep and the superficial femoral arteries arises from the external iliac artery 2 cm above the inguinal ligament, and run with parallel course. The two transverse arteriotomies were closed with continuous running suture.

ral nerve branches, crossing the artery, that required a carefully dissection of the main trunk of the nerve to obtain a complete mobilization of the artery.

This unsuspected and intra operative vascular pattern can lead to a technical difficulty to achieve a safe proximal control of the iliac artery especially by the standard femoral approach. The inguinal ligament mobilization carried out by detachment to the anterior superior iliac spine or its incision seems to be not sufficient to obtain an extensive segment of the artery to perform an easy embolectomy. The exposure of external iliac artery carried out by means of an ileofemoral approach with two distinguished incision or with a single incision, with division of the inguinal ligament, may lead to major surgical and anaesthesiological impact in high risk patients.

In our experience the use of the Fogarty catheters into the deep and the superficial femoral arteries through two separate arteriotomies may guarantee to safe and optimal embolectomy of the proximal iliac artery, avoiding the problems of iliac artery control, without making others skin incisions.

It's our opinion that during the embolectomy of

the superficial or deep femoral arteries, the others artery should be clamped to reduce the risk of dislodgment of proximal thromboembolic materials during the Fogarty passage, such as in case of aortic transfemoral retrograde embolectomy.

In conclusion, it's our opinion that in similar cases,

if possible, a retrograde embolectomy of the iliac artery, performed with two separate arteriotomy on the deep and superficial femoral arteries, is to prefer respect to the surgical direct exposure of the external iliac artery, with satisfying results and lower systemic and local impact especially in high risk patients.

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