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Case Report

Embolic popliteal venous aneurysm revealing a congenital venous anatomical variation: A case report and literature review ☆

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ABSTRACT

Venous aneurysms of the lower limbs are rare, and those located in the popliteal area are the most described. Congenital anatomical variations have been reported but are also exceptional. They can affect both superficial and deep veins. The risk of thromboembolism is present in deep locations, particularly in the popliteal area or in venous drainage malformations. We report the case of a pulmonary embolism revealing a venous aneurysm involving an atypical drainage vein. The contribution of Doppler ultrasound, CT scan, MRI, and venous Doppler was crucial for establishing the diagnosis. Surgery is the treatment of choice, combining in our case aneurysmorrhaphy and anticoagulation, with good patency observed in follow-up controls.

Introduction

Unlike arterial aneurysms, venous aneurysms are rare, but the popliteal location is among the most frequently described [1]. Congenital anatomical variations have been reported but are also exceptional [2]. Although these aneurysms are often discovered incidentally, they can be symptomatic, particularly in the form of intra-sac thrombosis that may embolize [1]. We report the symptomatic case of a large popliteal aneurysm developed on an atypical popliteal-femoral deep drainage vein.

Clinical case

A 22-year-old man, an athlete with no significant medical history or cardiovascular risk factors, was hospitalized urgently for respiratory distress due to a pulmonary embolism, which was treated medically with anticoagulants. The venous Echo-Doppler examination of the lower limbs revealed a large aneurysm measuring 4 cm in diameter and 6.4 cm in length, described as developed on an accessory left popliteal vein. No residual intra-sac thrombus was detected. A

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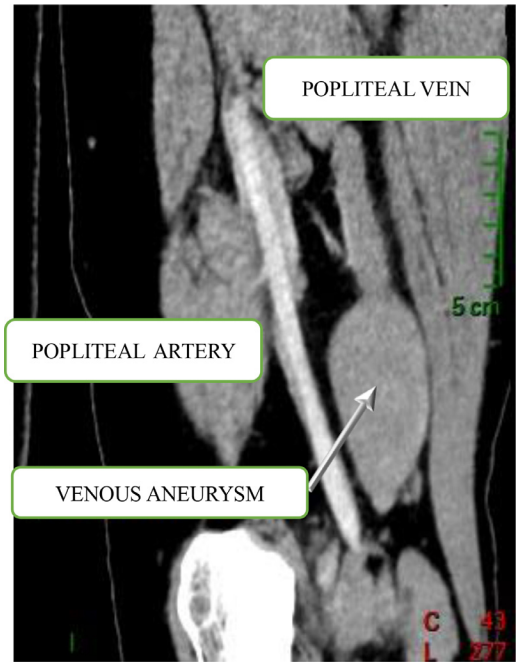

Fig. 1 – Image of CT angiography of the lower limb arterial and venous phases in the sagittal plane showing the venous aneurysm of the popliteal region.

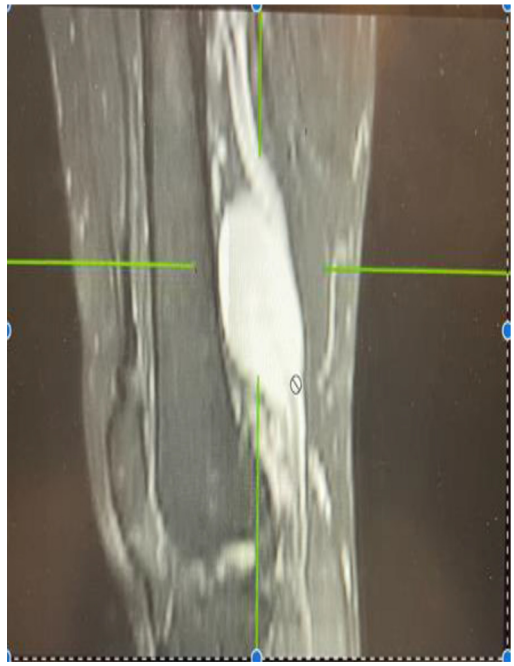

Fig. 2 – Image of lower limb MRI venography in the sagittal plane showing the venous aneurysm draining into a venous axis that does not follow the femoral axis but follows the deep femoral axis.

