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## Great saphenous vein aneurysm: A differential diagnosis of femoral hernia and review



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## ABSTRACT

**INTRODUCTION:** Venous aneurysms are unusual clinical entities that might be difficult to diagnose and usually appear as an asymptomatic incidental finding on physical examination or imaging study and discovered only during the surgical exploration. They are important differential diagnosis of groin and other subcutaneous mass.

**PRESENTATION OF CASE:** We report a case of a 67-years-old woman who had a groin mass misdiagnosed as femoral hernia, which was subsequently diagnose as great saphena vein aneurysm in the intraoperative set and treated with ligature and resection.

**DISCUSSION:** In conclusion, venous aneurysms of the superficial system are lesions that are important differential diagnosis of groin and other subcutaneous mass.

**CONCLUSION:** Diagnosis is readily available by duplex ultrasonography; however, in most cases, the diagnosis is done only in the operative field.

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## 1. Introduction

An aneurysm is a focal dilatation of a blood vessel. It usually occurs in arteries, however they may occur in any part of the vascular system. Venous aneurysms are unusual clinical entities that have been described throughout the venous system [1]. It is best described as a solitary area of venous dilatation that communicates with a main venous structure by a single channel, and it must have no association with an arteriovenous communication or a pseudoaneurysm. Most importantly, it should not be contained within a segment of varicose vein [2]. They may occur in the presence or absence of varicose veins [2,3]. Venous aneurysms are lesions that might be difficult to diagnose [4]. They have been reported to occur in most major neck, central thoracic and extremities veins.

Primary venous aneurysms are infrequently noted and usually appear as an asymptomatic incidental finding on physical examination or imaging study and rarely have clinical significance with the notable exception of aneurysms of the popliteal vein, which have been recognized as a rare source of recurrent pulmonary embolism and deep venous thrombosis. These lesions may be misdiagnosed as soft tissue masses or as inguinal or femoral hernias [5].

Treatments for these lesions range from simple observation to surgical resection and end-to-end anastomosis [4,5].

We report a case of a woman who was admitted to our hospital to treat a groin mass misdiagnosed as femoral hernia, which was subsequently diagnose as great saphena vein aneurysm in the intraoperative set and review import aspects about the venous aneurysms and the treatment options. We stressed important elements of this case, such fully documented surgery, histological and clinical aspects, rarity and review of very important aspects of this entity.

## 2. Presentation of case

A sixty-seven years old female was admitted in our infirmary (abdominal wall diseases) with complaints of a growing mass at the groin region during the last two years. The mass increased during efforts and returned to normal size in rest. The patient also referred local pain and ipsilateral paresthesia. She was diagnosed with hypertension twelve years ago and was taking enalapril and amlodipine as medical treatment. As previous surgery, she referred a cholecystectomy for gallstones disease and two cesarean labors. There was no history of trauma, infection or inflammatory disease. At physical examination, a obesity was noted (Index Body Mass = 29.5 Kg/m<sup>2</sup>). The inguinal region examination revealed an easily reducible bulging with soft consistency (Fig. 1). The bulging

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Fig. 1. - Valsalva maneuver into the right femoral region.

increased during Valsalva maneuver. There were also varicose veins in the lower extremities with stasis dermatitis.

Surgical therapy was indicated with a preoperative diagnosis of femoral hernia. During surgical exploration, with local anesthesia (lidocaine 1% solution), a 4 cm incision was carried out at saphenofemoral junction; a venous dilatation of saphena crocea was noted (Fig. 2). It was optioned to resect the aneurysm and ligate that distal part of the great saphena vein, as well as the proximal part close to the femoral vein (Fig. 3). The postoperative period were uneventful and the patient was discharged at first post-operative day. Histopathological examination revealed focal intimal and media layer thickening with fibroplasia areas (Figs. 4 and 5).



Fig. 3. - Great saphenous vein aneurysm close to right femoral vein.

