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An Illustrative Case of Vein of Labbe Thrombosis Presented as a Glioma

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Abstract

Cerebral vein thrombosis is a unique and rare type of cerebrovascular disease. The main challenge in identifying cerebral vein thrombosis is the presence of vague signs and symptoms that can resemble a variety of other intracranial pathologies. Our goal is to present the unique case of a young patient whose MRI scan revealed an abnormally enhancing tumor-like brain lesion that was heterogeneous in intensity and whose intraoperative view and histopathological findings were consistent with the vein of Labbe thrombosis, with ipsilateral transverse and sigmoid sinus involvement.

Keywords

- cerebral vein thrombosis
- vein of Labbe thrombosis
- malignant glioma
- magnetic resonance venography
- cortical vein thrombosis

Introduction

Cerebral venous thrombosis (CVT) is a rare cerebrovascular condition induced by blocked cerebral venous reflux and is often found in young and middle-aged adults, with an annual incidence rate of approximately 1 to 13.2 in a million.[1–3] CVT is caused by several factors, including infections, genetic thrombophilia, trauma, surgery, dehydration, pregnancy, and oral contraceptives.[4,5] However, the combination of a low incidence rate, non-specific clinical presentations, and atypical magnetic resonance imaging (MRI) has resulted in high misdiagnosis rates of CVT.[6] Our goal is to present the unique case of a young patient whose MRI scan revealed an abnormally enhancing tumor-like brain lesion that was heterogeneous in intensity and whose intraoperative view and histopathological findings were consistent with the vein of Labbe thrombosis (VLT), with ipsilateral transverse and sigmoid sinus involvement. We reviewed previously reported CVT cases with abnormal tumor-like brain lesions on MRI scans, and to the best of our knowledge, no previous case of VLT mimicking an intra-axial tumor has been reported.

Case Report

A 17-year-old boy was admitted to the hospital with a 2-week history of unilateral throbbing headache accompanied by pulsatile tinnitus and dysphasia that had worsened in 1 week. The pain was not relieved with painkillers and occurred repeatedly. Two weeks before admission, he presented to another hospital and was diagnosed with paranasal sinusitis and was prescribed amoxicillin–sulbactam. The family history was unremarkable. No trauma history was revealed. He had a smoking history of one packet of cigarettes every 2 days for the last 2 years. A physical examination revealed a body temperature of 36.7°C, a heart rate of 67 beats per minute, a respiration rate of 19 breaths per minute, and a blood pressure of 125/85 mm Hg. The patient was

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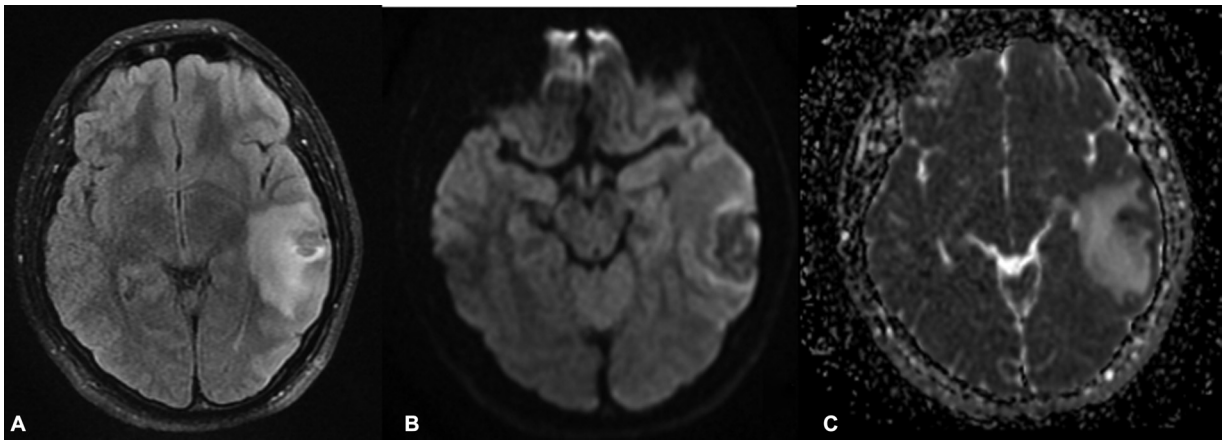


