

Management of primary popliteal vein aneurysm: A case report

Primer popliteal ven anevrizmasının tedavisi: Olgu sunumu

Yunus Keser Yılmaz¹, Sevinç Şahin², Yaşar Turan³, Savaş Sarıkaya³, Meral Ekim⁴, Burak Açıkgöz¹, Ferit Çiçekçiöğlü¹, Halil İbrahim Serin⁵, Hasan Ekim¹

¹Department of Cardiovascular Surgery, Bozok University Faculty of Medicine, Yozgat, Turkey

²Department of Pathology, Bozok University Faculty of Medicine, Yozgat, Turkey

³Department of Cardiology, Bozok University Faculty of Medicine, Yozgat, Turkey

⁴Department of Biochemistry, Bozok University School of Health, Yozgat, Turkey

⁵Department of Radiology, Bozok University Faculty of Medicine, Yozgat, Turkey

ABSTRACT

Primary popliteal venous aneurysm (PVA) is a rare, but a life-threatening pathology affecting the venous system. Most of patients with PVA are asymptomatic, and pulmonary embolism may be the initial symptom. Duplex ultrasonography is an appropriate method for the diagnosis. Although management of asymptomatic PVA is still controversial, surgery is indicated in all symptomatic patients with venous aneurysms. Herein, we report a 67-year-old male patient with left PVA in whom surgical repair was performed.

Keywords: Aneurysm; popliteal vein; ultrasonography.

ÖZ

Primer popliteal ven anevrizması (PVA) venöz sistemi nadiren etkileyen, ancak yaşamı tehdit edebilen bir patolojidir. Hastaların çoğu asemptomatik olup, pulmoner emboli ilk semptom olabilir. Duplex ultrasonografi tanı için uygun bir yöntemdir. Asemptomatik PVA'nın tedavisi halen tartışmalı olsa da, venöz anevrizmalı tüm semptomatik hastalarda cerrahi endikedir. Bu yazıda, sol PVA'sı olan ve cerrahi tamir yapılan 67 yaşında bir erkek olgu sunuldu.

Anabtar sözcükler: Anevrizma; popliteal ven; ultrasonografi.

Primary aneurysms of veins are rare and they can occur anywhere in the venous system.^[1] Although popliteal venous aneurysm (PVA) is a rare entity, it may be a life-threatening, since it can be a source for pulmonary embolism (PE). Most of patients with PVA are asymptomatic, and PE may be the initial symptom in a considerable number of patients.^[2,3] Popliteal venous aneurysm was first reported by May and Nissl in 1968.^[4] In recent years, with the widespread use of venous Duplex scanning, PVA has began to be diagnosed more in patients with deep or superficial vein insufficiency. Although surgery is the preferred treatment method for symptomatic PVA, treatment

of asymptomatic patients is still unclear. Herein, we report an old male patient with left PVA.

CASE REPORT

A 67-year-old male patient was admitted to our cardiovascular surgery outpatient clinic with the complaint of leg pain on prolonged standing. The patient had a mass in the left popliteal fossa which was present since his childhood, although he was asymptomatic for many decades. Prior to the swelling, he did not have any history of trauma, inflammatory or vascular diseases. His medical history revealed diabetes

Received: April 30, 2015 **Accepted:** July 30, 2015

Correspondence: Yunus Keser Yılmaz, MD. Bozok Üniversitesi Tıp Fakültesi Kalp ve Damar Cerrahisi Anabilim Dalı, 66900 Yozgat, Turkey.
e-mail: dryunuskeser@hotmail.com

Citation:

Yılmaz YK, Şahin S, Turan Y, Sarıkaya S, Ekim M, Açıkgöz B, et al. Management of primary popliteal vein aneurysm: A case report. Damar Cer Derg 2018;27(1):47-50.

This abstract was presented at the 13th Turkish Heart and Vascular Surgery Congress which was held on the date of October 30 - November 2, 2014 in Antalya, Turkey.

