RESIDENT & FELLOW SECTION

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Mystery Case: Intracranial hemorrhage in adult vein of Galen malformation

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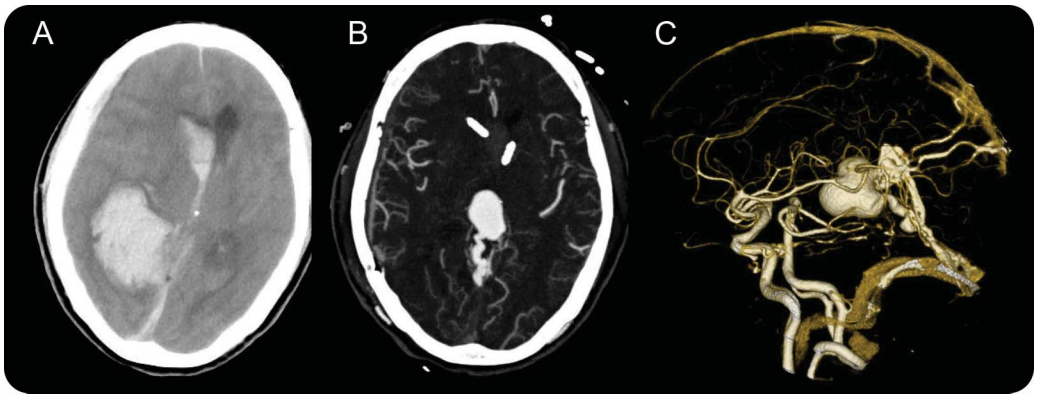
Figure Intracranial hemorrhage in vein of Galen malformation



(A) Noncontrast brain CT reveals intracranial hemorrhage at right parietotemporal region. (B) Postoperative brain CT angiography shows aneurysm of the great cerebral vein of Galen. (C) Volume rendering reformatted 3D image confirms the diagnosis of vein of Galen malformation.

A 62-year-old woman presented with sudden-onset headache and vomiting followed by loss of consciousness. Brain CT revealed right parietotemporal intracranial hemorrhage (figure, A). Subsequent CT angiography confirmed vein of Galen malformation (figure, B and C). Vein of Galen malformations develop during gestation and usually present in infancy or early childhood with heart failure or hydrocephalus.[1,2] Adult hemorrhagic presentations are rare compared with arteriovenous malformations, considering the slow-flow fistula in adults. However, subarachnoid and intracerebral hemorrhage can occur due to rerouting of blood into the pial veins. For symptomatic patients, surgical closures of the shunt and endovascular interventions are effective treatments.

AUTHOR CONTRIBUTIONS

All authors participated in the neuroimaging examinations and interpretations. The manuscript was drafted by Y.-S.T. and L.-W.C. All the authors made an intellectual contribution to the final manuscript.

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DISCLOSURE

The authors report no disclosures relevant to the manuscript. Go to Neurology.org for full disclosures.

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MYSTERY CASE RESPONSES

The Mystery Case series was initiated by the *Neurology*® Resident & Fellow Section to develop the clinical reasoning skills of trainees. Residency programs, medical student preceptors, and individuals were invited to use this Mystery Case as an educational tool. Responses were solicited through a group e-mail sent to the American Academy of Neurology Consortium of Neurology Residents and Fellows and through social media.

All 25 responses we received came from individuals rather than groups. A total of 76% identified the intracranial hemorrhage in this patient with intraventricular and subarachnoid extension. A total of 68% also recognized the midline vascular abnormality on CT angiography, with 16% correctly identifying this as a vein of Galen malformation. A total of 20% recognized the postoperative

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finding of drainage catheters in this patient's ventricles on CT angiography. The most complete answer came from Vinny Montanaro, who recognized all of the radiologic findings and arrived at the diagnosis of vein of Galen aneurysmal malformation. In thinking about the etiology, it is worth noting that this malformation is usually a slow-flow fistula; however, bleeds in this setting likely occur due to rerouting of the blood into the pial veins.

This case underscores the importance of vascular imaging in the setting of intracranial hemorrhage, and of interpreting results in the context of known arterial and venous sinus anatomy.

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