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Case Report

Successful endovascular treatment of ruptured bilateral ophthalmic frontal dural arteriovenous fistula

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ABSTRACT

Bilateral ophthalmic-ethmoidal dural arteriovenous fistulas (DAVFs) are extremely rare and may present as complex lesions. These DAVFs are associated with high risk of intracranial hemorrhage but can be presented with ocular symptoms, cranial nerve palsy or epistaxis. Endovascular approaches have been used to manage an increasing proportion of complex intracranial DAVFs safely and with good clinical results. We present a patient with subdural hematoma and severe epistaxis due to ruptured bilateral ophthalmic-ethmoidal DAVF that was successfully treated by transarterial embolization with precipitating hydrophobic injectable liquid.

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1. Case presentation

A 40-year-old man presented with sudden onset of thunder-clap headache, vomiting, and epistaxis while at home. There was no clear history of trauma and loss of consciousness. The patient was ex-smoker and on regular medications for a known hypertension. General physical examinations were within normal limits. Anterior nasal packing was done due to worsening of the nasal bleeding.

Computed tomography (CT) study was performed, which showed right frontal subdural hematoma with a prominent aneurysmal-like venous channel suspicious of dural arteriovenous fistula (DAVF; Fig. 1).

Both the ophthalmic arteries were supplying the finding. Digital subtraction angiography (DSA) was subsequently performed and DAVF in the right and left basifrontal region was fed by the anterior ethmoidal branches of the bilateral ophthalmic arteries.

The pathological fistula was draining into the mid superior sagittal sinus via a venous aneurysmal-like formation (Fig. 2).

With worsening of the symptoms taken into account, endovascular treatment was planned. However, a backup surgical approach was discussed. The patient and the relatives were informed according to our local institutional policy. Under general anesthesia a 6-Fr guiding catheter was placed in the left cavernous segment of the left carotid artery. Due to excessively tortuous origin of the left ophthalmic artery

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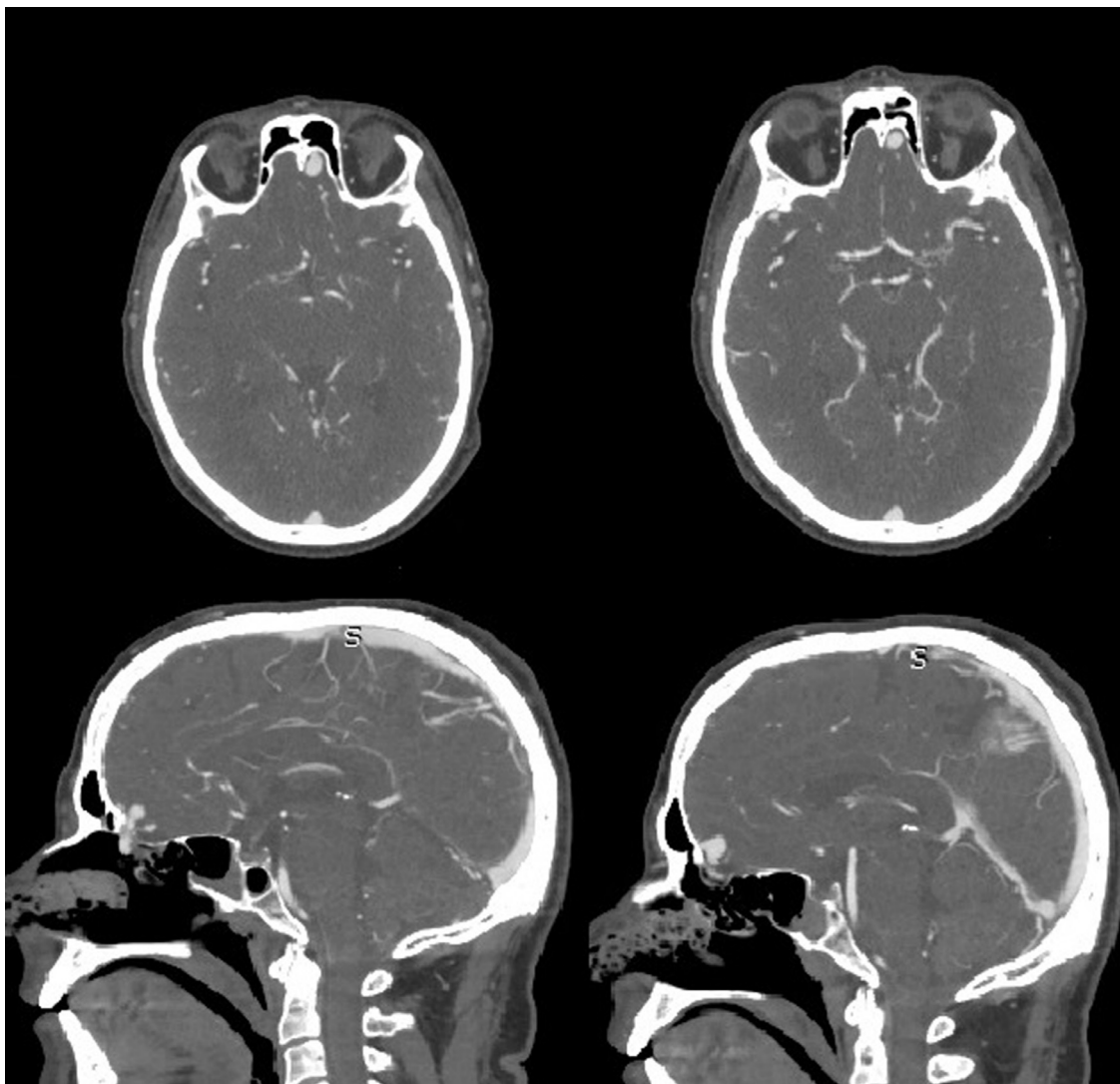


Fig. 1 – Computed tomography angiography (CTA) identified Arterio-venous (AV) fistula in frontal left lobe.

a successful catheterization was not achieved. In this case a Comaneci (0.021”) device was carefully navigated through a Headway 0’27 microcatheter (Microvention) and placed distal from the origin of the ophthalmic artery. The support from the Comaneci device was used to selectively catheterize the left ophthalmic artery via microguidewire SilverSpeed 0.010” (Covidien, Irvine, California, USA) and microcatheter Apollo with 1.5-cm detachable tip (Covidien, Irvine, California, USA). Control contrast injections were performed to confirm the safe position of the microcatheter distal to the origin of the central retinal arteries and as close as possible to the fistula. Under road map-guided injections of precipitating hydrophobic injectable liquid, 25% led to complete occlusion of the fistula

with preservation of the retinal perfusion. Any possible reflux or backflow of embolizing material was not observed during the procedure. Following control contrast injection in both the internal carotid arteries showed complete fistula occlusion and no remnant arteriovenous shunts (Fig. 3).

The subdural hemorrhage was carefully drained right after the procedure by burr hole surgery.

The patient’s condition improved 3 days after the procedure. No nasal bleeding was observed after the anterior packing removal. The patient was discharged in a week with normal neurological and laboratory hemoglobin levels. On the 30th day of control angio, there is no sign of recanalization of the fistula (Fig. 4).

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