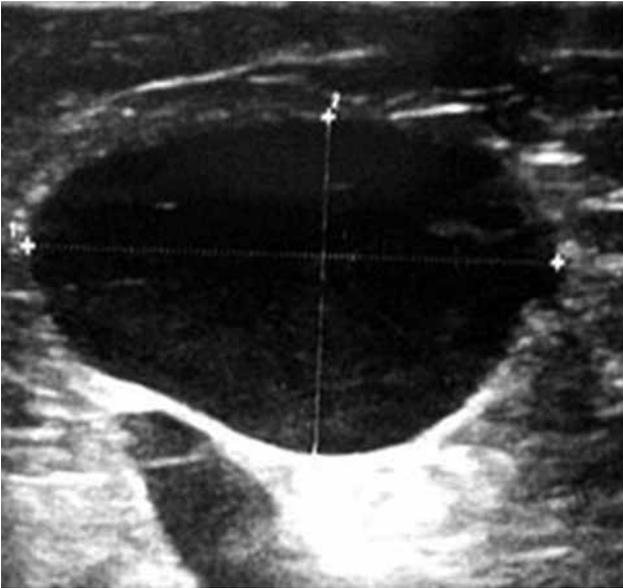


Figure 1. Duplex ultrasonography showing popliteal venous aneurysm.

mellitus and hypertension. He also underwent coronary artery bypass grafting five years ago. Physical examination revealed a soft, fluctuant mass on the left popliteal fossa. On further examination, there were no palpable cords down the extremity. To identify the nature of the mass, the patient underwent Duplex venous ultrasonography, which revealed a



Figure 3. Popliteal venous aneurysm during surgery.

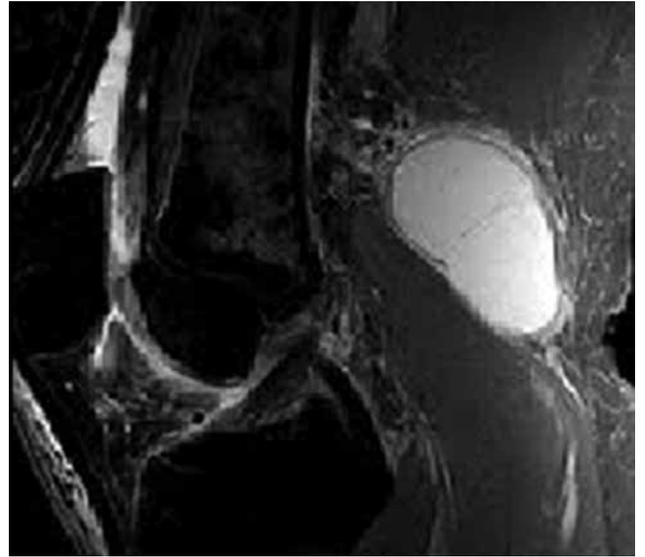


Figure 2. A magnetic resonance imaging scan showing popliteal venous aneurysm. Sagittal T₂ sequence of the popliteal venous aneurysm.

saccular PVA with a diameter of 3.52×2.25 cm in the left popliteal fossa (Figure 1). Aneurysm was also confirmed with magnetic resonance imaging (MRI) (Figure 2). Other clinical and laboratory findings were normal. A written informed consent of the patient was obtained. Low-molecular-weight heparin (LMWH) treatment was administered earlier to prevent thromboembolic complications, and it was discontinued 12 hours before surgery. The popliteal fossa was explored through a posterior approach. The PVA was exposed during surgery (Figure 3). Tangential aneurysmectomy was performed. On histopathological examination, the Verhoeff-Van



Figure 4. Histopathological image of popliteal vein aneurysm. Verhoeff-Van Gieson's staining protocol for elastic fibers.

Gieson's staining showed histochemical irregularities in elastic fibers particularly in the internal elastic lamina (Figure 4). We did not observe any complication after surgery. The patient had an uneventful recovery. He was discharged three days after surgery with the instruction of wearing compression stockings. The popliteal vein was still patent on radiological imaging six weeks after surgery, and his symptoms completely resolved.