### 3. Discussion

Venous aneurysms are unusual vascular malformations that occur equally between the sexes and are seen at any age. Superficial venous aneurysms of the inguinal region are often misdiagnosed [2] and discovered only during the surgical exploration. This type of venous aneurysms have commanded little attention chiefly because they carry no threat to life or limb and have not been noticed to any great extent until recently [6].

The differential diagnosis of a soft-tissue mass of an extremity on which the general surgeon may be asked to operate includes a wide spectrum of benign and malignant lesions [7]. Venous aneurysms

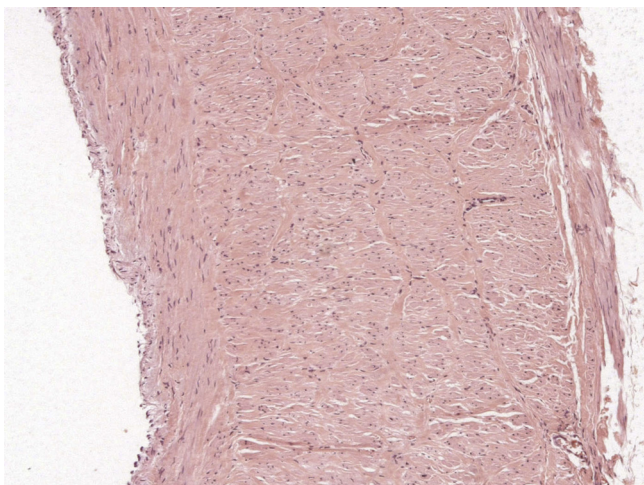


Fig. 2. - Intraoperative aspect after opening the skin.



Fig. 4. - Macroscopic aspect of the great saphenous vein aneurysm.





**Fig. 5.** – Microscopic aspect of the great saphenous vein aneurysm with focal intimal and media layer thickening and fibroplasia areas.

are uncommon in clinical practice but should be included in the differential diagnosis of a subcutaneous mass or of inguinal or femoral hernias [8].

Previous reviews have documented lesions in diverse sites including the superior vena cava jugular, popliteal, great saphenous, axillary, facial, portal, splenic, femoral, and intracranial veins [2]. The most common location is in the lower extremities, and the most frequent vessel is the popliteal vein. Saphena vein aneurysm is the second most common affected vessel [9,10]. A wide variety of clinical presentations of venous aneurysms is reported in the literature [7]. In most cases of peripheral venous aneurysms, they are responsible for no more than local discomfort, pain and tenderness [2], which means they are usually asymptomatic and the diagnosis is one of exclusion. Saphenous venous aneurysms usually occur as soft, painless masses in the thigh or calf [8]; is also quite common the association with varicose veins (as occurred in our case). Many are misdiagnosed as soft tissue masses of the lower extremities or as inguinal or femoral hernias, as also occurred in the present case (Table 1).

The cause of venous aneurysms remains unknown, although several theories have been proposed. Lev and Saphir characterized the structural changes that occurred with age and concluded that there are two changes that can lead to aneurysm formation: endophlebohypertrophy [8] (progressive intimal proliferation of elastic, muscle, and connective tissue), which occurs as a normal response to mechanical stress; and endophleboscclerosis (a degenerative pathologic process characterized by alterations in ground substance, disruption and loss of elastic fibers, loss of medial muscle cells, and fibrosis) [11]. This results from the pressure exerted by the adjacent arterial wall and the flow disturbance produced by continuous pulsations.

Another theory claims that complete absence of medial smooth muscle is clearly congenital [11]. This has been associated with decreased amounts of smooth muscle cells and elastin fibers, fibrous connective tissue and elastic fibers in the vein wall [12].

