

# Giant cephalic venous aneurysm

Kishore Abuji, MS,<sup>a</sup> Deepak Kumar, MBBS,<sup>a</sup> Venkata Vineeth Vaddavalli, MBBS,<sup>a</sup> Naveen Maheshwari, MBBS,<sup>a</sup> Ritambhara Nada, MD,<sup>b</sup> Lileswar Kaman, MS, PhD,<sup>a</sup> and Ajay Savlania, MS, MCh,<sup>a</sup> Chandigarh, India

## ABSTRACT

The occurrence of venous aneurysms (VAs) is very rare, and VAs have been seldom reported in the existing literature. The etiology leading to the formation of VAs has not yet been determined. The presentation can range from asymptomatic to painful thrombosis of the sac, with rare events of pulmonary embolism. We have reported the case of a patient who had had a large cephalic vein aneurysm that was treated successfully. A 39-year-old man had presented with swelling in the left forearm that had progressively increased in size for 2 years and was associated with discomfort. On examination, a 5 × 5-cm soft compressible lesion was present over the mid-forearm that disappeared with raising of the arm. Contrast-enhanced magnetic resonance imaging showed a well-defined lesion arising from the cephalic vein. Under local anesthesia, after proximal and distal ligation, the aneurysm was excised. The histopathologic examination showed a thinned out smooth muscle wall and multifocal absence of the smooth muscle layer. The patient was doing well at 1 year of follow-up with no further degeneration in the vein wall. The formation of VAs might result from endophlebomyopathy and endophleboscrosis of the veins at the site of recurrent stress. Surgical excision should be considered when the patient is symptomatic, cosmetic disfigurement is present, and/or complications such as venous thrombosis, pulmonary embolism, and/or nerve compression have developed. (*J Vasc Surg Cases Innov Tech* 2022;8:592-5.)

**Keywords:** Aneurysm; Cephalic vein; Giant venous aneurysm; Venous aneurysm

Venous aneurysms (VAs) are rare compared with arterial aneurysms and have seldom been reported in the current literature. The etiology behind VAs is not clear. Of the proposed etiologies, endophlebomyopathy and endophleboscrosis of the veins present at the site of recurrent stress has been the most accepted.<sup>1</sup> A congenital weakness of the venous wall such as from connective tissue disorders accompanied by mechanical stress can lead to VAs.<sup>2,3</sup> In the present report, we have described the case of a patient with a cephalic VA that was successfully treated for its large size, which had caused cosmetic disfigurement. The patient provided written informed consent for the report of his case details and imaging studies.

## CASE REPORT

A 39-year-old man had presented with a soft tissue swelling over the left forearm that had been present for 2 years. It had initially been small but had progressively increased in size. He

complained of mild to moderate pain and discomfort, which had worsened during the past few months. He had no history of any trauma or intravenous catheter insertion in that limb or of a previous hospitalization. On examination, a 5 × 5-cm, soft, oval-shaped, compressible swelling was present over the flexor aspect of the left forearm, which disappeared with elevation of the limb above the level of the heart. No signs of local inflammation, infection, or neurologic deficit were present. No bruit was present on auscultation. Both radial and ulnar arteries were palpable (Fig 1, A). He also had congenital heart disease, including dextrocardia, double outlet right ventricle, major aortopulmonary collateral vessels, mitral–aortic discontinuity, and valvular and infundibular pulmonary stenosis, which had been diagnosed during our evaluation of his current presentation. The blood parameters, including total leukocyte count and C-reactive protein, were within normal limits.

The Doppler ultrasound showed a 3 × 2-cm lesion in the subcutaneous plane, arising from the cephalic vein, with no communication with the artery. Magnetic resonance imaging revealed a well-defined 5.8 × 2.7-cm, T2-weighted hyperintense lobulated lesion in the subcutaneous plane of the radial aspect of the left forearm (Fig 2). The lesion was seen in continuity with the cephalic vein without any evidence of an arteriovenous communication. The medial superficial vein in the forearm was 7.7 mm in diameter; however, it did not show any focal increase in diameter in its course. The lesion was excised under local anesthesia after ligating the proximal and distal ends (Fig 1, B). The histologic examination revealed a vein lined by endothelial cells, and the wall of the vein showed a thinned out smooth muscle layer. An ectatic pouched-out wall was present without any smooth muscle layer or calcifications, which was highlighted better by elastin van Gieson and Masson

From the Department of General Surgery<sup>a</sup> and Department of Histopathology,<sup>b</sup> Postgraduate Institute of Medical Education and Research.