CT scan and MR angiography confirmed the presence of this aneurysm and its development on a vein draining into the deep femoral venous network (Figs. 1 and 2) . The diagnosis of pulmonary embolism due to migration from this aneurysm was made. Given the size of the aneurysm, the young age of the patient, and the risks associated with the long-term maintenance of anticoagulant therapy, we decided to propose resection of the aneurysm (Fig. 3) while preserving the patency of the main draining vein of his lower limb.

Aneurysmorrhaphy was performed 3 months after the diagnosis. The aneurysm did not contain any residual thrombus. The postoperative course was straightforward, and the maintenance of normal venous return on the Echo-Doppler control at 3 months allowed for the cessation of anticoagulant treatment.

Discussion

While popliteal vein aneurysms (PVA) are uncommon, it is even rarer for them to occur on a congenital anatomical variation [3,4]. This diagnosis, suggested by ultrasound, was confirmed by cross-sectional imaging and intraoperative findings. The embryogenesis of the venous circulation of the lower limbs was described by Osler in 1913 [5].

Blood vessels develop in relation to 3 neural axes: the axial plexus associated with the sciatic nerve, the preaxial plexus accompanying the main arterial pathway (superficial femoral) , and the femoral plexus that connects the popliteal region to

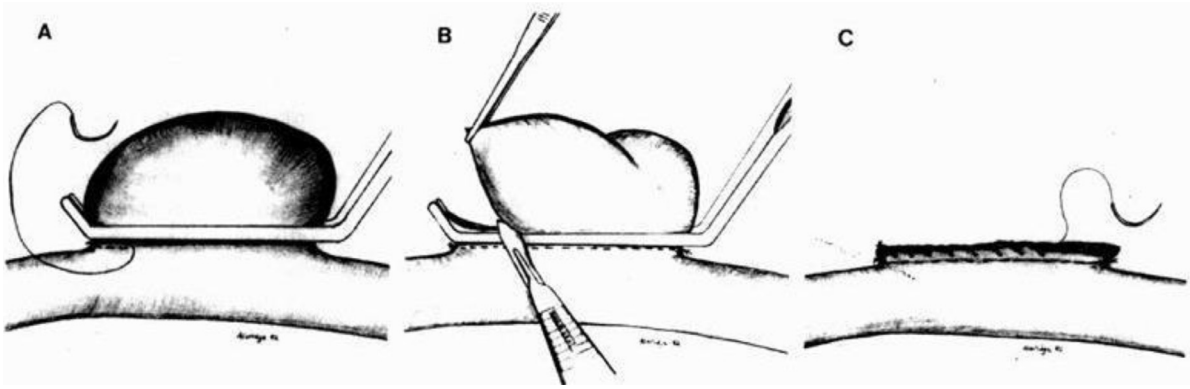

Fig. 3 – Schematic representation of the surgical treatment of aneurism of the popliteal vein: Aneurysmorrhaphy of the popliteal venous aneurysm and closure with prolene 6/0.

the deep femoral or common femoral region near the femur. Involution during the growth of the embryo and then the fetus results in either a single drainage system (unilocular) persisting in more than 90% of cases or 2 systems (bilocular) . In unilocular forms, the superficial femoral vein may be hypoplastic, and drainage occurs through the deep femoral vein, as in the reported case [6–11].

In the context of pulmonary embolism (PE) , a popliteal vein aneurysm (PVA) requires surgical treatment regardless of its diameter, shape, or the presence of a thrombus. When an asymptomatic PVA is discovered, the treatment approach is controversial. Surgical intervention may be considered for a saccular PVA, regardless of diameter, or a fusiform PVA measuring greater than 20 mm. Small fusiform aneurysms (<20 mm) should be monitored with Doppler ultrasound.

Among the surgical techniques used, aneurysmorrhaphy—where a tangent resection of the aneurysm is performed with lateral suturing (for saccular types) —is the most utilized [1].

The distance between the upper popliteal artery and the popliteal vein is very suggestive of this anatomical variation (Figs. 1 and 2) . The hypoplasia of the superficial femoral vein necessitates preserving the patency of this drainage vein to avoid the risk of venous hypertension upstream and its consequences.

Conclusion

Congenital anatomical variations of the veins in the lower limbs are rare. They can be aneurysmal, such as modal distribution popliteal veins. When these aneurysms are large or symptomatic, aneurysmal resection is justified while preserving the patency of this collecting trunk.

Patient consent

Complete written informed consent was obtained from the patient for the publication of this study and accompanying images.

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