

# A RARE CEREBRAL VENOUS MALFORMATION MIMICKING AN EXTRA AXIAL MASS ON IMAGING

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## ABSTRACT

Cerebral varices occur mostly in association with other vascular malformations such as developmental venous anomaly (DVA), dural arteriovenous fistula (dAVF) or arteriovenous malformations (AVM). Isolated cerebral varices also known as cerebral venous aneurysms are rarely reported cerebral vascular malformations. They may mimic brain neoplasms on neuroimaging studies and cause diagnostic challenges. We present an incidentally found isolated cerebral varix mimicking meningioma in a 72 year-old man presented with headache to our emergency department following traumatic head injury.

## Introduction

Cerebral varices occur mostly in association with other vascular malformations such as developmental venous anomaly (DVA), dural arteriovenous fistula (dAVF) or arteriovenous malformations (AVM).<sup>1</sup> Isolated cerebral varices also known as cerebral venous aneurysms are rarely reported cerebral vascular malformations. Although there are few reported symptomatic cases presented with headache, hemorrhage or acute thrombosis in the literature, most of them are found incidentally on neuroimaging studies performed for other reasons.<sup>2</sup> They may mimic extraaxial mass lesions on neuroimaging studies and cause diagnostic challenges. We present an incidentally found isolated cerebral varix in a 72 year-old man presented with headache to our emergency department following traumatic head injury.

## Case Report

We present a 72 year-old man presented with headache to our emergency department following traumatic head injury. On head computed tomography (CT) a

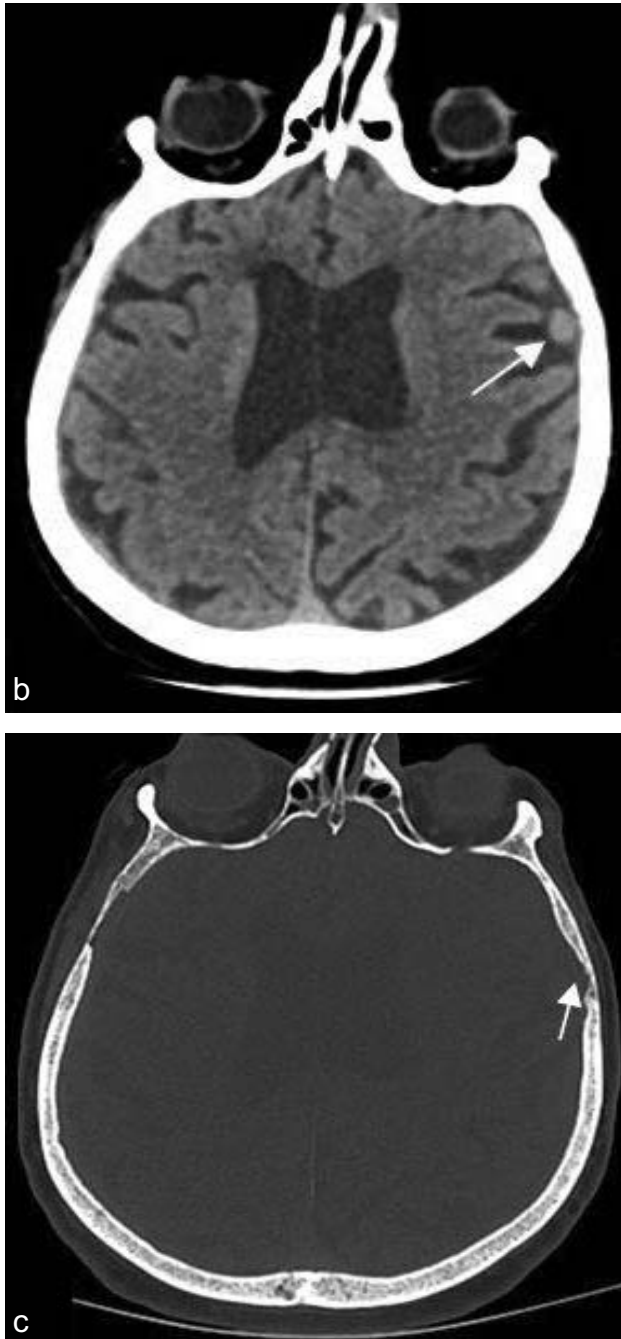
thin hyperdense acute subdural hemorrhage which was most prominent at the temporal region with maximum thickness of 4.5 mm at the level of right middle cranial fossa was observed (Fig.1a). There was an incidentally found extraaxial isodense nodular



