Giant thrombosed saphenofemoral junction aneurysm: A case report

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Abstract
Introduction: Although saphenofemoral junction aneurysms are not so rare, only scarce of the published cases reported thrombosis of the aneurysmal sac and saphenous trunk.
Presentation of case: A 65-year-old male with varicose disease, developed acute ascending superficial vein thrombosis of the left greater saphenous vein, involving the 6-cm saphenofemoral junction aneurysm. The patient underwent common femoral vein thrombectomy, aneurysm removal, and greater saphenous vein excision with uneventful postoperative course.
Conclusion: Thrombosed giant saphenofemoral junction aneurysms require emergent surgical intervention aimed at preventing potential progression to deep vein thrombosis and pulmonary embolism.

Keywords
Venous aneurysm, superficial vein thrombosis, surgery

Introduction
Saphenofemoral junction (SFJ) aneurysms are underreported, although not rare. There is scarcity of published cases, and even less cases associated with superficial vein thrombosis (SVT). Altogether, superficial vein aneurysms are approximately 60 published cases, with an incidence of 0.1% and prevalence of 1.5%.1 Pascarella et al.2 showed that superficial venous aneurysms were detected in 43 of 366 patients during duplex scan, explaining their result due to insufficient ultrasound examination in patients with asymptomatic course. Physiopathology is related to reflux and venous hypertension, inflammatory processes, infections, trauma, congenital weakness of the venous wall and localized degenerative changes.3 The most common complications include deep venous thrombosis, thrombophlebitis and recurrent pulmonary embolism. Despite progress of endovenous ablation, surgical treatment remains the only choice for most of the patients with symptomatic SFJ aneurysms, due to size and location.4

Case presentation
A 65-year-old male was inter-hospital transferred to the vascular surgery service due to sudden onset of pain, tenderness and loss of elasticity in the femoral mass and hyperemia over the thigh greater saphenous vein (GSV). Although the non-pulsatile, soft femoral mass was present for a year, the patient was not investigated because of asymptomatic course and his lack of intention to reach a consultation. Physical exam was unremarkable except local status, where a 6-cm globular, partially-compressible, painful lump was determined under the left inguinal ligament (Figure 1(a) and (b)). The mass was non-adherent, constant in upright and supine position, with some cyanosis over the median-inferior aspect. Hyperemia and tenderness over the GSV varicosities in the medium and lower third of thigh was noticed. The blood analyses were unremarkable. Doppler duplex scan showed occlusive thrombotic masses in the thigh and upper third of calf segments of GSV, with a fixed apex extending 5 mm into the common femoral vein (CFV). Near the SFJ was visualized a 6-cm eccentric fusiform dilation of GSV, completely occluded with thrombotic masses. The diagnosis of left lower limb ascending SVT, stage III, according to Verrel’s classification5 and giant thrombosed SFJ aneurysm type IA (Bush’s classification)6 was established. The patient was set on low molecular weight heparin (LMWH) and brought into the operating room, where a left CFV
thrombectomy, SFJ thrombosed aneurysm removal and GSV excision were performed.

Under spinal anesthesia, a 3.5-cm longitudinal incision over the left inguinal crease was made and the external iliac vein controlled with a rubber loop. The incision was extended downward to thigh, slightly medial to the aneurysm with its cautious mobilization and ligation of all SFJ tributaries. GSV was set on rubber band distal to the aneurysm (Figure 2(a)). The CFV was dissected down to its bifurcation and controlled with a rubber band proximal to deep femoral vein. Transversal venotomy on GSV at 8 mm distal from SFJ has been done, with direct thrombus removal from CFV lumen, isotonic saline lavage and full content aspiration from the rubber-isolated venous segment. A Satinsky clamp was tangential applied over CFV and saphenous stump, partially preserving axial venous outflow, and a sparing-edge resection with lateral venorrhaphy has been performed. The CFV incision was closed with 5–0 Polypropylene running suture (PROLENE®, Ethicon). Afterward, the rubber bands were released and the aneurysm was fully excised (Figure 2(b)).

A total saphenectomy by means of separate incisions on thigh and ankle was performed, the so-called Narath procedure, due to the tortuous path of the thrombosed GSV. The operation lasted 125 min, with an estimated 150 mL intraoperative blood loss.

The patient was transferred back to the ward and kept under direct anticoagulation. The postoperative course was uneventful, and he was discharged on the sixth postoperative day. The 1 and 3 months’ follow-up went uneventful, with full functional recovery and satisfaction.