**Table 1**  
Possible diagnosis of inguinal tumors.

| Differential diagnosis of groin mass |
|--------------------------------------|
| Inguinal hernia                      |
| Femoral Hernia                       |
| Soft tissue tumor                    |
| Nodal enlargement                    |
| Superficial saphena vein aneurysm    |

It is likely that a combination of congenital and acquired mechanisms are involved [11]. Gillespie et al. noted a reduction in the number and size of muscle and elastic fiber and intimal hyalinization in 4 cases of subcutaneous venous aneurysm [2]. They also described histologic changes in the adjacent nonaneurysmal portions of these veins consisting of intimal hyperplasia, alterations in elastic fiber content, and ground substance with medial hypertrophy [11]. A significant diminution in the number and size of muscle and elastic fibers in the walls of these aneurysms is a common finding. Fragmentations of the internal elastic lamella and replacement by fibrous connective tissue have been noted. These findings help to distinguish a venous aneurysm from a varicose vein. In varicose veins, fibrous tissue is increased; in particular the muscle layers and the vessel wall are thickened, and tissue fibrinolytic activity is reduced in the varicose vein [13]. Venous aneurysm occurs as a single lesion regardless of sex, age, and site in the body.

There as a classification proposed by Pascarella et al. [6] that divide the great saphena vein aneurysms in four types: Type I (52%) is located at the proximal third of the saphena vein, but not at saphenofemoral junction. Type II aneurysms were located in the shaft of the saphenous vein in the distal third of the thigh (35%). The third classification (type III) of superficial saphenous vein aneurysms was an occurrence of types I and II in the same lower extremity (7%). Superficial venous aneurysms of the short saphenous system are classified as type IV (6%). According to this author, superficial venous aneurysms are found in association with saphenous vein reflux in both men and women [6].

Because of the small number of cases reported by most individual series [4,14], no single diagnostic method has been reported to be superior to another [2]. Most venous aneurysm are diagnosed only in the operative field, although they are located in the superficial venous system, are palpable and easily compressed. In earlier reports, venography was suggested as the imaging technique of choice [11]. Venous duplex imaging recently became the noninvasive test of choice for the diagnosis of deep vein thrombosis and venous aneurysm [3]. Present ultrasound technology provides images that accurately define the anatomy and pathologic condition of the infrainguinal venous system [11]. Besides all current image technology, we must not forget that the diagnostic confirmation is histopathologic.

There are several reasons to recommend surgical treatment of most venous aneurysms [2,12]. The most common complications of venous aneurysms are thrombus formation, severe recurrent pulmonary embolism, spontaneous rupture, and thrombophlebitis, but all of them are quite rare [2]. Rupture, the most expected complication in arterial aneurysms, has not been reported in peripheral or venous aneurysms of the superficial extremity, but pain, swelling, or undefined mass are common indications for surgery. Thromboembolic complications are common in aneurysms involving the deep system [15], however they are very rare in superficial venous aneurysms and therefore not a important reason to indicate surgical treatment.

The operative repair is a uniformly successful form of therapy, but satisfactory venous function in the limbs should not be forgotten. Major deep vein occlusion may predispose to venous outflow impedance, venous hypertension, and venous ulceration [12].

Several operative techniques have been used in venous aneurysm of the extremities: ligation and simple excision; excision and vein patching; excision with interposition vein or prosthetic grafting; tangential excision with lateral venorrhaphy; autologous vein patch; and complete resection. Due to the low number of cases, it is difficult to establish treatment guidelines on the basis of the experience of one institution. The method of treatment is usually dictated by the anatomical location. In deep vein aneurysms it is preferred to use excision (either tangential or conventional) with reconstruction (either with prostheses or autologous graft). In the

superficial system, there is usually no need to reconstruct the vessel [8]. Aneurysm resection with venorrhaphy has been associated with subsequent early occlusion and would therefore seem to have little to offer over simple ligation. In the present case, it was performed ligation and aneurysm resection.

#### 4. Conclusion

In conclusion, venous aneurysms of the superficial system are lesions that usually appear as an asymptomatic incidental finding and rarely have clinical significance. They are important differential diagnosis of groin and other subcutaneous mass. Diagnosis is readily available by duplex ultrasonography; however, in most cases, the diagnosis is done only in the operative field. The treatment depends on the location, but superficial vein aneurysms may be managed with simple excision and ligation of the feeding vessel.