Fig. 1 Axial MRI FLAIR (**A**) demonstrates a large area of FLAIR hyperintensity, DWI hypointensity (**B**), and ADC hyperintensity (**C**) involving the left posterior temporal region, representing edema with mass effect.

conscious and cooperative. A neurological examination revealed mild dysphasia with minor difficulties with naming. Meningeal irritation signs were negative. Laboratory tests were performed after admission and revealed neutrophilic leukocytosis (13,500/mm^3, 75% neutrophils) and elevated C-reactive protein (11 mg/L). Cranial MRI revealed abnormal signals with mixed isointensity, which were slightly hyperintense on T1-weighted images (T1WI), T2-weighted images (T2WI), fluid-attenuated inversion recovery (FLAIR), apparent diffusion coefficient (ADC), and hypointense on diffusion-weighted imaging (DWI), approximately 2.4 × 1.9 cm in size with a clear boundary (►**Fig. 1**). Weak T1-weighted signal enhancement was present after the administration of gadolinium (►**Fig. 2**). Postgadolinium MRI also revealed a small caliber of the left transverse and sigmoid sinus, which was initially thought to be hypoplasia (►**Fig.3A**). A differential diagnosis of glioma, resolving hematoma, or focal infarction was thought. We validated the diagnosis of malignant glioma due to the significant mass effect of the lesion and did the surgery under general anesthesia to remove the space-occupying in the left posterior temporal region via the left transpetrosal approach. During surgery, a reddish–purplish clearly delineated lesion on the posterior temporal lobe along with a VLT was found (►**Fig. 4**). Intraperative Doppler also showed a complete filling defect of the left vein of Labbe. Pathological examination demonstrated the intravenous thrombus with mechanization and recanalization, while no neoplastic cells or vasculitis were found. Postoperative follow-up magnetic resonance venography (MRV) subsequently confirmed thrombosis in the left vein of Labbe extending into the ipsilateral transverse and sigmoid sinus and internal jugular vein (►**Fig. 3B**). He was started on enoxaparin postoperatively, and his headache progressively subsided.

Discussion

CVT is a unique and rare type of cerebrovascular diseases, including cerebral venous sinus thrombosis, deep venous thrombosis, and isolated cortical vein thrombosis induced by blocked cerebral venous reflux.[7] Diagnosis of CVT should be considered in all young and middle-aged patients with recent onset unusual headache, with stroke-like symptoms, especially with seizures, more so when it occurs in the absence of the usual risk factors for arterial thrombosis.[8]

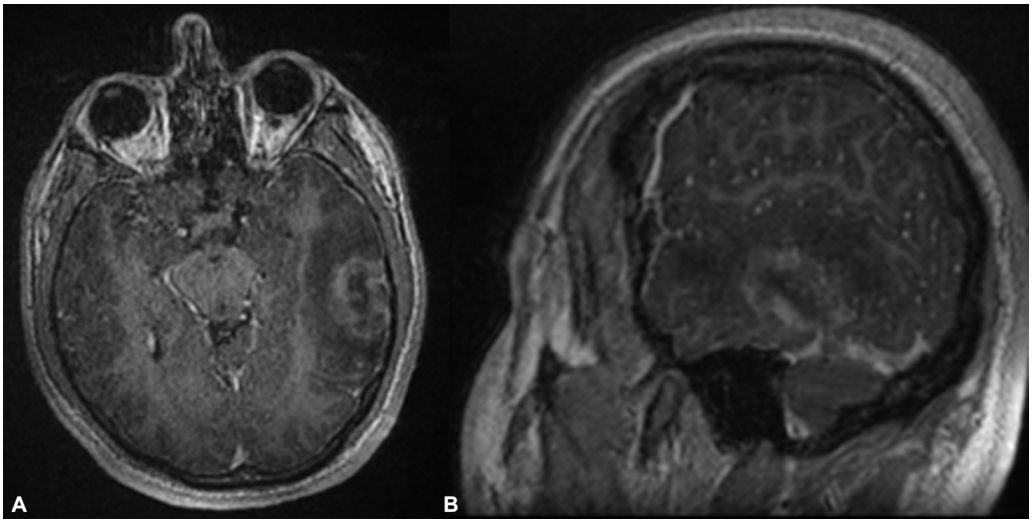


Fig. 2 Axial and sagittal T1WI MRI with gadolinium showing heterogeneous enhancement of the lesion.

