Negative results - Venous

The management of arterial and venous injuries during saphenous vein surgery

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Abstract

Objectives: Arterial injury of the lower limb is a rare but catastrophic complication of saphenous vein stripping with a high morbidity rate and severe medico-legal implications. Diagnosis is often delayed and outcome depends on the severity of injury. We report two cases of severe ischemia due to arterial lesion during varicose veins surgery. Methods: In the first case, a superficial femoral artery ligation after an operation for recurrent varicose veins surgery occurred; in the second case, an intraoperative ligation of the superficial femoral artery and vein was detected. In the first case, an angiography was carried out and a superficial–superficial femoral artery interposition graft with PTFE was performed. In the other case, an interposition graft with a contralateral saphenous vein between the common and superficial femoral artery and an end-to-end anastomosis of the superficial femoral vein was carried out. Results: No amputation occurred, good patency rate of the graft was achieved and no neurologic–muscle complications were revealed. Conclusions: Femoral artery injury after venous stripping shows a high amputation rate due to delayed diagnosis and severity of arterial involvement. Angiography must be reserved in any case of late ischemia. Prompt diagnosis and aggressive management is mandatory.

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Keywords: Femoral artery; Varicose veins; Vascular injuries

1. Introduction

Arterial and venous injuries following varicose veins surgery are rare but present a high morbidity rate and very important medico-legal implications. We report two cases of major vascular injuries after varicose veins surgery.

2. Case 1

A 39-year-old woman underwent a redo-crossectomy for recurrence of a varicose vein of the left lower limb by a general surgeon. Three hours after the operation an acute ischemia with paresthesia and motor impairment occurred.

An urgent femoral arteriography showed interruption of the superficial femoral artery with rehilation of the tibioperoneal trunk and the leg arteries. The deep femoral artery was visible. An emergency operation was performed. The intraoperative finding showed a ligation and division of the superficial femoral artery at the origin. After the distal thrombectomy by means of a No. 3 Fogarty catheter, a 7-mm PTFE graft interposition between the proximal and the middle superficial femoral artery was carried out. The limb was revascularized 5 h after the injury. No fasciotomy was required. The leg was salvaged and no minor amputa-

3. Case 2

A 37-year-old woman with a varicose veins underwent stripping of the right greater saphenous vein by a general surgeon. During the saphenous femoral junction dissection, a profuse bleeding due to superficial femoral vein laceration occurred and a blind hemostasis was achieved with repeated blind clamping and suture. An accurate inspection of the femoral region revealed a ligation and division of the common femoral artery and superficial femoral vein. The vascular surgeon was called.

An extensive preparation of the femoral arteries and veins was carried out showing a diffuse injury of the intimal layer due to repeated blind clamping. Distal thrombectomy of the superficial femoral artery with a No. 3 Fogarty catheter and manual squeezing of distal venous system were performed. The superficial femoral vein was repaired, after adequate mobilization, by means of an end-to-end anastomosis. An interposition graft with contralateral great saphenous vein between the common and superficial femoral artery was carried out.
The limb was revascularized 3 h after the injury. The postoperative course was normal. Post-surgical CK value was normal (145 U/l). The patient was discharged on the 12th postoperative day and an anticoagulant therapy with warfarin sodium and compression stocking was started. At one-year follow-up, by means of duplex scan examination the artery and the vein were patent. No muscle or nerve impairment or leg edema was detected.

4. Discussion

Arterial and venous complications following varicose veins surgery are rare but devastating either for morbidity and mortality or for medico-legal implications [1]. The largest observational studies reported an incidence of major arterial and venous vascular complication ranging between 0.01–0.06% [2, 3].

These complications seem to be very anecdotal, but the review performed by Rudstrom et al. showing a total of 44 cases of arterial injuries with a high amputation and morbidity rate and another of 43 cases of venous injuries containing a severe morbidity with five fatal injuries [4].

Prompt diagnosis is mandatory to achieve a good outcome, but more than 30–60% of arterial injuries present as a late diagnosis due to postsurgical pain and bandaging causing a mistake and delay in diagnosis [5].

