

A young woman with a first-time seizure and a huge intracranial vascular structure



Willem Jan van Rooij, Anthony Thijssen, Guus Beute, Menno Sluzewski

A 27-year-old woman presented with a first-time seizure. MRI of the head showed a large, 7 cm, round vascular structure inside the right lateral ventricle with mass-effect (figure A). Simultaneous right carotid and vertebral angiography (figure B and video 1) showed a direct high-flow arteriovenous shunt (figure B, arrow) between the right posterior cerebral artery and a grossly dilated subependymal ventricular vein. An aneurysm on the supraclinoid internal carotid artery was also seen (figure B, arrowhead). A microballoon catheter was flow directed to the afferent artery and a second microcatheter positioned just distal to the balloon (figure C, arrow points to tip of catheter). With the balloon inflated, the flow stopped and ethyl-vinyl-alcohol-copolymer glue (EVOH, Onyx, ev3, Raynham, MA, USA) could be slowly injected distal to the balloon just proximal to the shunt (figure D, arrow). The shunt

was closed and the carotid aneurysm was occluded with coils (figure D, arrowhead). Control angiography showed complete closure of both the shunt and the aneurysm (figure E, arrows, and video 2). MRI of the head the next day (figure F) showed the decreased size of the dilated vein with signal intensities consistent with thrombus.

Pial arteriovenous fistulas are rare developmental anomalies consisting of a direct connection between an artery and a vein without a nidus. Pial arteriovenous fistulas are located in the subpial space and are considered the most simple form of an arteriovenous malformation. The high flow through the shunt causes dilatation of the afferent vein. The condition presents most commonly in childhood with haemorrhage or seizures. Endovascular treatment is usually straightforward by occlusion of the shunt with glue or coils.

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Department of Radiology (Prof W J van Rooij PhD, A Thijssen MD, M Sluzewski PhD) and Department of Neurosurgery (G Beute MD), St Elisabeth Ziekenhuis, Tilburg, Netherlands

Correspondence to: Prof Willem Jan van Rooij, Department of Radiology, St Elisabeth Ziekenhuis, Hllvarenbeeksweg 60, 5022GC Tilburg, Netherlands wjvanrooij@gmail.com

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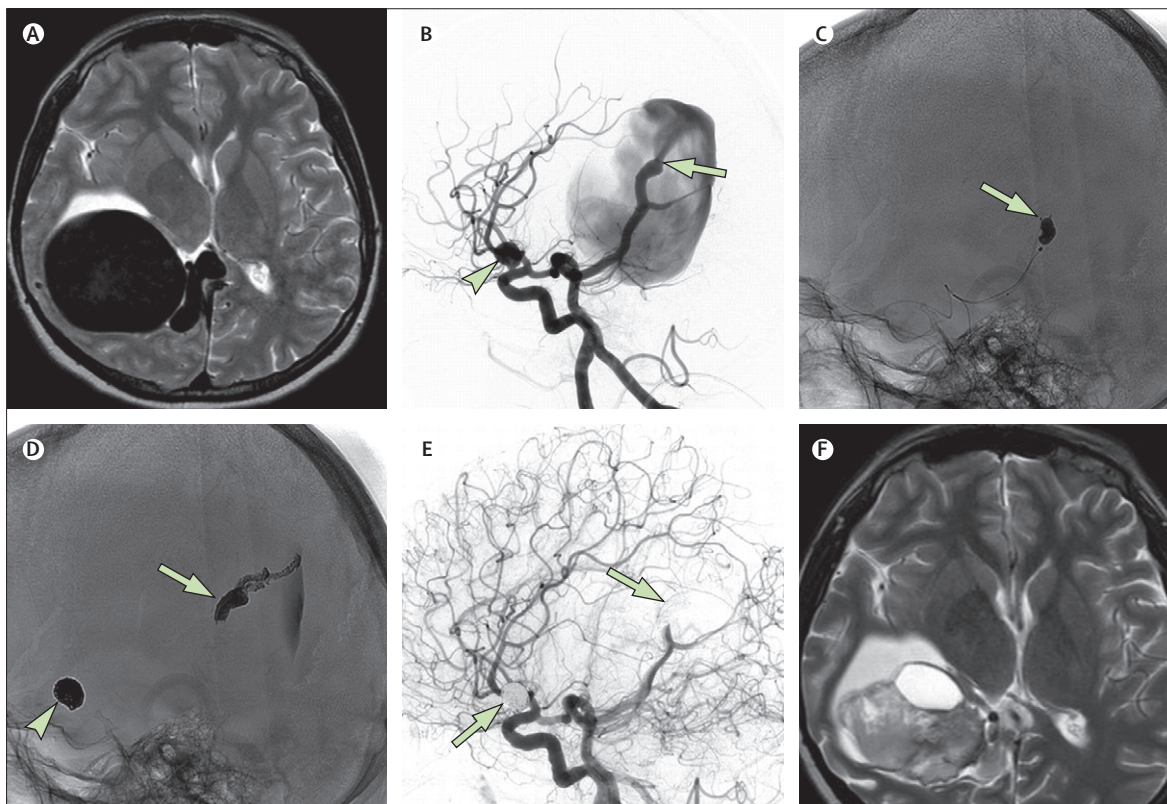


Figure: Pial arteriovenous fistula

(A) MRI of the head showing a large, round vascular structure inside the right lateral ventricle. (B) Simultaneous right carotid and vertebral angiography showing a direct high-flow arteriovenous shunt (arrow) between the right posterior cerebral artery, a grossly dilated subependymal ventricular vein, and an aneurysm on the supraclinoid internal carotid artery (arrowhead). (C) A microballoon catheter being flow directed to the afferent artery and a second microcatheter positioned distal to the balloon (arrow points to tip of catheter). (D) Ethyl-vinyl-alcohol-copolymer glue injected distal to the balloon just proximal to the shunt (arrow). The carotid aneurysm was occluded with coils (arrowhead). (E) Control angiography showing closure of the shunt and the aneurysm. (F) MRI of the head the next day showing the decreased size of the dilated vein.