Author conflict of interest: none.

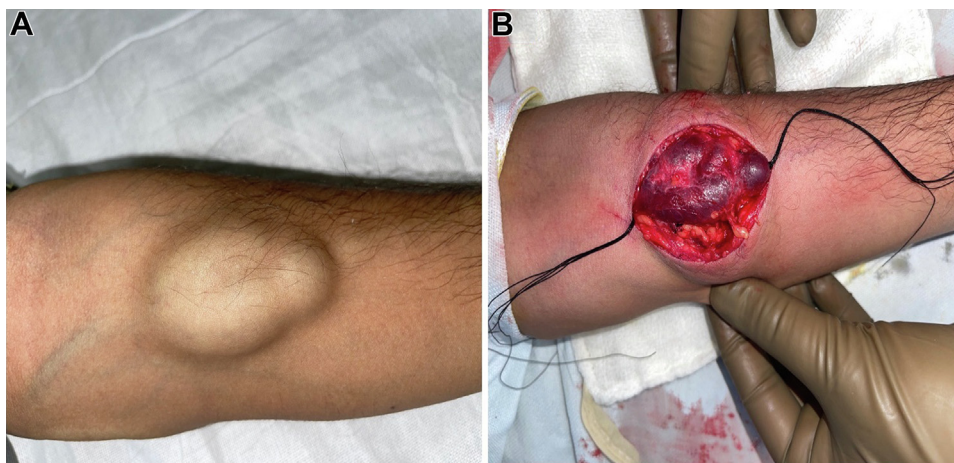
Correspondence: Ajay Savlania, MS, MCh, Department of General Surgery, Postgraduate Institute of Medical Education and Research, Chandigarh 160012, India (e-mail: [drajaysavlania@gmail.com](mailto:drajaysavlania@gmail.com)).

The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

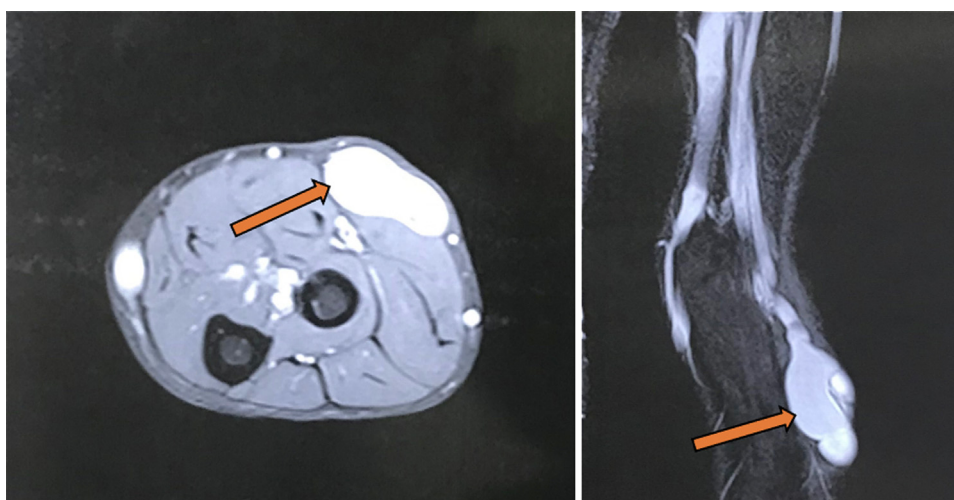
2468-4287

© 2022 The Authors. Published by Elsevier Inc. on behalf of Society for Vascular Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.jvscit.2022.08.009>



**Fig 1.** Photographs of 5 × 5-cm compressible cephalic vein aneurysm on the left forearm, after Valsalva maneuver (A) and cephalic vein aneurysm with proximal and distal control (B).