#### Conflicts of interest

The authors declare that they have no conflict of interest.

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#### Consent

The authors confirmed that informed consent was obtained from the patient including accompanying images.

#### Authors' contribution

Jocielle Santos de Miranda – writing, operative field, submission. Sergio H.B. Damous – operative field, data collections. Mario

Faro Paulo Junior – data analysis, writing. Jin H. Yoo – study design, review. Eduardo T. Yassushi – data analysis, review. Abel H. Murakami – pathologic pictures, review. Adriano Zuardi – writing, pictures. Cláudio Birolini – writing, review, data analysis. Edivado M. Utiyama – study design, review.

#### References

- [1] J.R. French, N.J. Moncrieff, R. Englund, K.C. Hanel, Thrombotic complications of venous aneurysms, *ANZ J. Surg.* 73 (6) (2003) 384–386.
- [2] D.L. Gillespie, J.L. Villavicencio, C. Gallagher, A. Chang, J.K. Hamelink, L.A. Fiala, et al., Presentation and management of venous aneurysms, *J. Vasc. Surg.* 26 (5) (1997) 845–852.
- [3] H. Ekim, T. Gelen, G. Karpuzoglu, Multiple aneurysms of the cephalic vein. A case report, *Angiology* 46 (3) (1995) 265–267.
- [4] G.A. Ranero-Juarez, R.H. Sanchez-Gomez, S.E. Loza-Jalil, A.M. Cano-Valdez, Venous aneurysms of the extremities. Report of 4 cases and review of literature, *Angiology* 56 (4) (2005) 475–481.
- [5] E. Simsek, O. Bugra, Great saphenous vein aneurysm presenting as an inguinal hernia, *Asian J. Surg./Asian Surg. Assoc.* 37 (4) (2014) 208–210.
- [6] L. Pascarella, M. Al-Tuwaijri, J.J. Bergan, L.M. Mekenas, Lower extremity superficial venous aneurysms, *Ann. Vasc. Surg.* 19 (1) (2005) 69–73.
- [7] B.A. Perler, Venous aneurysm. An unusual upper-extremity mass, *Arch. Surg.* 125 (1) (1990) 124.
- [8] S.G. Friedman, K.V. Krishnasastri, W. Doscher, S.L. Deckoff, Primary venous aneurysms, *Surgery* 108 (1) (1990) 92–95.
- [9] J.J. Gallagher, J.H. Hageman, Popliteal vein aneurysm causing pulmonary embolus, *Arch. Surg.* 120 (10) (1985) 1173–1175.
- [10] H.P. Gruber, M.A. Amiri, G. Fraedrich, V. Schlosser, Multiple venous aneurysms of the saphenous vein: report of an uncommon case, *Vasc. Endovasc. Surg.* 25 (2) (1991) 142–145.
- [11] S.C. Aldridge, A.J. Comerota, M.L. Katz, J.H. Wolk, B.I. Goldman, J.V. White, Popliteal venous aneurysm: report of two cases and review of the world literature, *J. Vasc. Surg.* 18 (4) (1993) 708–715.
- [12] K. Dawson, G. Hamilton, Primary popliteal venous aneurysm with recurrent pulmonary emboli, *J. Vasc. Surg.* 14 (3) (1991) 437.
- [13] K.D. Calligaro, S. Ahmad, R. Dandora, M.J. Dougherty, R.P. Savarese, K.J. Doerr, et al., Venous aneurysms: surgical indications and review of the literature, *Surgery* 117 (1) (1995) 1–6.
- [14] O.C. Dourado, A.G. de Miranda, A. Pinheiro Filho, L.O. Dourado, Aneurisma venoso no pé: relato de casos e revisão da literatura, *J. Vasc. Bras.* 5 (2006) 313–316.
- [15] R.L. Hurwitz, H. Gelabert, Thrombosed iliac venous aneurysm: a rare cause of left lower extremity venous obstruction, *J. Vasc. Surg.* 9 (6) (1989) 822–824.

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