

Posterior Tibial Vein Aneurysm: Case Report

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Introduction

Venous Aneurysm (VA) is a focal dilatation that communicates with a normal venous segment through a single channel, non-related to a varicose segment, pseudoaneurysm or arteriovenous¹ fistula. Most venous aneurysms are congenital, although they may also be acquired by trauma or inflammation². Single venous aneurysms are rare and usually appear as incidental findings on physical tests or imaging studies, yet little reported in the medical literature. However, they may be remembered as a rare cause of Pulmonary Embolism (PE) and Deep Vein Thrombosis (DVT)³. Primary aneurysm of the posterior tibial vein is an extremely rare clinical entity. Only four cases have been described in the literature, all related to complications^{1,4-6}. The objective of this study is to report a case of asymptomatic posterior tibial vein aneurysm with a conservative approach.

Case report

Male patient, 29 years old, referred to elective vascular ultrasound service for preoperative venous mapping of the lower limbs for varicose vein surgery. The patient complained of chronic pain and burning legs. No history of previous vascular procedures, trauma or venous thromboembolism. Physical test revealed the presence of bilateral superficial varicose veins without signs of edema and associated trophic changes.

Venous color Doppler showed superficial varicose veins bilaterally, associated with ostial insufficiency of left great saphenous vein. The study of the deep venous system showed fusiform aneurysmal dilatation of the left posterior tibial vein in distal third, with diameters of 1.3 cm x 1.4 cm (transverse and anteroposterior, respectively), with no evidence of any thrombotic process associated (Figures 1A, 1B, 2A and 2B). The patient was referred for clinical control with an assistant angiologist, who opted for a conservative treatment of the venous aneurysm. The

Keywords

Aneurysm; Arteriovenous Fistula; Varicose Veins; Ultrasonography, Doppler.

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patient underwent left great saphenous vein stripping, and remained asymptomatic after six months of follow-up.

Discussion

We present the case of posterior tibial vein aneurysm in a patient with primary varicose veins in the lower limbs. The first case described is not related to complications.

The first known description of a VA as a clinical entity was made by Osler in 1913, during necropsy studies⁷. The first asymptomatic VA was described by Dahl et al. in 1976 in a patient with popliteal vein aneurysm associated with thromboembolism⁸. In 1996, Otto et al.⁸ reported a case of Posterior Tibial Vein Aneurysm (PTVA). That was considered the first case of this type recorded in the literature⁹. Recent publications by Gabrielli⁴ (2010), Haggani⁵ (2013), T Stein¹ (2013) et al. describe reports of single cases of symptomatic PTVA as the cause of thromboembolic events with their clinical and surgical developments^{1,4,5}.

Venous aneurysms can be classified into two types: deep and superficial venous system aneurysm. Due to structural changes, AV is presented in two ways: fusiform or saccular. This differentiation is important to determine the surgical strategy in certain cases¹⁰.

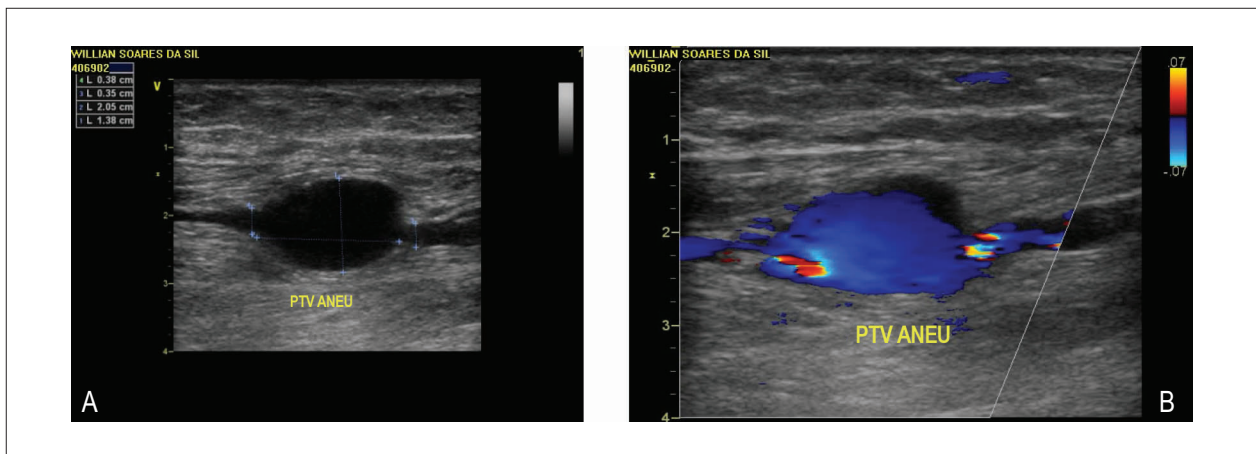
Unlike the arterial system, venous system aneurysms are rare and occur at any age, regardless of sex. The incidence of the superficial venous system aneurysms is described as around 0.1%, while the prevalence is up to 1.5%. Popliteal VA is the most frequent ones in the lower limbs, followed by aneurysms in the great saphenous vein^{2,10}.

Data from the literature describe the incidence of VA with concomitant PE in 24% - 32%, and chronic venous disease associated with VA around 76%. A superficial VA can be occasionally associated with thromboembolic phenomena, but its actual estimate is still unknown⁴. There is no agreement in the literature about the most frequent location of venous aneurysms. There are conflicting data concerning the higher incidence of VA in the upper or lower extremities⁷.