DISCUSSION

Primary and secondary venous aneurysms are the subtypes of the venous aneurysms. Secondary aneurysms can be caused by trauma, inflammation, venous valve insufficiency, arteriovenous fistula, and degenerative changes in the venous wall. Primary venous aneurysm can be defined as a solitary area of venous dilatation containing all three layers of the vein wall which communicates with a main venous structure by a single channel, and must not be associated with an arteriovenous communication or pseudoaneurysm.^[5] Primary venous aneurysms are less common, and their pathogenesis is unclear. In the primary form with a true aneurysm, the underlying mechanism is thought to be the aneurysmal dilatation of a weak vein wall.

In our case, the patient's complaint was present since his childhood, and the absence of any connective tissue disorder, infection, trauma, or other arteriovenous malformation supported a primary venous aneurysm. The aneurysm was a true aneurysm, and there was no arteriovenous association. Therefore, we considered that it was a primary PVA. Although primary PVA is a rare vascular abnormality, it is of utmost importance to recognize, as the associated risk of PE may be fatal.^[6] Other potential complications of venous aneurysms include rupture, venous obstruction, and compression of the neighboring structures.^[7]

In case of a palpable mass in the popliteal fossa, Duplex ultrasonography, which is an easily accessible and cost-effective method, is an appropriate option for the differential diagnosis. Maleti et al.^[8] reported that the critical diameter to define a venous fusiform dilatation as an aneurysm was at least three times (>20 mm) that of the normal popliteal vein. Management of asymptomatic PVA is, however, still controversial. Surgery is indicated in all symptomatic patients. In addition, patients with

asymptomatic saccular or large (>20 mm) fusiform aneurysms should be also treated surgically, even in the absence of thrombus, due to the unpredictable risk of thromboembolic complication.^[9]

In conclusion, there are several surgical procedures, and the choice of surgical method depends on the perioperative morphological findings. Posterior approach to the popliteal fossa is feasible in most cases and may be recommended. Although aneurysmal resection and end-to-end anastomosis are widely adapted methods, tangential aneurysmectomy with lateral repair may be also performed in appropriate cases, as in our case. Surgery may be the most optimal treatment option for both symptomatic and asymptomatic PVAs to prevent development of thromboembolic complications. We, therefore, suggest that all PVAs should be surgically treated to prevent life-threatening severe complications.

Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Sfyroeras GS, Antoniou GA, Drakou AA, Karathanos C, Giannoukas AD. Visceral venous aneurysms: clinical presentation, natural history and their management: a systematic review. *Eur J Vasc Endovasc Surg* 2009;38:498-505.
2. Russell DA, Robinson GJ, Johnson BF. Popliteal venous aneurysm: a rare cause of recurrent pulmonary emboli and limb swelling. *Cardiovasc Intervent Radiol* 2008;31:1026-9.
3. Aldridge SC, Comerota AJ, Katz ML, Wolk JH, Goldman BI, White JV. Popliteal venous aneurysm: report of two cases and review of the world literature. *J Vasc Surg* 1993;18:708-15.
4. Roche-Nagle G, Wooster D, Oreopoulos G. Popliteal vein aneurysm. *Am J Surg* 2010;199:5-6.
5. Tschuor Ch, Dindo D, Clavien PA, Hahnloser D. A challenging hernia: primary venous aneurysm of the proximal saphenous vein. *Hernia* 2013;17:111-3.
6. Cox MW, Krishnan S, Aidinian G. Fatal pulmonary embolus associated with asymptomatic popliteal venous aneurysm. *J Vasc Surg* 2008;48:1040.
7. Herrera LJ, Davis JW, Livesay JJ. Popliteal vein aneurysm presenting as a popliteal mass. *Tex Heart Inst J* 2006;33:246-8.

8. Maleti O, Lugli M, Collura M. Anévrysmes veineux poplités: expérience personnelle. *Phlebologie* 1997;50:53-9.
9. Sessa C, Nicolini P, Perrin M, Farah I, Magne JL, Guidicelli H. Management of symptomatic and asymptomatic popliteal venous aneurysms: a retrospective analysis of 25 patients and review of the literature. *J Vasc Surg* 2000;32:902-12.