**Fig 2.** Axial and sagittal views of contrast-enhanced magnetic resonance imaging study depicting cephalic vein aneurysm (VA; arrow).

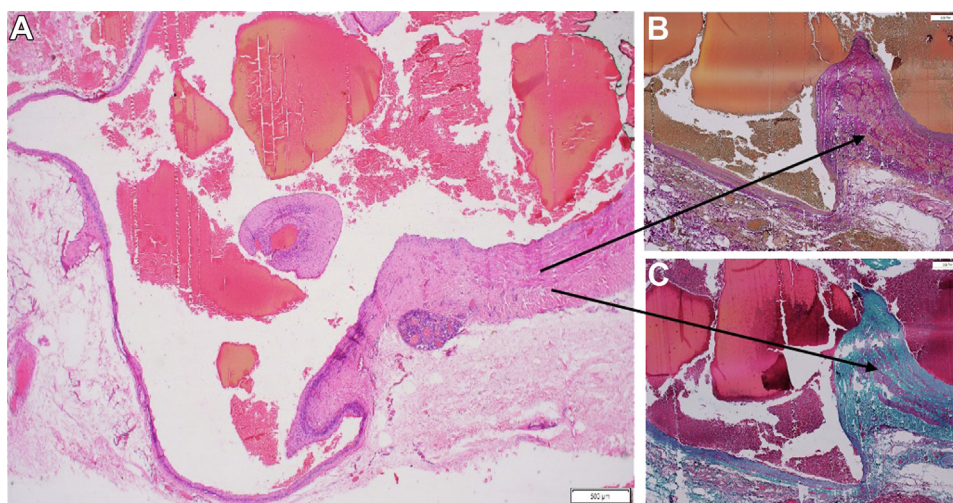
trichrome stain. The vessel wall did not show inflammatory infiltrates and did not stain for matrix metalloproteinases or organisms. The culture of the aneurysm wall did not grow any organism. The overall features were suggestive of a cephalic vein aneurysm (Fig 3).

## DISCUSSION

An aneurysm is defined as the dilatation of a blood vessel, with arterial aneurysms more common than VAs. The true incidence of VAs is unknown but has been reported throughout the body. VAs can be divided into primary (congenital) and secondary. The etiology for secondary VAs is trauma, inflammation, and venous hypertension. Congenital weakness and endophlebomyopathy and endophleboscrosis due to recurrent mechanical stress in the vein wall are the possible causes of VAs.<sup>1</sup> Data have suggested that the pathogenesis of VAs could be a congenital focal defect of the

media during formation of the venous wall.<sup>2,3</sup> Zorn et al<sup>4</sup> reported an anterior jugular VA with the absence of media and adventitia. Another case series reported jugular VAs with occlusive organizing thrombus and a thinned out vessel wall with dense inflammatory infiltrate.<sup>5</sup> However, no familial association of the VAs has been reported.

The lower extremity popliteal vein has been the most common location for VAs. Upper extremity VAs have been an infrequent entity.<sup>6</sup> One of the largest reported series of VAs showed that only 4.2% had occurred in the upper limb.<sup>7</sup> Upper limb VAs will present as a soft tissue lesion, either painless or with mild discomfort. Pulmonary embolism, which occurs frequently with lower extremity VAs, has not been reported with upper extremity VAs.<sup>7</sup> Large upper extremity VAs can cause nerve compression. If compression neuropathy is left untreated, it will cause permanent nerve damage.<sup>8</sup>



**Fig 3.** Photomicrograph showing ectatic, dilated, and thinned out venous wall with loss of elastic tissue (**B**) and muscle (**C**) compared with normal portion of vein with external elastic lamina and muscle (**A**).

