

IMAGES IN EMERGENCY MEDICINE

Neurology

Headache, vision changes and cranial nerve palsy after head trauma

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KEYWORDS

carotid cavernous sinus fistula, cranial nerve palsy, traumatic brain injury

1 | PATIENT PRESENTATION

A 43-year-old female was brought to the hospital after a ground level fall and her Glasgow Coma Scale was 15. Non-contrast head computed tomography (CT) scan showed small bilateral subdural hematomas, left traumatic subarachnoid hemorrhage, left occipital bone and left

longitudinal temporal bone fractures. She was managed conservatively. Interval repeat non-contrast head CT scans showed resolution of the hemorrhage. Two and a half months later she presented to the hospital with headaches, intermittent diplopia, blurry vision and a right lateral gaze palsy.

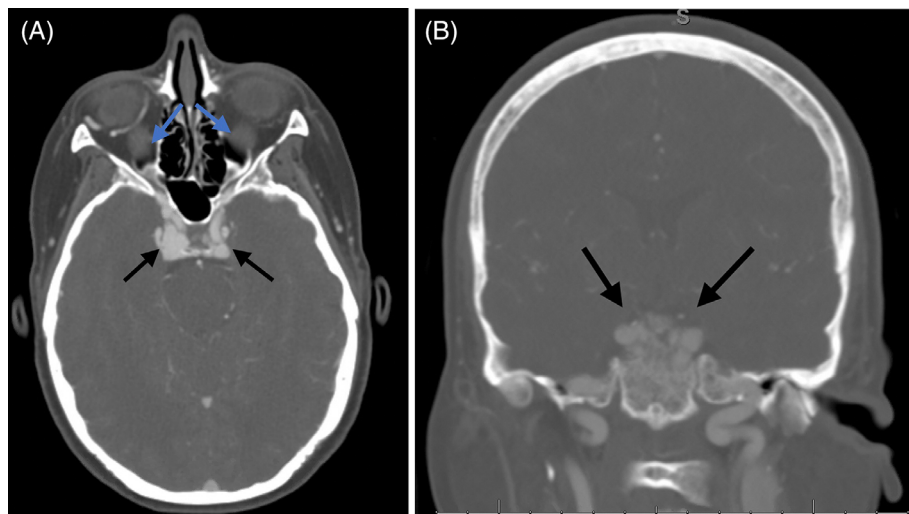


FIGURE 1 (A) Axial CT angiogram of the head showing opacification of the bilateral cavernous sinus (black arrows) and distention of the orbital veins (blue arrows). (B) Coronal CT angiogram of the head showing opacification of the bilateral cavernous sinus. Abbreviation: CT, computed tomography.

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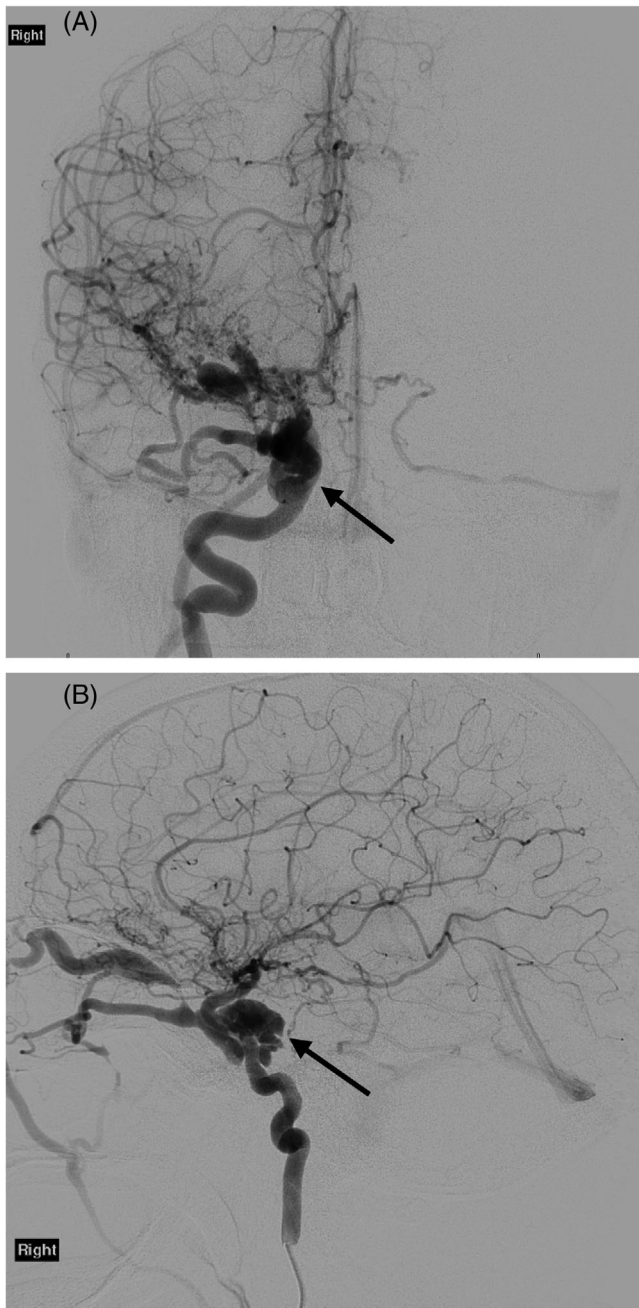