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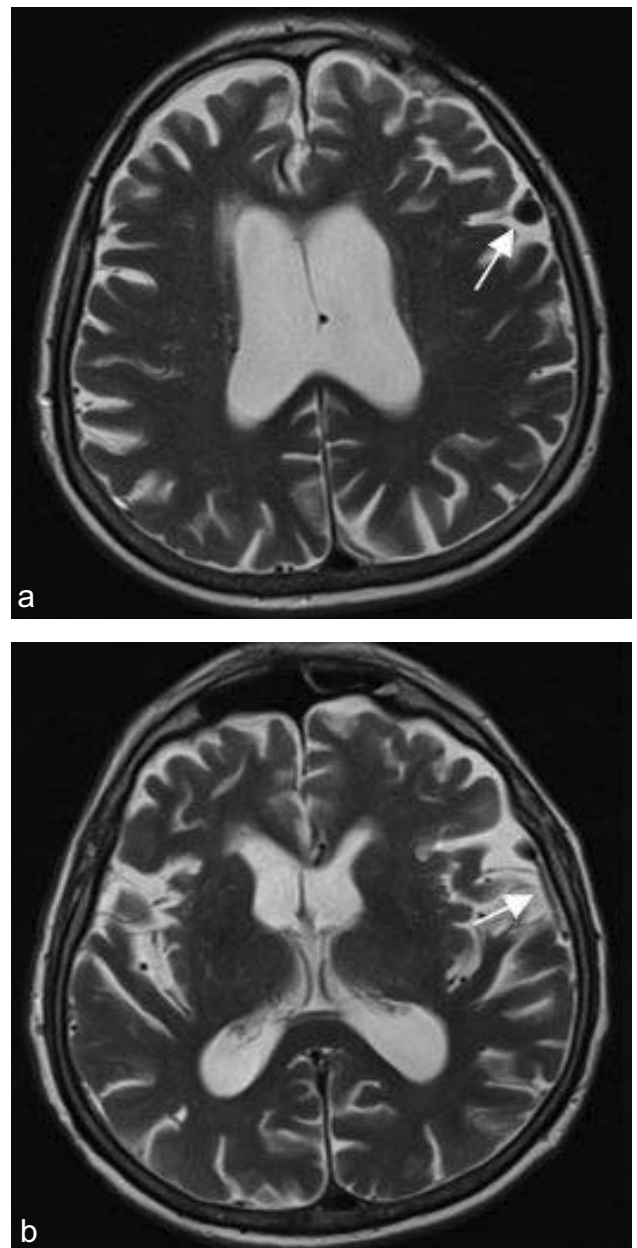
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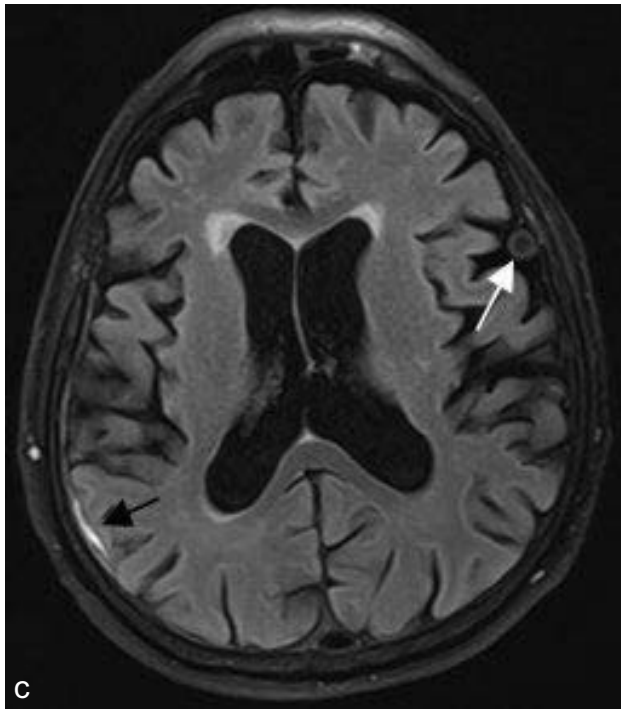
lesion with diameter of 7 mm (Fig.1b) located at the left frontal region and causing focal thinning of the adjacent frontal bone (Fig.1c) mimicking a meningioma. On magnetic resonance imaging (MRI) the lesion was found as a focal dilatation of the convexity



