Popliteal Vein Aneurysm Associated with Varicose Veins, Hydrocele, and Multiple Congenital Osteomas: A Case Report and Review of the Literature

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Disclosure

Speaker name: Ahmed M.T. Ghanem

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

☐ I do not have any potential conflict of interest
case
A 27 years old man presented with chronic pain and multiple left lower limb swellings. He had a long history of plastic surgeries of the face for the removal of congenital multiple osteomas (Fig. 1).

(A.Ghanem et al, Vasc Specialist Int, 2019)
Fig. 1. (A, B) Multiple osteomas on both hands (blue arrows). (C) Radiographic image showing deformities in both hands with multiple osteomas (orange arrows).
The examination revealed abnormally distributed varicosities in the lateral, medial, and anterior aspects of the thigh, in lateral knee, and lateral leg, lower limb swelling, scrotal hydrocele, and multiple osteomas causing disfigurement in the face, upper limb, lower limb, and fingers.

(A.Ghanem et al, Vasc Specialist Int, 2019)
Duplex ultrasound (DUS) and magnetic resonance venography showed primary varicose veins with a patent deep venous system. Unexpectedly, a left PVA measuring 2.3 cm in diameter and 4 cm in length was found (Fig. 2). Because of the high risk of PE, open surgical excision of the PVA with lateral venorrhaphy was performed through a medial approach (Fig. 3).
Fig. 2. (A) Axial view of magnetic resonance venography showing a left popliteal vein aneurysm (PVA) with intraluminal thrombi (yellow arrow). (B) Coronal view of the left PVA (yellow arrow), showing superficial varicosities in the lateral thigh and calf (orange arrow) and a scrotal hydrocele (blue arrow). (C) Superficial varicosities (red arrows) and PVA with intramural thrombi (yellow arrows).

(A.Ghanem et al, Vasc Specialist Int, 2019)
A 10-12-cm longitudinal skin incision was made on the medial aspect of the thigh along the anticipated anterior border of the sartorius muscle. Dissection has been performed till popliteal vein was exposed. Once the popliteal vein was exposed, the thin aneurysm sac could be easily differentiated from a grossly normal vein wall, and a vascular clamp was placed tangentially across the transition area.
The clamp was then undersewn with running mattress stitches using 6/0 vascular sutures. **Rivaroxaban 10 mg** (Xarelto, 10 mg once daily; Bayer, Leverkusen, Germany) was administered postoperatively, for prophylactic anticoagulation. Three months later, DUS revealed deep vein thrombosis in the popliteal vein. Therapeutic anticoagulation was continued for 3 months thereafter.

(A.Ghanem et al, Vasc Specialist Int, 2019)
Fig. 3. (A) Exposure of the left popliteal vein aneurysm through a medial approach (arrows). (B) Photograph of aneurysm excision and lateral venorrhaphy (arrows).
Discussion
PVAs are rare. In 2006, only 105 cases have been reported in the world literature [1]. By 2018, this number has increased to only 146 cases.
Primary PVA represents a rare subset of venous aneurysms, with an estimated prevalence for asymptomatic PVAs of 0.1% to 0.2% among patients undergoing venous duplex imaging for various chronic venous symptoms [2].

PVAs can occur at any age, and they have been reported in patients aged 10-86 years. A female preponderance has been noted in three previous series, and the median ages at presentation were 51 years in men and 49 years in women [3].
The etiology of PVAs is unclear, although aneurysmal changes are known to result from increased hemodynamic pressure at the site of venous mural weakness, possibly caused by trauma, inflammation, congenital weakness, and degenerative changes [3].

In this case, the cause of the PVA was unclear, and the relationship between the PVA and the congenital multiple osteomas is unknown.
To our knowledge, **this is the first case of a combined presentation of PVA and osteomas ever reported in the English literature**. Aneurysmal dilatation may precede the formation of mural thrombi owing to turbulent venous flow. The presence of thrombi in PVAs may differ from the pathophysiology of deep vein thrombosis, which usually starts in the valve cusps or at injury sites.

(A.Ghanem et al, Vasc Specialist Int, 2019)
PVAs tend to be found in patients with severe PE without warning symptoms such as leg pain and swelling [4].

Even small PVAs have been documented to be a source of emboli, precluding the stratification of thromboembolic risk according to aneurysmal size.
Symptomatic PVA typically presents either acutely with PE or with a more chronic history of localized symptoms related to a *popliteal mass* or *venous insufficiency*. In some aneurysms, local pain originates from the PVA itself or from *direct compression of neural structures* due to aneurysmal dilatation.

(A.Ghanem et al, Vasc Specialist Int, 2019)
The size criterion for the treatment of PVA varied among different publications, with sizes two or three times larger than the normal vein size (5-7 mm) being recommended for treatment [5]. However, the best method for size measurement and the effect of the body position on the size measurement are not yet defined.

(A.Ghanem et al, Vasc Specialist Int, 2019)
The diagnosis can be made using ascending venography, computed tomography, magnetic resonance imaging, and DUS. **We recommend magnetic resonance imaging** as the best and most anatomically precise modality. However, the cost-effectiveness should also be evaluated.

(A.Ghanem et al, Vasc Specialist Int, 2019)
The treatment options for PVA are considered on a case by case basis. In patients with PE, surgery for PVA is the treatment of choice to prevent recurrence. Surgery is also recommended in cases of aneurysms with thrombus in the sac, as well as for saccular type or large fusiform aneurysms because of their high risk for thromboembolism.

(A.Ghanem et al, Vasc Specialist Int, 2019)
However, if the aneurysm is fusiform in shape and smaller than 2 cm, close observation can be performed safely without complications [6].

Although no consensus has been reached about postoperative anticoagulation, prophylactic anticoagulation may be a reasonable option [6].

(A.Ghanem et al, Vasc Specialist Int, 2019)
Conclusion
In conclusion, a PVA occurring with multiple osteomas was found, with a high degree of suspicion by the vascular surgeon, before it caused fatal PE. The patient was successfully treated with aneurysm excision and lateral venorrhaphy. He complicated with DVT despite prophylactic anticoagulation. We need an agreement about the best method for treatment and follow up.
References

Thank you