FIGURE 2 (A) Anterior-posterior view of the cerebral angiogram showing opacification of the right cavernous sinus. (B) Lateral view of the cerebral angiogram showing opacification of the right cavernous sinus.

2 | DIAGNOSIS

2.1 | Traumatic bilateral carotid-cavernous fistulas

Non-contrast head CT scan showed mild hyperattenuation in the cavernous sinus. Subsequently, a CT angiogram of the head was obtained that showed opacification of the bilateral cavernous sinus and distention of the orbital veins (Figure 1A,B). Evaluation with diagnostic cerebral angiogram showed direct bilateral carotid-cavernous fistulas

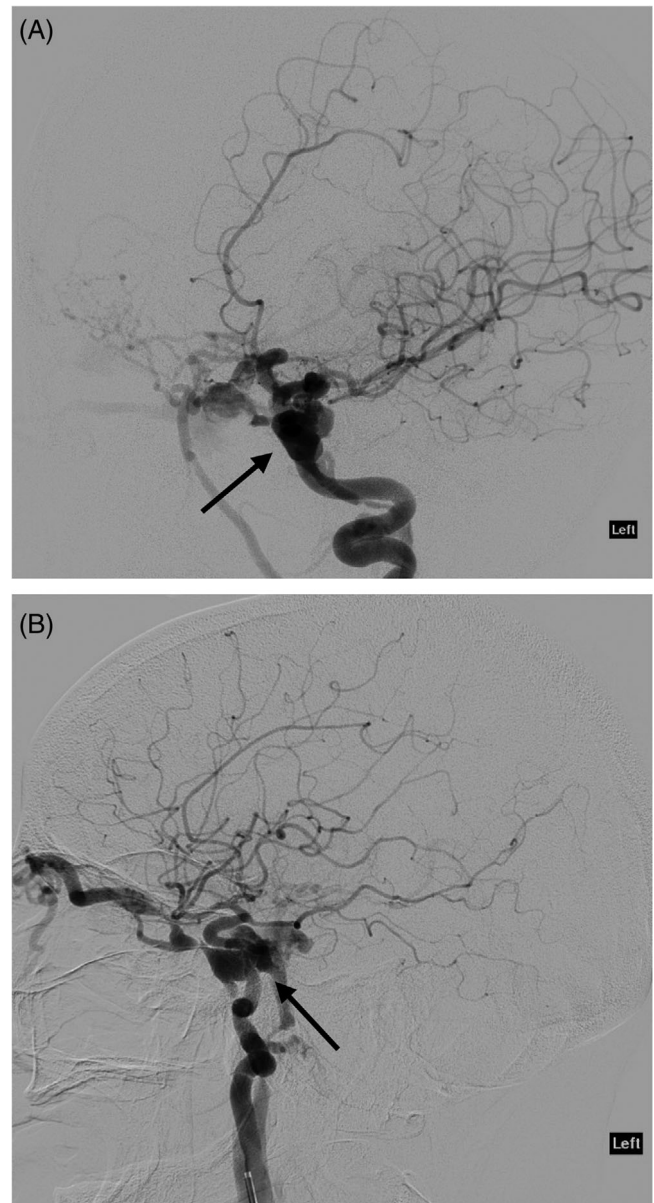


FIGURE 3 (A) Oblique view of the cerebral angiogram showing opacification of the left cavernous sinus. (B) Lateral view of the cerebral angiogram showing opacification of the left cavernous sinus.

(CCFs) (Figures 2 and 3). She underwent staged embolization of the CCFs.

Direct CCF is the abnormal connection between the internal carotid artery and the cavernous sinus.^{1,2} CCFs can present with the classic triad of chemosis, pulsatile proptosis and ocular bruit.^{3,4} Other symptoms include orbital pain, abducens nerve palsy, deterioration of visual acuity and ophthalmoplegia.^{4,5} Causes of CCF formation are traumatic, iatrogenic, connective tissue disorders and spontaneous.^{2,6-9} Traumatic CCFs formation occurs in up to 1.25% of patients with traumatic brain injury or facial and skull base fractures.^{10,11} Bilateral CCF formation is rare after trauma and symptoms develop in a delayed fashion.¹⁰⁻¹⁵ Treatment options include conservative management, open surgery, endovascular procedures and radiosurgery.¹⁶⁻¹⁸

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