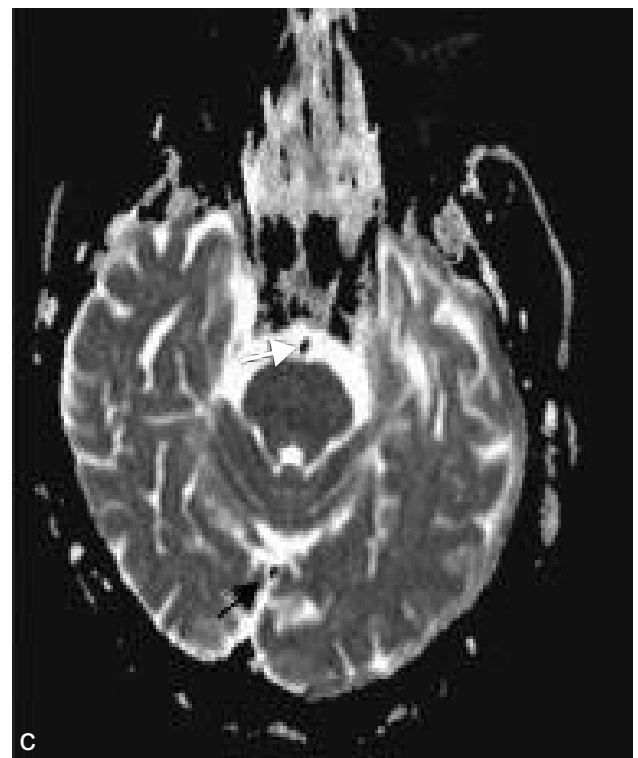
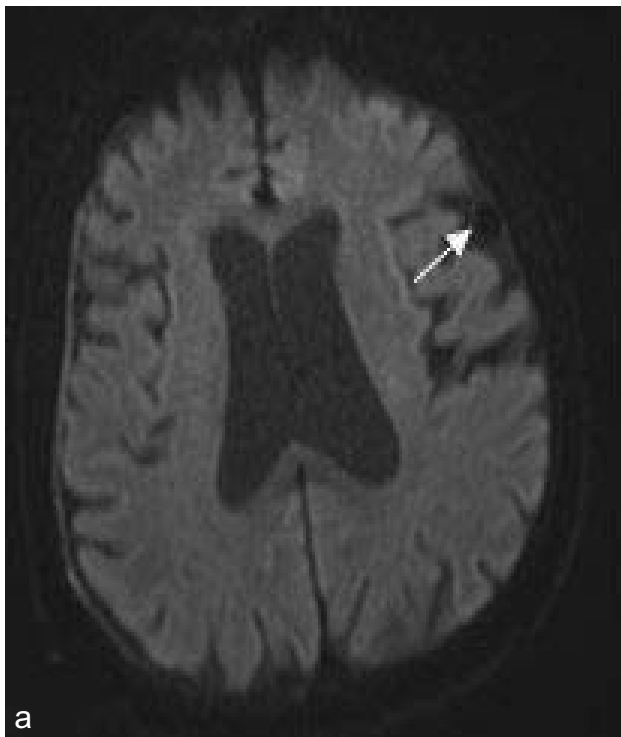
**Figure 1:** Parenchymal (a,b) and Bone (c) window axial CT images show thin acute subdural hemorrhage at the right temporal region (a, white arrow). The incidentally found left frontal extraaxial isodense nodular lesion with diameter of 7 mm was shown (b, white arrow) with associated thinning of the adjacent bone (c, white arrow).

vein having dark signal void belonging to flow signal on T2w images (Fig.2a,2b) with prominent wall (Fig.2c). There was no associated AVM or DVA. Since the neuroimaging studies were performed in the emergency setting without IV contrast, the enhancement pattern could not be seen. However, diffusion weighted imaging (DWI) with apparent diffusion coefficient (ADC) map was performed and showed the dark signal similar to seen the other vascular structures without restricted diffusion (Fig.3). The lesion was diagnosed as incidentally found isolated extraaxial cerebral cortical varix.





**Figure 2:** Axial T2w (a, b) and Flair (c) images show the focal dilatation (a, white arrow) of the left frontal cortical vein (b, white arrow) having signal void on T2w images and thickened wall demonstrated on Flair image (c, white arrow). The right sided thin acute subdural hemorrhage is also visible on Flair image (c, black arrow).



**Figure 3:** Axial DWI (a) and ADC (b) images show the lesion on the DWI image (a, white arrow). Note the absence of the bright signal on DWI image. The dark signal intensity in the central portion of the lesion on ADC map is demonstrated (b, black arrow), similar to the signals seen on the other arterial and venous structures as pointed in the basilar artery (c, white arrow) and straight sinus (c, black arrow).

## Discussion

Isolated cerebral varices (ICVs) are focal dilatations of a cerebral vein. There are no neural tissue in association with these lesions in addition to the absence of other cerebral vascular malformations. They can be extraaxial or intraaxial in location. They may be very large causing compression of the adjacent parenchyma.<sup>3</sup> On nonenhanced CT, they are seen as isodense lesions. On MRI, nonthrombosed lesions demonstrate signal void on T2W and GRE images while the thrombosed ones show increased signal intensity on both T1w and T2w images. They typically show prominent enhancement following contrast administration. However, a thin rim like enhancement was also reported.<sup>2</sup> Although, histopathological examinations reported that there was no thickened intima in these lesions, in our patient thickened wall was demonstrated.<sup>1</sup> Meningioma is the most common differential diagnosis of extraaxial isolated cerebral varices. An ICV was reported in a 55 year old female with unilateral headache mimicking convexity meningioma and diagnosed as ICV following craniotomy and resection of the lesion.<sup>4</sup> They can also mimic a thrombosed aneurysm. On the other hand, intraaxial ICVs may mimic brain neoplasms.<sup>5</sup> Since ICVs are low-flow venous malformations with very low risk of bleeding, for incidentally found asymptomatic patients conservative treatment is preferred and surgical resection is considered in symptomatic patients or in rare cases of rupture.

## Conclusion

ICVs are low-flow venous malformations usually found incidentally. They may be extraaxial or intraaxial and can mimic neoplastic lesions.

**Conflict of Interest:** None

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