**Table.** Data from previous reports of cephalic venous aneurysms

Age, years; sex	Presentation	Management	Pathology	Investigator
38; Female	Painful pigmented swelling in forearm	Excision	Dissecting vascular channels lined by endothelium with inflammation	Kobata et al, <sup>11</sup> 2018
67; Male	Soft tissue mass in wrist with neurologic symptoms	Excision	Inflammatory changes	Antonopoulos et al, <sup>8</sup> 2007
19; Male	Painless expansile lump	Excision	Medial splitting with hemorrhage	Faraj et al, <sup>6</sup> 2007
54; Male	Painful, slow growing lump	Excision	Inflammatory changes	Weeks et al, <sup>12</sup> 2018

Ultrasound is an established modality for diagnosing VAs. It is noninvasive and provides all relevant information regarding site, size, and presence of thrombi, feeding vessels, and arterial communication and can further guide the treating physician regarding the surgical plan.<sup>9</sup> Venography and magnetic resonance imaging are other modalities that can be used for the diagnosis of VAs.<sup>6</sup>

Surgery for VAs is indicated when the patient is symptomatic, asymptomatic with cosmetic disfigurement, and when complications such as deep vein thrombosis, pulmonary embolism, and/or nerve compression have developed.<sup>10</sup> In our case, the patient had had pain and a progressive increase in size with cosmetic disfigurement; thus, we chose surgical excision. Excision, instead of aneurysmorrhaphy, of the upper limb VA was chosen because of the following arguments in favor of excision. The preoperative imaging study showed a patent deep and superficial venous system of the limb. Repair of the aneurysm was possible; however, the risk of thrombosis was higher and required long-term anticoagulation. Hence, surgical excision was preferred. Previous case reports of isolated cephalic VAs are listed in the [Table](#).

## CONCLUSIONS

VAs of the upper extremity are very rare. The etiology could be a congenital weakness of the venous wall combined with mechanical stress leading to wall dilatation. Surgical excision should be considered when the patient is symptomatic, disfigurement has occurred, and/or complications such as venous thrombosis or nerve compression have developed.

## REFERENCES

- Goto Y, Sakurada T, Nanjo H, Masuda H. Venous aneurysm of the cephalic vein: report of a case. *Surg Today* 1998;28:964-6.
- Nishida K, Miyazawa Y, Matsumoto K, Okinaga K, Imamura T. Primary venous aneurysm of the forearm in a child. *Jpn J Surg* 1991;21:241-3.
- Buckberg G, McReynolds D. Venous aneurysm of the upper extremity: a case report. *Am Surg* 1971;37:83-6.
- Zorn W, Zorn T, Van Bellen B. Aneurysm of the anterior jugular vein. *J Cardiovasc Surg* 1981;22:546-9.
- Thakur UK, Savlania A, Naik AL, Singh C, Chatterjee D, Gorsi U. Clinical profile and management of external jugular vein aneurysms. *Phlebology* 2021;36:401-6.
- Faraj W, Selmo F, Hindi M, Haddad F, Khalil I. Cephalic vein aneurysm. *Ann Vasc Surg* 2007;21:804-6.
- Gillespie DL, Villavicencio JL, Gallagher C, Chang A, Hamelink JK, Fiala LA, et al. Presentation and management of venous aneurysms. *J Vasc Surg* 1997;26:845-52.

8. Antonopoulos CN, Liverakou E, Stamou C, Provatas I, Rontogianni D, Argiriou M. A case of a large cephalic vein aneurysm. *Ann Vasc Surg* 2019;61:472.e5-8.
9. Ekim H, Gelen T, Karpuzoglu G. Multiple aneurysms of the cephalic vein: a case report. *Angiology* 1995;46:265-7.
10. Calligaro KD, Ahmad S, Dandora R, Dougherty MJ, Savarese RP, Doerr KJ, et al. Venous aneurysms: surgical indications and review of the literature. *Surgery* 1995;117:1-6.
11. Kobata T, Yamada S, Mizutani KI, Kurose N, Takagi S, Machida Y, et al. A surgical case of venous aneurysm of the cephalic vein with unique clinicopathological findings for venous dissection: a possible new entity. *Open J Cardiovasc Surg* 2018;10: 1179065218 785126.
12. Weeks JK, Strauch RJ, Virk RK, Wong TT. Cephalic venous aneurysm in the wrist. *Clin Imaging* 2018;52:310-4.

Submitted Feb 23, 2022; accepted Aug 11, 2022.