**Discussion**

In regards to size of venous dilation, there are no precise criteria to be considered as venous aneurysm; however, $3 \times$ the size of the normal vein, or $2 \times$ the size of the contiguous vein, is considered venous aneurysm (normal SFJ size is 3–5 mm, the thigh GSV is 2–4 mm and the ankle GSV is 1–3 mm). In the presented case, our patient had a 60 mm diameter near SFJ, that 10 times exceeded the normal limits.

The reported SFJ aneurysm probably developed secondary to chronic venous hypertension, consistent with medial hypertrophy.

**Figure 1.** Preoperative view of thrombosed saphenofemoral junction (SFJ) aneurysm: (a) supine and (b) upright.

**Figure 2.** Intraoperative view of saphenofemoral junction (SFJ) aneurysm: (a) rubber band control of common femoral vein (CFV), external iliac vein (EIV) and greater saphenous vein (GSV). (b) Resected 6-cm aneurysm specimen, with clot inside. (c) Microscopic view: intimal thickening/medial hypertrophy.
and intimal thickening identified on histopathological specimen (Figure 2(c)). A recent study established an increased expression of metalloproteinase in the wall of a venous aneurysm, with their simultaneous decrease in the muscle layer, also increased fibrous tissue and inflammatory cells infiltration.1

Pascarella et al.2 classified aneurysms of the saphenous systems into four types. Type I aneurysms (52%) are located in the proximal third of the saphenous vein, but not at SFJ. Type II of aneurysms (35%) are in the distal third of thigh. Type III of superficial saphenous vein aneurysms (7%) is a combination of type I and type II in the same lower limb. Aneurysms in the small saphenous vein (SSV) were classified as type IV (6%). Bush and Bush6 further subdivided those types, that is, SFJ aneurysms are type IA (involving junctional branches) and dilations distal to preterminal valve being type IB. The SFJ aneurysm additionally highlight a classification issue, the junctional location questions which venous system should they be referred to. Our experience supports usefulness of considering SFJ aneurysms as separate entities, due to higher emboligenic potential (in case of thrombosis) that suggest a distinct management—need for urgent surgery.

Acute ascending varicose axial SVT was classified by Verrel et al.1 into four progressive stages, with a respective adapted treatment. Varicophlebitis without involvement of preterminal valve or deep veins was defined as stage I, while reach of the GSV and/or SSV’s preterminal valve by the apex of the thrombus is already stage II and thrombus entering deep veins via preterminal valve is stage III. Extending thrombus via incompetent perforating veins into the deep system is stage IV. Thus, stage I and IV should be treated conservatively first, with saphenectomy after symptom regression, comparing to stage II and III—that should be urgently operated—crossectomy, excision of saphenous vein without stripping including various tributaries, ligation of the incompetent perforators.

Accordingly, our case was a stage III (Verrel) SVT, type IA (Bush) SFJ aneurysm, that had to be managed urgently. SFJ aneurysms, due to proximity with the deep system, especially in acute cases, have a high risk for massive pulmonary embolism with fatal course. Therefore, gentle exploration and/or use of cava filters should be considered.

The treatment of aneurysms of the saphenous systems can be either conservative or surgical. Small-sized, asymptomatic venous aneurysms may be treated via compression therapy with prophylaxis of thrombophlebitis and deep vein thrombosis. Indications for open surgery serve: presence of symptoms, elevated risk of thrombosis, compression of adjacent structures, bleeding caused by rupture and aesthetic issues. Conventional surgical treatment consists of ligation and total excision of aneurysm, because there is no need to re-establish continuity of the superficial venous system, as opposed to deep venous aneurysms, where tangential excision + venorrhaphy is the definitive treatment. Endovascular techniques practiced for deep vein aneurysms, such as endovenous stent-assisted coil embolization or exclusion with a self-expanding covered stent, are usually not feasible in SFJ location.4,7 There is also a poorly defined mechanics of stent endothelization is in the venous system.7 In our case, total excision of the aneurysm and CFV thrombectomy resolved symptoms and prevented pulmonary thromboembolism.

**Conclusion**

Thrombosed giant SFJ aneurysms require emergent surgical intervention aimed for prevention of potential progression to deep vein thrombosis and pulmonary embolism.

**Declaration of conflicting interests**

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**Ethical approval**

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**Informed consent**

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**Statement of underlying material access**

The underlying research material may be accessed via a request to the editor, authors.

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