Symptomatic Ethmoidal Dural Arteriovenous Fistula with a Draining Varix Mimicking a Ruptured Anterior Communicating Artery Aneurysm

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Dural arteriovenous fistulae (DAVF) of the anterior cranial fossa, also known as ethmoidal dural fistulae, are relatively rare and feature particular characteristics [1]. They are usually drained via cortical veins but not sinuses and therefore bear a relatively high risk of intracranial hemorrhage in comparison to dural fistulas located at other locations [1,2]. We report a patient with spontaneous subarachnoid hemorrhage secondary to an anterior cranial fossa DAVF draining via a cortical vein with a midline pseudoaneurysm. The bleeding pattern completely resembled the presentation of hemorrhage due to anterior communicating artery aneurysm, and the anterior fossa midline venous aneurysm mimicked a cerebral aneurysm in that location. To the best of our knowledge, a similar lesion has been reported in only one other case [3]. We present the diagnostic dilemma and therapeutic implications.

PATIENT DESCRIPTION
An 18 year old male with an unremarkable past medical history was brought to the emergency room after sudden-onset severe headache and repeated vomiting. The patient was alert and oriented, complained of persistent headache of moderate intensity and nausea, and exhibited significant meningeal signs. Head computed tomography (CT) scan showed subarachnoid hemorrhage focused on the lamina terminalis cistern and a round vascular mass at the anterior part of the lamina terminalis cistern over the cribiform plate. Immediately after the diagnosis was reached, the fistula was completely occluded by staged selective embolizations performed through both ophthalmic arteries. Postoperative cerebral angiography showed complete occlusion of the ethmoidal DAVF. The patient had an uneventful neurological recovery and was discharged after 3 days. Ophthalmological evaluation was normal. Magnetic resonance imaging (MRI) performed 1 month later showed no signs of residual venous aneurysm. Follow-up angiography 2 years later showed complete and persistent occlusion of the anterior cranial fossa dural fistula.

Figure 1. [A and B]
Non-contrast head CT in an 18 year old male shows subarachnoid hemorrhage focused on the lamina terminalis (star) and carotid cisterns (arrow). This bleeding pattern is suggestive of an anterior communicating artery aneurysm.
Aneurysmal venous dilatations have been reported at the chiasmati c cistern or in a more anterobasal position adjacent to the origin of the superior sagittal sinus. In our patient, the venous aneurysm was seen at a midpoint between these limits. Demonstration of the actual fistula site is usually not possible by either CT or MR; however, visualization of dilated cortical veins without a parenchymal nidus is a key finding that supported the diagnosis of DAVF. Non-invasive examinations usually raise a suspicion of DAVF and orientate the investigation, but cerebral angiography confirms the diagnosis and shows fine details of all elements of the lesion [Figure 1 C and D].

Aneurysmal venous dilatation is seen in a significant proportion of ethmoidal DAVF [2,4,5]. Most aneurysmal dilated veins associated with anterior cranial fossa DAVF are adjacent to the anterior portion of the superior sagittal sinus and drain into it. Our case was unusual in that the aneurysmal venous dilatation lay in the anterior part of the lamina terminalis cistern and resembled an anterior communicating artery aneurysm. However, a careful examination of the neuroradiological examinations revealed a more anterior and basal location of the varix in relation to the anterior communicating artery complex. Surgical planning and approaches for an anterior communicating artery aneurysm and for an anterior fossa DAVF are radically different. This case reinforces the need for the combination of advanced CT angiogram or MRI as well as digital angiography in the diagnosis and management of unusual cases of subarachnoid hemorrhage.

**References**


**A work of art which did not begin in emotion is not art**

Paul Cezanne (183-1906) French artist and Post-Impressionist painter whose work is the bridge between late 19th century Impressionism and the early 20th century's new line, Cubism. Both Matisse and Picasso are said to have remarked that Cézanne “is the father of us all”