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IMAGES IN CLINICAL NEUROLOGY

Tram-track sign in basal vein of Rosenthal thrombosis: An unusual cause of headache

Kalaichezhian Mariappan, **Venkatraman Indiran**

Department of Radiodiagnosis, Sree Balaji Medical College and Hospital, Chennai, India

A 65-year-old female patient was admitted with a one-day history of severe headache. The patient had no fever, neck stiffness, photophobia, or vomiting. The hemogram and cell counts, as well as renal and liver function tests, were normal. The patient had no known diagnosis of diabetes mellitus or hypertension. The blood pressure was 150/90 mmHg at the time of admission. In view of the severe headache, computed tomography angiography (CTA) of the brain was done. There was no intracranial hemorrhage, infarct, or space-occupying lesion. Furthermore, CTA did not reveal any aneurysm or vasculitis. However, a linear hypodense filling defect was observed within the lumen of the left basal vein of Rosenthal (BVR) producing a tram-track-like appearance and prompting the diagnosis of venous thrombosis involving the left BVR (Figure 1). Maximum intensity projection (MIP) images made the diagnosis more obvious due to the lack of visualization of the BVR on the left side (Figure 2). Rest of the venous sinuses, deep cerebral veins (internal cerebral veins, right BVR, and vein of Galen), and cortical veins showed normal luminal filling and enhancement. The patient tested negative for lupus anticoagulant, antiphospholipid, and anticardiolipin antibodies. Prothrombin time, activated partial thromboplastin time, D-dimer, erythrocyte sedimentation rate, and C-reactive protein levels were normal. The patient was started on low-molecular-weight heparin, and there was gradual reduction in headache, with symptom resolution after three days. She was continued on anticoagulant therapy with warfarin for the next three months and was symptom-free. Written informed consent was obtained from the patient.

Figure 1. Computed tomography angiography source image shows linear hypodense filling defect within the lumen of the left BVR, producing a tram-track-like appearance (white arrow). Black arrow shows the normal right BVR.
BVR: Basal vein of Rosenthal.

Correspondence: Venkatraman Indiran, MD. Department of Radiodiagnosis, Sree Balaji Medical College and Hospital, 600044 Tamilnadu, India.
E-mail: ivraman31@gmail.com
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Figure 2. Axial MIP reconstruction of the CTA shows the lack of visualization of the left BVR in its expected location (white arrow). Black arrows show the normally enhancing right BVR. Bilateral posterior cerebral arteries appear normal (curved white arrows).

MIP: Maximum intensity projection; CTA: Computed tomography angiography; BVR: Basal vein of Rosenthal.

Isolated spontaneous thrombosis of the BVR is rare and has been reported only three times; however, a tram-track appearance in the BVR has not been previously described.[1-3] Basal veins of Rosenthal are paired, paramedian veins that originate on the medial surface of the temporal lobe and run posteriorly and medially, lateral to the midbrain, through the ambient cistern, to drain into the vein of Galen with the internal cerebral veins. The vein of Galen then joins the inferior sagittal sinus to form the straight sinus. Basal veins of Rosenthal are closely related to the posterior cerebral arteries.[2] They may present with a hemorrhagic infarct or cranial nerve palsy.[1] Hockey-stick appearance in the left ambient cistern on noncontrast computed tomography was described in thrombosis involving the BVR.[2] The tram-track sign of a filling defect in the vein, described in cortical vein thrombosis on conventional angiography, was also observed on CTA.[4,5] Isolated thrombosis of the BVR is a challenging and elusive diagnosis for neurologists and radiologists, and lack of BVR visualization on MIP images of CTA and contrast-enhanced magnetic resonance venography, along with a tram-track appearance on the source images, is the key imaging finding.

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REFERENCES

1. Qiu MJ, Tian J, Luo W, Zhang BR. Unilateral isolated basal vein thrombosis associated with deep cerebral venous infarction. Chin Med J (Engl) 2018;131:1744-5. doi: 10.4103/0366-6999.235876.
2. Chakrabarti R, Bhatia V, Saroch A. The "Hockey-Stick" sign: Spontaneous unilateral basal vein thrombosis. Neurol India 2021;69:779. doi: 10.4103/0028-3886.319206.
3. Scapin E, Schirru F, Ferrari A, Siotto P, Comelli S, Frongia V et al. Unilateral isolated thrombosis of the basal vein of Rosenthal: A diagnostic challenge for radiologists. European Congress of Radiology. February 27-March 3, 2019, Vienna, Austria: ECR; 2019. doi: 10.26044/ecr2019/C-2374.
4. Isolated cortical venous thrombosis. Available at: https://neuroangio.org/sample-page/case-archives/isolated-cortical-venous-thrombosis/ [Accessed: 18.10.2024]
5. Celebisoy M, Basoglu M, Mertoglu O, Guler C, Ozer B, Irtman G. Presentation of two cases with deep cerebral vein thrombosis. Turk J Neurol 1999;5:55-57.