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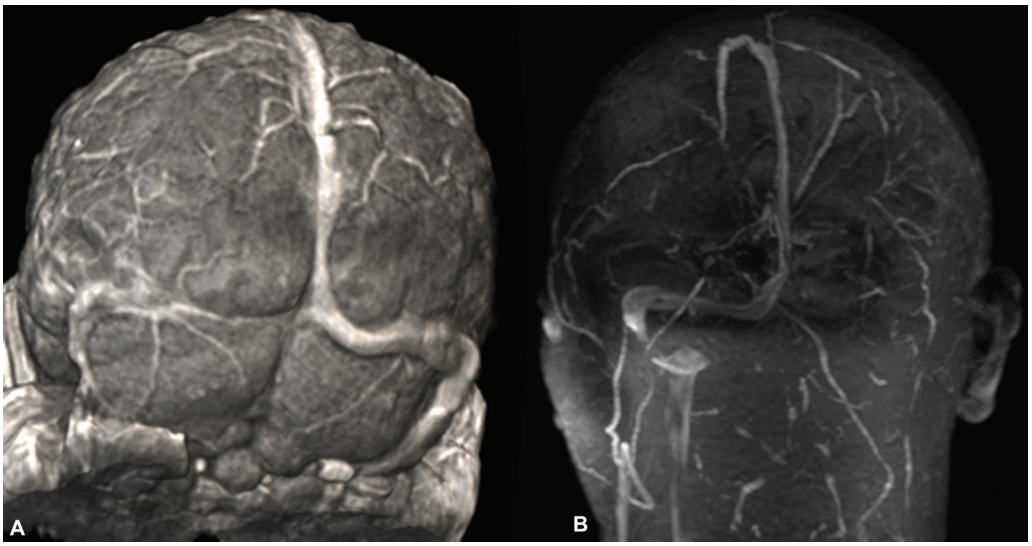


Fig. 3 (**A, B**) Postgadolinium MRI also revealed a small caliber of the left transverse and sigmoid sinus, which was initially thought to be hypoplasia (**A**). Postoperative follow-up MRV subsequently confirmed thrombosis in the left vein of Labbe extending into the ipsilateral transverse and sigmoid sinus and internal jugular vein (**B**).

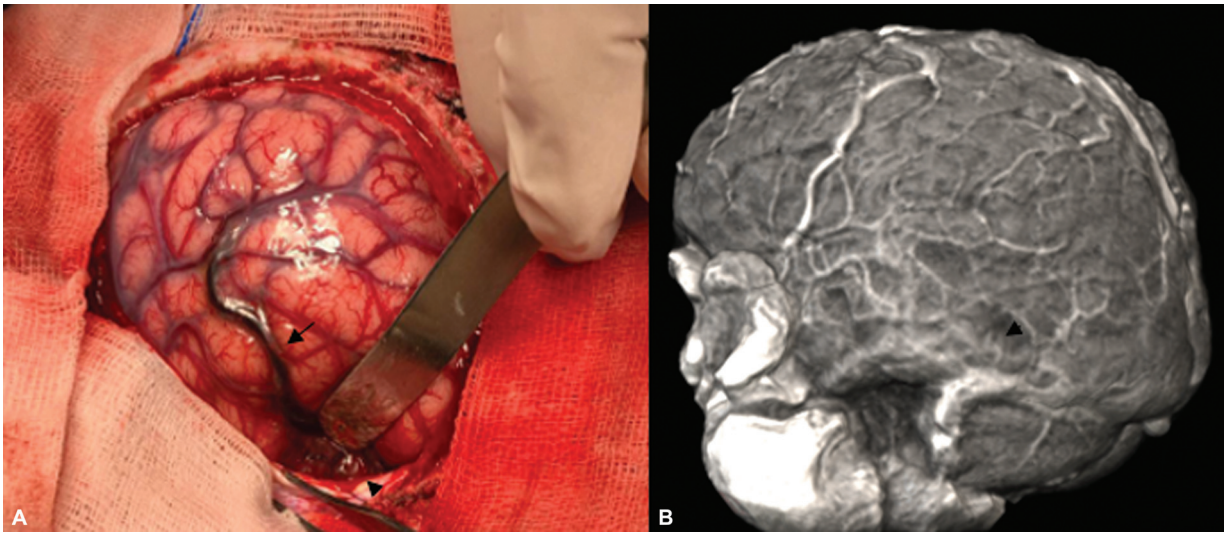


Fig. 4 Intraoperative view of a reddish-purple clearly delineated lesion along with a vein of Labbe thrombosis (*arrow*) in the left temporal lobe just above the tentorium (*arrowhead*).

