

## Case Reports &amp; Case Series

## Reactive suicidality after diagnosis of large complex brainstem arteriovenous malformation

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## ABSTRACT

Brain Arteriovenous malformations (AVM) are dangerous and rare vascular malformations. They have potential to cause headache, intracranial hemorrhage (ICH), focal neurologic deficit (FND) and seizure. We report a case of a 32-year-old man with an inoperable large complex brainstem AVM. He later developed depression and anxiety, which led to his suicidal ideation and subsequent admission.

A 32-year-old man was admitted for progressively worsening vertigo of 2 years. On admission, he had dysarthria, ataxia, unstable gait, diplopia, and nystagmus in all directions of gaze including prominent vertical nystagmus on exam. The differential diagnosis was vast ranging from autoimmune diseases such as multiple sclerosis to a tumor. Imaging was warranted and CT scan of the brain without contrast was done. The scan showed a questionable hypodense area in the left midbrain, pons, and cerebellar hemisphere (Fig. 1). MRI of brain was obtained for further evaluation. The following image revealed serpiginous signal void in the same area which was consistent with vascular malformation (Fig. 2). The subsequent angiography (Fig. 3), helped further classify the malformation to being a Spetzler-Martin grade V brainstem AVM measuring approximately  $6.5 \times 7 \times 7$  cm primarily involving the left paracentral brainstem. Feeders for the AVM were from the posterior circulation with three intranidal aneurysms (2–3 mm), all draining into the deep venous system. Neurosurgery and radiation oncology was not able to treat the pathology as it posed significant risk to the brainstem. However, neurosurgery was able to do onyx embolization for the 2 of the 3 feeding vessel aneurysms. About

six months after the treatment, the patient continued to have same initial symptoms and had to file for disability. He also developed depression and anxiety after the diagnosis and treatment. Per wife, his mood became labile, he was verbally abusive towards her, and started smoking excessive amounts of marijuana. He was treated with fluoxetine 20 mg every day but approximately six months after starting treatment with fluoxetine, he was admitted for suicidal ideations.

This particular case demonstrates a rare presentation of infratentorial AVM, where the patient did not present with classic symptoms of headache, seizures, or ICH [1,2]. While the patient did have FND's, it was unrelated to seizure or ICH, the most common initial presentations of brain AVM [1–4]. In an unusual case such as this, a thorough history and physical examination can narrow the differential diagnosis for vertigo and subsequently identify patients that need imaging. Also, it is important to note that brain AVM's and brain aneurysms have been linked to depression and anxiety [3,4]. It may be beneficial to refer these patients to psychiatrist, therapist, and social worker at the time of diagnosis or even after treatment. Although ICH is the primary concern for these patients, rest of patient's profile should not be set aside.

*Abbreviations:* ICH, intracranial hemorrhage; FND, focal neurologic deficit; AVM, arteriovenous malformation

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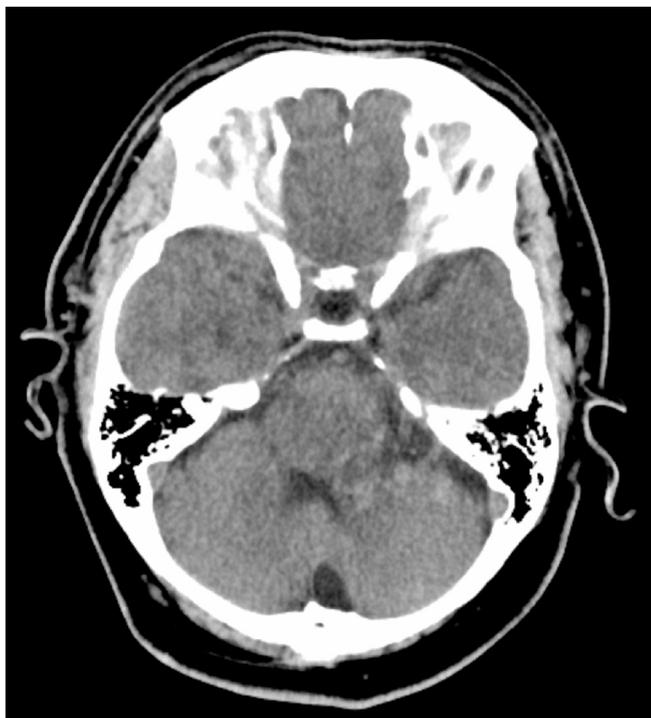


Fig. 1. Axial view of CT brain without contrast shows questionable hypodense area in the left midbrain, pons, and cerebellar hemisphere.

