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Popliteal vein aneurysm - A silent condition with possible serious consequences

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Abstract

Venous aneurysms constitute rare lesions that may occur in any vein, although they are more frequent in the veins of the extremities, particularly the popliteal vein.

Despite being typically asymptomatic, they may occasionally present with pain or a swelling in the popliteal fossa, as in the case presented.

We report a case of a woman presenting with left leg pain. Doppler ultrasonography revealed a popliteal vein saccular aneurysm measuring 21 mm. For better anatomical characterization, a CT angiography confirmed the presence of the venous aneurysm and surgical intervention was proposed. The patient underwent tangential aneurysmectomy with lateral venorrhaphy without complications. She was discharged on the first postoperative day under anticoagulation.

This case highlights an uncommon condition, typically unnoticed as it is asymptomatic in the majority of cases, yet potentially associated with serious consequences. In fact, popliteal vein aneurysms are associated with an elevated risk of deep vein thrombosis and pulmonary embolism and surgical treatment should therefore be considered.

Keywords: Venous aneurysm; Popliteal vein; Deep vein thrombosis; Pulmonary embolism; Lateral venorrhaphy.

Abbreviations: CT: Computed Tomography; MRI: Magnetic Resonance Imaging.

Introduction

Venous aneurysms, defined as abnormal localized venous dilatations of two to three times the size of a normal vein, are rare lesions. The pathophysiologic mechanism is not clearly understood; however,

they can be classified as primary or secondary to trauma, arteriovenous malformation, fistula formation or connective tissue disorders [1]. They most frequently present as saccular malformations and can occur in any vein, with the most common locations being jugular veins, central thoracic veins, visceral veins and veins of the extremities.

Due to their infrequency, the management of venous aneurysms is not well established. Typically, they are asymptomatic and remain clinically stable in most cases. However, there are some exceptions, namely visceral aneurysms that have a high risk of rupture and inferior extremities aneurysms that are associated with an elevated risk of deep vein thrombosis and pulmonary thromboembolism, so they require surgical intervention [2,3].

Herein, we report a case of a popliteal vein aneurysm that was diagnosed owing to its symptoms and a review of the diagnostic and therapeutic approach of this entity.

Case Presentation

A 59-year-old woman with a past medical history of smoking was referred to the Vascular Surgery Consultation due to a left leg pain in the popliteal fossa. Doppler ultrasonography demonstrated findings of a popliteal vein saccular aneurysm measuring 21 mm, with no evidence of thrombosis.

For further evaluation CT angiography was performed. It confirmed the presence of a saccular dilatation of the popliteal vein with a maximum calibre of 22 mm and a cranio-caudal extension of 25 mm (Figure 1). Due to this finding, surgical treatment was recommended.

Surgical repair was performed with the patient in a prone position. A “lazy S” incision was made in the left popliteal fossa and subcutaneous flaps were raised. After a meticulous dissection, the popliteal vein aneurysm was identified and exposed, with careful preservation of the popliteal artery and tibial nerve. A saccular aneurysm measuring 2×2.5 cm was identified and a tangential aneurysmectomy with a lateral venorrhaphy was done under anticoagulation coverage (Figure 2). The postoperative period was uneventful and the patient was discharged on the first postoperative day under anticoagulation along with compression stockings.

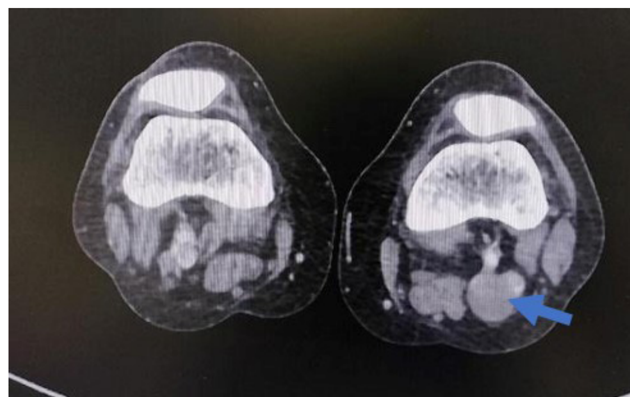

Figure 1: CT scan (axial view) - presence of popliteal vein aneurysm with a maximum calibre of 22 mm (arrow).

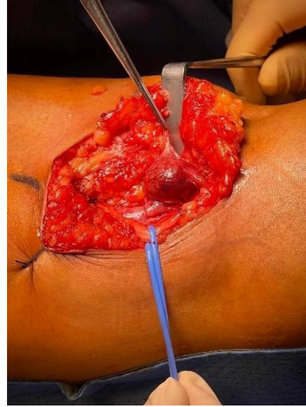

Figure 2: Intraoperative finding of a saccular popliteal vein aneurysm with 2×2.5 cm (arrow). The blue loop refers to the tibial nerve.

Discussion

Although venous aneurysms are rare entities, when present, they are frequently encountered in the popliteal vein with a described prevalence of 0.06% among patients with underlying venous disorders. Due to their asymptomatic nature, popliteal vein aneurysms are frequently under-reported; nevertheless, clinical awareness is essential given they can be associated with serious complications, namely deep vein thrombosis and pulmonary embolism.

There are some etiological factors proposed to explain the development of popliteal vein aneurysms: trauma, including vein compression by the head of the gastrocnemius muscle, inflammation, congenital vascular malformations and local hemodynamic factors. However, the exact mechanism responsible for its development remains unclear [3,4].

The clinical presentation of popliteal vein aneurysms can vary; they are typically asymptomatic, being detected as incidental findings on imaging studies, but they can cause pain or swelling in the affected limb, as in the case presented. They can also present with some complications, namely as a deep vein thrombosis or a pulmonary embolism that may recur without an obvious source.

Doppler ultrasonography remains the first-line imaging modality owing to its wide availability and low cost. However, for a better delineation of vascular anatomy, additional imaging modalities may be required to plan surgical intervention, such as CT angiography, MRI or venography [3-5].

In terms of treatment, owing to their infrequency, no standardized management protocol exists. Nevertheless, surgical treatment remains the most frequent approach due to the complications associated with popliteal vein aneurysm and the low success rate of systemic anticoagulation alone in preventing them. For small (<20 mm) asymptomatic fusiform aneurysms, some authors suggest a conservative approach with close monitoring, given their comparatively lower risk of thromboembolic complications. However, the long-term outcomes of this approach remain uncertain [4-6].

Several surgical techniques are available, with tangential aneurysmectomy with lateral venorrhaphy being the most frequently employed, as in the case presented. Other options include resection with end-to-

end anastomosis, resection with interposition graft, or ligation of the proximal and distal veins.

Anticoagulation in the postoperative period is another key element in the treatment of this entity. Most authors recommend continuing anticoagulation for 3 to 6 months after surgery to support endothelial healing and reduce the risk of graft or suture-line thrombosis [5,6].

Conclusion

Although popliteal vein aneurysms are rare entities that frequently go unnoticed as they are asymptomatic, they carry a significant risk of thromboembolic complications and clinical awareness is therefore essential. When diagnosed, surgical repair should be the preferred approach, unless they are small and asymptomatic, in which case close surveillance may be a reasonable alternative.

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