In our opinion, despite the extensive use of duplex scan examination in vascular practice, preoperative angiography should be the preference in all cases of postoperative late examination in vascular practice, preoperative angiography mistake and delay in diagnosis but more than 30–60%.

In the first case, a blind hemostasis seems to be advocated. Some anatomical conditions can predispose to vascular injuries. Young and slim women, with little subcutaneous tissue present with a small and bluish artery mimicking the saphenous vein. Some anatomical anomalies, like separate femoral entrance of the great saphenous vein below its tributaries, femoral artery and vein transposition or superficial femoral artery running in front of the saphenous junction seem to predispose to arterial injuries [7].

After an adequate dissection of the vascular structure, a debridement of the injured segment is performed to remove any area of contusion, sub-intimal hematoma and intima fracture can predispose to postoperative thrombosis. Primary repair with end-to-end anastomosis or short interposition graft is usually performed.

The contralateral great saphenous vein is the conduit of choice but in cases of the saphenous vein not being suitable for an extensive involvement in varicose disease, the use of arm veins or especially PTFE graft seem to be good alternatives with optimal long-term results due to good run-off and short length of reconstruction, generally in above the knee position.

In this case of venous repair, an end-to-end anastomosis was carried out. In our opinion the repair without interposition graft is the best solution, avoiding postoperative risk of early thrombosis due to synthetic material and problems due to inadequate mismatch size between the saphenous vein and the common femoral vein.

Although the stripping of the arterial system seems to be difficult to understand, in contrast with the deep venous system, some experiences in the literature report this complication with an amputation rate of 42% and morbidity rate of 85% [4, 8–10].

Generally a femoral-to-anterior tibial artery bypass graft is carried out because this vessel is never damaged by the stripper. A single artery revascularization is sufficient for good long-term results.

5. Conclusions

A complete knowledge of the anatomy with their anomalies and adequate anatomical surgical technique are mandatory, especially for young surgeons who start their surgical experience. A high level of suspicion and a scrupulous attitude may further reduce such risk.

A prompt diagnosis appears essential to achieve a high patency rate and viability of the limb, avoiding muscle contraction and nerve palsy in young patients.

In our opinion, this surgery should be considered as a real part of vascular surgery and it should be performed by a trained vascular surgeon.

References


EComment: Iatrogenic venous injuries (IVIs)

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The article by Marcucci et al. [1] reports two rare cases of major iatrogenic venous injuries (IVIs) following varicose vein vascular surgery. My search of our database (last eight years), shows that the incidence of IVIs especially after varicose vein surgery is increasing. This increase seems to be associated with the introduction of fairly sophisticated techniques such as radiofrequency and lasers combined with simple crossectomy with/without phlebectomy, and performed in one-day-surgery clinics by teams consisting of young general surgeons and radiologists. The average number of civil venous
vascular injuries was 12 per year from 2000–2007, but increased from 7 in 2000 to 18 in 2007. All injuries occurred out of our clinic. The proportion caused by IVIs increased, from 33% during the 4-year-period 2000–2003 to 50% 2004–2007. While the number of registered procedures per year in the database was stable during this eight-year period, the proportion of procedures for IVIs also increased. Emergency repair was performed in 100% of the IVIs. The most common surgical procedure was direct suture repair of the vessel (49%), followed by bypass or interposition graft (29%), and end-to-end anastomosis (22%). For IVIs, injuries in the groin predominated. We assume this is likely due to the great number of therapeutic procedures performed by inexperienced teams consisting of young general surgeons and interventional radiologists who performed surgical procedures in one-day private clinics. Numerous ethical considerations emerging from recent tendencies in managing for varicose vein disease must be taken into account, such as the ethical aspects of sending a patient of one’s own to another specialist for specific problems such as varicose vein diseases, for instance to a dermatologist, radiologist, or for surgery, for instance to a colleague with more experience in that particular kind of case.

I would like to congratulate the authors for a fantastic description of two cases which absolutely support the conclusion that adequate surgical technique is mandatory for ablative surgery or endovascular obliteration for varicose vein disease and it should be performed by a trained vascular surgeon, in order to minimize unpredictable postoperative complications.

References