The main challenge in identifying CVT is the presence of vague signs and symptoms which can resemble a variety of other intracranial pathologies. Therefore, the diagnosis depends mainly on neuroimaging methods.[9] However, the diagnosis of CVT by neuroimaging is flawed due to marked individual variations in the venous outflow patterns.[10] The patient in the current report was presented with unbearable headaches, pulsatile tinnitus, and dysphasia, possibly related to the lesions of the left temporal lobe. The initial MRI scan showed the obvious edema with a mass-like enhancement, which misled us to the probable diagnosis of malignant glioma at the beginning. Following an intraoperative view and a brain biopsy, this possibility was ruled out, and CVT was diagnosed. A possible explanation for CVT in this patient was paranasal sinusitis.

Only a few published reports have presented CVT cases where MRI revealed abnormal tumor-like brain lesions MRI.[6,7,10–14] However, we present a unique case of misdiagnosed VLT with imaging findings similar to those of a malignant glioma.

Therefore, for young and middle-aged adults with episodic and progressive headaches, the possibility of CVT should always be considered and MRI combined with MRV should be used as the preferred strategy for early diagnosis.[6]

Conclusion

We conclude that VLT can present as a space occupying lesion and should be considered as a differential diagnosis in an enhancing lesion that mimics malignant glioma.

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Funding
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Conflicts of Interest
None declared.

Informed Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for the review of the editor-in-chief of this journal on request.

References

1 Coutinho JM, Zuurbier SM, Aramideh M, Stam J. The incidence of cerebral venous thrombosis: a cross-sectional study. Stroke 2012; 43(12):3375–3377
2 Boucelma M. Cerebral venous and sinus thrombosis. J Neurosci Rural Pract 2013;4(04):381–382
3 Stam J. Thrombosis of the cerebral veins and sinuses. N Engl J Med 2005;352(17):1791–1798
4 Zhou G, Li M, Zhu Y, Zhao J, Lu H. Cerebral venous sinus thrombosis involving the straight sinus may result in infarction and/or hemorrhage. Eur Neurol 2016;75(5-6):257–262
5 Ganeshan D, Narlawar R, McCann C, Jones HL, Curtis J. Cerebral venous thrombosis-a pictorial review. Eur J Radiol 2010;74(01): 110–116
6 Xu T, Liang R. Cerebral venous thrombosis with tumor-like features: a case report and review of the literature. World Neurosurg 2019:S1878–8750(18):32932-2
7 Yu Y, Ren M, Yao S, Zhao X, Qi X. Pathological confirmation of 4 cases with isolated cortical vein thrombosis previously misdiagnosed as brain tumor. Oncol Lett 2016;11(01):649–653
8 Schaller B, Graf R. Cerebral venous infarction: the pathophysiological concept. Cerebrovasc Dis 2004;18(03):179–188
9 Gao L, Xu W, Li T, et al. Accuracy of magnetic resonance venography in diagnosing cerebral venous sinus thrombosis. Thromb Res 2018;167:64–73
10 Masuoka J, Wakamiya T, Mineta T, Takase Y, Kawashima M, Matsushima T. Thrombosis of the superior petrosal vein mimicking brain tumor. Case report. Neurol Med Chir (Tokyo) 2009;49 (08):359–361
11 Bakshi R, Lindsay BD, Bates VE, Kinkel PR, Mechtler LL, Kinkel WR. Cerebral venous infarctions presenting as enhancing space-occupying lesions: MRI findings. J Neuroimaging 1998;8(04): 210–215
12 DiRenzo D, McMahan ZH, Desai NS, Manno R, Petri M. Cerebral venous thrombosis mimicking a discrete brain mass: a case report and literature review. Case Rep Rheumatol 2018; 2018:5862912
13 Özyörük D, Karakurt N, Yazal Erdem A, et al. Cerebral sinovenous thrombosis mimicking intracranial mass. Turk J Haematol 2016; 33(03):255–256
14 Haug V, Linder-Lucht M, Zieger B, Korinthenberg R, Mall V, Mader I. Unilateral venous thalamic infarction in a child mimicking a thalamic tumor. J Child Neurol 2009;24(01):105–109

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