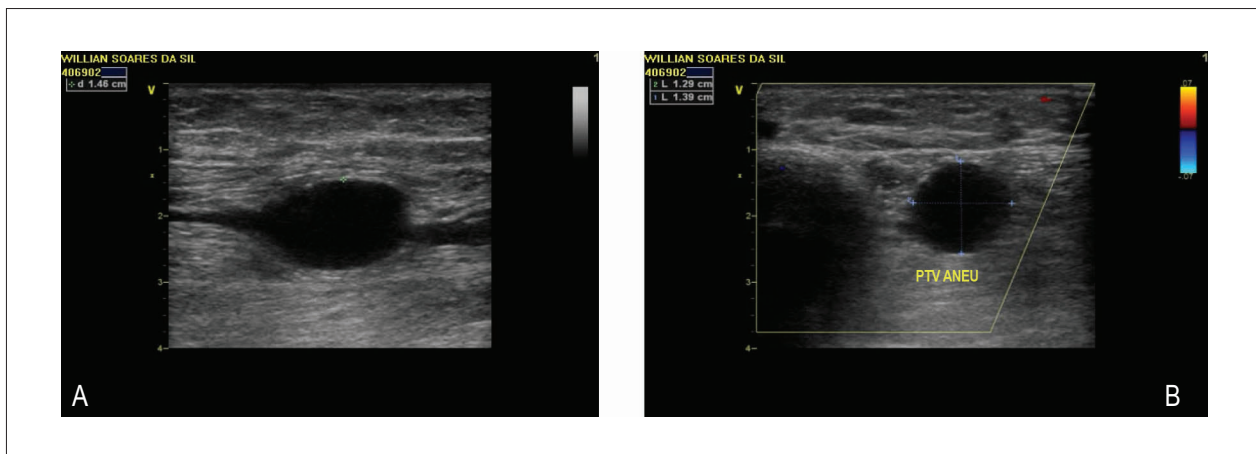
The location in the deep venous system appears to be more often associated with thromboembolism and worse morbidity than in the superficial venous system. In the upper extremities, VA are generally asymptomatic and frequently treated for aesthetic reasons, while in the lower extremities it may be associated with thromboembolism, where surgical approach may be recommended. The natural history of other VA is still poorly defined⁷.

Popliteal VA is the most frequent ones in the lower limbs, followed by the great saphenous vein aneurysms and venous aneurysms of the foot. The occurrence of the

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Figures 1A and 1B - Venous color Doppler showing PTVA with diameters (A) and internal flow (B).



Figures 2A and 2B - PTVA in longitudinal section (A) revealing a fusiform aspect without internal thrombi. Cross section (B) close to the medial and distal region of the left tibia.

latter is not very usual in the posterior tibial veins. VA in the upper limbs is usually associated with arteriovenous fistula for hemodialysis⁷. There is still no known description in the medical literature on epidemiological data on the prevalence and incidence specifically on PTVA.

The pathogenesis of VA is not well known, and several mechanisms are proposed, ranging from venous reflux and hypertension, inflammation, infection, congenital weakness of the venous wall, mechanical trauma, hemodynamic changes to localized degenerative changes. The most accepted theory today consists in the components of the connective tissue that determine focal changes in the vein wall. This could be due to a congenital underdevelopment or degenerative loss of connective tissue with age. The result would be wall weakness, increasing the risk of dilation. Endophlebohertrophy and endophleboesclerosis are the main histological characteristics of these processes and may be related to increased expression of certain extracellular matrix metalloproteinases.

A mass in the soft tissues of the limb with change in the size or in the Valsalva maneuver, with or without local phlogistic symptoms, may suggest a venous aneurysm in the lower extremity, but such clinical change is rare and is incidentally found on physical tests.

Diagnosis is usually made by non-invasive imaging, such as venous color Doppler, the method of choice to evaluate venous aneurysms of the extremities and can define their size and morphology, as well as the presence, size and extent of thrombi. Less often, it can be associated with computed tomography, magnetic resonance imaging or venography or, when necessary, complementary workup for a more detailed surgery approach².

The most common complications of VA, including the posterior tibial vein, are DVT and recurrent PE. Some authors report that major VA, just like the saccular VA, is more prone to thromboembolic complications, although there is no clear evidence on the critical diameter or the aneurysm shape that can cause further complications. PE is the most frequent

and fearsome initial presentation of VA. Some studies have shown that anticoagulant therapy may be ineffective in preventing PE, then surgical correction is recommended for all symptomatic patients with deep vein aneurysms^{1,2}.

Surgical repair is preferred in most patients with symptoms of pain, severe edema or thromboembolism. Tangential aneurysmectomy with lateral venorrhaphy is the most commonly used surgical method and has been recommended for intravenous saccular aneurysms, but may also be performed in fusiform aneurysms. In selected patients, grafts can be placed, especially when there are larger vein aneurysms, such as in the popliteal or femoral artery. After surgical repair, anticoagulation for three months may be recommended, as well as external pneumatic compression to increase venous return speed and reduce the risk of thrombosis. Superficial and deep asymptomatic VA can be monitored by vascular ultrasound, maintaining clinical surveillance of thromboembolic events^{2,10}.

Conclusion

PTVA is a rare occurrence, and may be asymptomatic and occasionally found on imaging studies or related to thromboembolic complications. Asymptomatic aneurysms may be accompanied by imaging methods, preferably vascular

ultrasound. Surgical intervention with appropriate techniques may be indicated for PTVA presenting symptoms or associated complications, mainly recurrence of PE.

Authors' contribution

Research creation and design: Taveira TS, Barros MVL. Data acquisition: Taveira TS, Azevedo ACCA, Cristino MAB. Analysis and interpretation of data: Taveira TS, Barros MVL, Cristino MAB, Azevedo ACCA. Manuscript drafting: Taveira TS, Barros MVL. Critical revision of the manuscript as for important intellectual content: Taveira TS, Barros MVL, Cristino, MAB.

Potential Conflicts of Interest

We declare there is no relevant conflict of interest.

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Academic Association

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