Case report - Venous

A rare anomaly of the femoral vessels: complete transposition of the femoral artery and vein

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Abstract

We report the case of complete transposition of the femoral artery and vein in a 47-year-old woman submitted to high ligation of the left saphenous femoral junction (SFJ) and great saphenous vein (GSV) stripping. During the dissection, we detected that the SFJ and the common, superficial and deep femoral veins were laterally placed to the femoral artery and the GSV crossed the femoral artery bifurcation. Associated variations of the GSV, femoral artery and vein is quite rare and, despite being asymptomatic can lead to technical difficulties increasing the risk of major intraoperative complications. The knowledge of this anomaly seems to be important and its detection is usually intraoperative.

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1. Introduction

Anatomical variations of the femoral vessels within the femoral triangle have been widely documented in the literature but few reports have described their synchronous association [1, 2]. Although these variants rarely lead to clinical manifestations, technical difficulties can take place during surgical procedures.

We report the case of complete transposition of the femoral artery and vein within the femoral triangle.

2. Case report

A 47-year-old woman was admitted to our Unit with primary symptomatic varicose veins of the left leg [clinical—etiological—anatomical—pathophysiological classification (CEAP) C4]. No medical history of deep venous thrombosis (DVT), superficial thrombophlebitis or trauma was reported. At physical examination varicosities along the great saphenous vein (GSV) and leg tributaries veins were detected. Color-coded Doppler ultrasound (US) showed an incompetent saphenous femoral junction (SFJ) and a widened GSV with reflux extended to the paramalleolar level. No change in vessels orientation was reported by the US examiner. The patient was submitted to a high ligation of the SFJ and stripping of the GSV. The SFJ was exposed through a classical small groin incision. During the dissection, we noted that the common femoral artery was medial to the common femoral vein and the SFJ and GSV crossed the femoral artery bifurcation near to the origin of the profunda femoral artery (Fig. 1). The tributaries veins were ligated and, after a safe dissection of the GSV and SFJ, a ligature of the GSV at the SFJ was performed without intraoperative complications (Fig. 2). The stripping was completed and the patient was discharged the same day.

The US performed on the contralateral groin showed a normal development of femoral artery and vein.

3. Discussion

The complete transposition of the femoral vessels associated with an anomalous development of the GSV is a rare anomaly with an incidence in the literature of 0.02% [3]. Embryologically the femoral artery becomes the main vessel to the lower limb during the 14 mm embryo stage, when the proximal segment of the axial sciatic artery persists to develop the inferior gluteal artery, while the middle portion disappears. These anatomical conditions generally do not lead to clinical manifestations, although some authors suggested the possibility that an anterior position of the common femoral artery can progress to an ‘entrapment syndrome’ on the common femoral vein contributing to DVT or secondary varices [4]. In our case, no previous history of DVT or thrombophlebitis was reported.

These anomalies could lead to a very technically and unexpected demanding operation with a high incidence of intraoperative complications.

In the experience of Leite et al., Smith and Dimitri, and Bandyopadhyay et al. three cases of an incomplete transposition of the vessels with the femoral vein, the SFJ and the GSV placed behind the artery during varicose vein surgery or in course of cadaveric dissection were documented [4–6]. A complete transposition of vessels with GSV

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that cross the superficial femoral artery near the femoral bifurcation, like our report, was similarly detected by Forty during a profundoplasty [7]. The knowledge of these anomalies seems to be mandatory to avoid any arterial or venous complications during varicose vein surgery. Indeed, according to Rudstrom et al. [8], poor confidence with anatomical anomalies, such as separate femoral entrance of the GSV below its tributaries, femoral artery and vein transposition or superficial femoral artery running in front of the saphenous junction could lead to major arterial or venous injuries [9].

No additional information regarding contralateral femoral vessel orientation in the femoral triangle were reported by the same authors in accordance with our case in which the US examination on the contralateral femoral triangle did not show any anomaly. An important issue seems to be the role of US examination in the preoperative planning. In our opinion, the US examination does not lead to easy detection of such anomalies and the US examiner rarely performs a detailed evaluation to achieve a clear identification of vascular orientation.

Therefore, although the same authors advocate an extensive use of US to achieve a preoperative diagnosis, in accordance with our case, in which the preoperative US fails to detect this vascular pattern, we maintain that it is necessary to understand how these anomalies are often misdiagnosed in the preoperative planning and how the detection is generally intraoperative. In any case, careful investigation to visualize the common, superficial and deep femoral vein by US before operation of the GSV could be useful.

Regarding the technical approach, a careful dissection of all the tributaries veins and wide circumferential GSV isolation is needed. Indeed, it is mandatory to consider that this anomaly could be associated with an anomalous development of the superficial or deep femoral vein that could be exchanged for GSV and wrongly cut. The cannulation of the premalleolar distal GSV with the stripper and the evidence of the same stripper in the proximal GSV before cutting, can be an additional trick to safe identification of the GSV. We believe that the mobilization of the artery could be useful especially in cases of incomplete transposition or anomalous origin of the deep femoral artery placed in front of the SFJ and GSV.

References


Fig. 1. Intraoperative view (left groin): the common femoral artery, isolated on the vessel loop, was medially placed to common femoral vein, SFJ and GSV (after ligation of tributaries veins). The GSV cross the bifurcation near the profunda femoral artery. SFJ, saphenous femoral junction; GSV, great saphenous vein.

Fig. 2. Intraoperative view (left groin) that shows the complete transposition of the common femoral artery and vein after ligation of the SFJ and stripping of the GSV. SFJ, saphenous femoral junction; GSV, great saphenous vein.