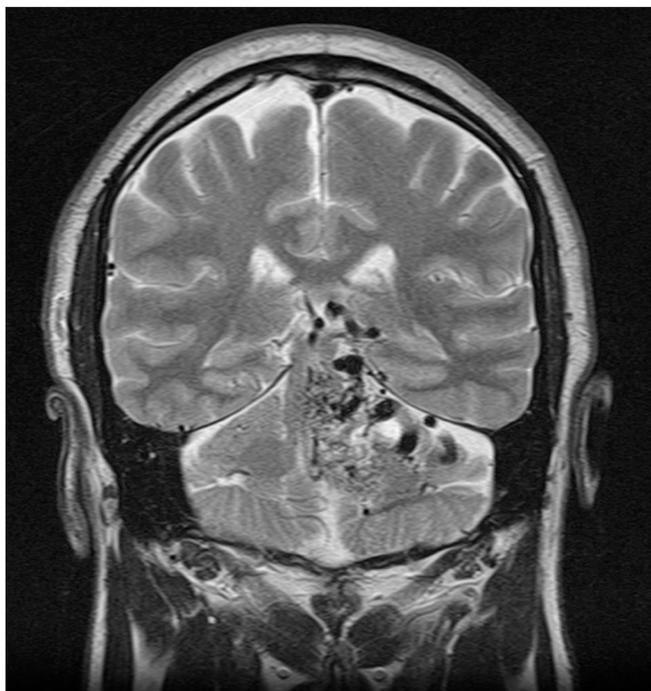


Fig. 2. Coronal view of MRI of brain without contrast shows serpiginous signal void involving the pons, midbrain, and cerebellum consistent with vascular malformation.

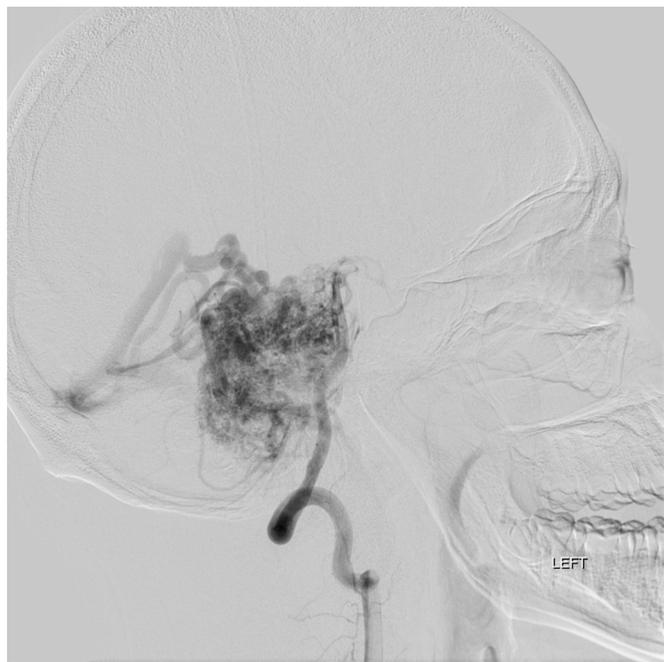


Fig. 3. Sagittal view of left vertebral artery angiography shows Spetzler-Martin grade V arteriovenous malformation due to its size (6.5 × 7 × 7 cm), eloquent location (brainstem), and deep venous drainage.

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**Declaration of Competing Interest**

The authors have no conflict of interest.

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