

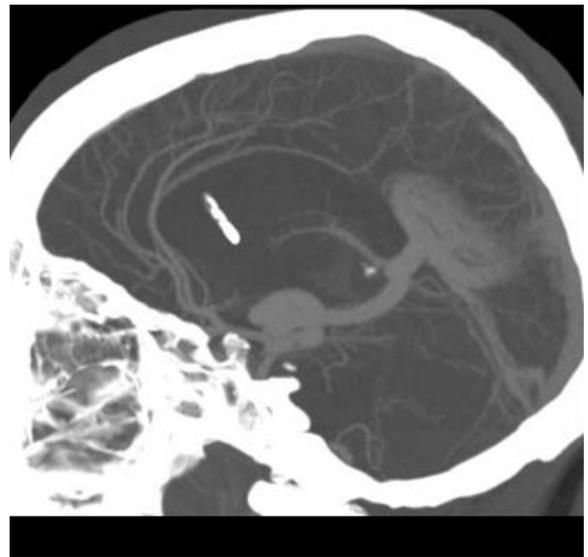


## Neurovascular Service: Vein of Galen Aneurysmal Malformations

VGAMs represent only 1% of cerebral vascular malformations, but they represent almost 30% of early childhood cerebrovascular lesions. These are caused by abnormal blood flow from arteries directly or indirectly into a primitive venous channel in the brain. Patients may present with seizure, stroke or hemorrhage. Because of the high volume and flow in these arteriovenous shunt patients may present in cardiac failure and need urgent treatment to close the lesion. There are three clinical presentations seen with Vein of Galen Malformations:

- » Neonates presenting with congestive heart failure and a cranial bruit. These are usually choroidal types with thalamoperforating arteries, choroidal arteries and pericalosal arteries shunting into the median prosencephalic vein.
- » Infants presenting with developmental delay and increasing head size. These are mural types and are composed of 1 or 2 direct arterial fistulae in the wall of the median prosencephalic vein.
- » Older children with a large head, seizures or stroke. These are often less severe types than seen in infants.

Sometimes these abnormalities can be detected in utero, and they can be severe enough to affect survival. Complications include hydrocephalus and seizures and even systemic organ failure. Treatment can be considered to close off arterial connections with platinum coils and liquid embolic agents such as N-BCA or ONYX (ethylene vinyl alcohol) sometimes in combination. Multidisciplinary approach to treatment is managed with MGH Pediatric, MGH Cardiology, MGH Neurosurgery and MGH Neurology services. Treatment is often done in stages to gradually alter the blood flow back to a more normal pattern.



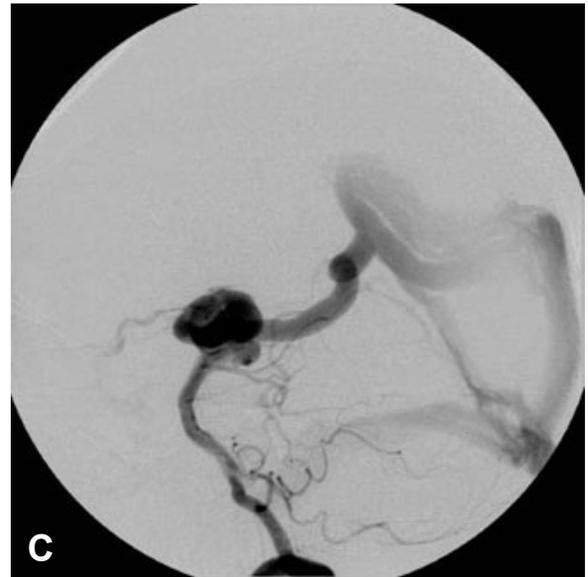
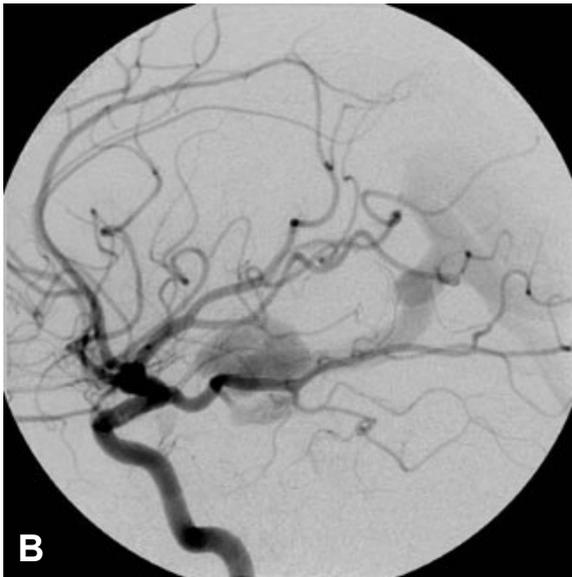
(A) CT angiogram in the sagittal plane shows a pial fistula arising from the basilar artery apex with physiology analogous to a vein of Galen malformation. A large falcine venous complex is also seen.

**Interventional Neuroradiology Program, Neurovascular Service**

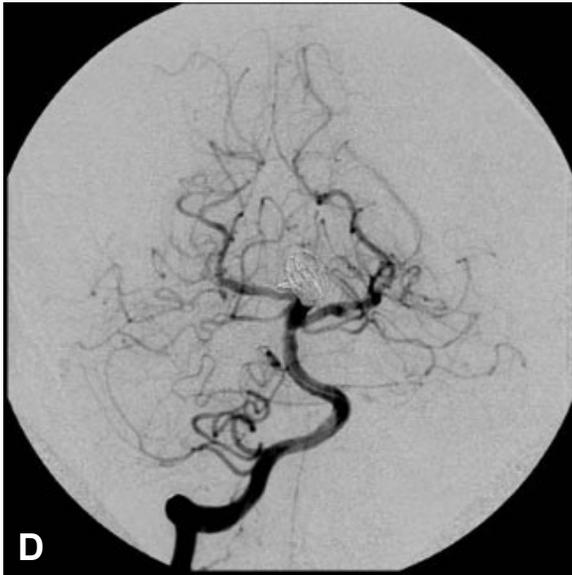
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**(B,C)** The lateral views of the right internal carotid and right vertebral arteries show supply to the lesion from both anterior and posterior circulations.



**(D)** Post coil embolization of the lesion anterior view of the right vertebral artery shows closure of the fistula and re-establishment of the normal arterial phase.

*The Neurovascular Service at Massachusetts General Hospital provides a multidisciplinary approach to patient care that combines neurosurgery, neurology and interventional neuroradiology. Based in the Department of Radiology, the Neurovascular Service's Interventional Neuroradiology Program uses minimally invasive procedures to treat a range of neurovascular disease and spinal disorders. For more information, visit [www.mgh-interventional-neurorad.org](http://www.mgh-interventional-neurorad.org)*

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