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Arteriovenous Malformation

Surgical resection of a rare giant intracranial arteriovenous fistula

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Abstract	Background: It is an occasional giant case we came to recently. The young patient had no special presentation except for transient epilepsy. It was difficult to get the first impression with either CT or MRI because the mass was huge that it was difficult to locate where its root was. A careful DSA examination further gave us a probable diagnosis—AVF, which was identified through surgery. According to our literature work on PUBMED, few cases have ever been reported with such giant size.
	Case Description: A 23-year-old man presented with transient epilepsy, and routine computer topography scan only showed a giant mass with clear rounding edge, about 9 cm in diameter, significantly enhanced with contract. The radiologist's diagnosis was an intracranial aneurysm. A draining vein connecting to the superior sagittal sinus was discovered on DSA, which further confirmed the AVF. A tough yet successful operation was performed to totally remove the intracranial mass, and the patient recovered to normal.
	Conclusion: The widely accepted treatment of AVF includes endovascular coiling, surgical resection, burning or blockage of the fistulae, or the combination of endovascular and surgical treatments. Comparing to general cases, the size of the AVF in our case is rare. We successfully surgically removed the giant mass, and the patient has totally recovered.
Keywords:	Surgical resection; Giant; Intracranial arteriovenous fistula

1. Case report

A previously healthy 23-year-old man was admitted to our hospital with chief complaints of episodic limbs seizure accompanied with paroxysmal loss of consciousness for 3 years. No significant signs of the cranial nerves were found on admission. The CT of head and MRI showed a huge mass in the right hemisphere; possible diagnosis was a giant aneurysm in the right temporo-occipital lobe, which was further confirmed by DSA (Fig. 1).

A large right fronto-temporo-occipital craniotomy was performed under general anesthesia. The huge dilated aneurysmal vessel mass was accurately located in the temporo-occipital lobe. With the guidance of intraoperative real-time B mode ultrasound, MCA was identified as its parent artery, and the aneurismal mass was directly connected to the superior sagittal sinus via 3 draining veins. Under the microscope, we further prudentially dissected the arachnoid of the Sylvain through the frontal side, exploring the enlarged MCA, which was directly connected to the superior sagittal sinus. Blood stream in the parent artery was blocked to identify the relationship between MCA and the mass. The feeding and drainage segments of the feeding artery were clipped separately to trap the mass. Finally, the trapped AVF was deflated after the capsule was opened and completely removed, approximately $9 \text{ cm} \times 5 \text{ cm} \times 5 \text{ cm}$.

The postoperative states of the patient were eventful, and his situation turned optimistic day by day. The pathological

Abbreviations: AVF, arteriovenous fistula; AVM, arteriovenous malformation; CT, computer topographic angiograph; DSA, digital subtraction angiograph; MCA, middle cerebral artery; MRI, magnetic resonance angiograph.

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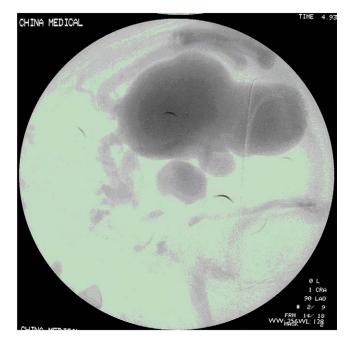


Fig. 1. The DSA examination shows the giant intracranial AVF drained to the superior sagittal sinus.

examination observed degenerated tissue of the vessel wall and proliferation of colleague. The sample is shown in Fig. 2.

No other neurological dysfunction but a slight facial palsy could be observed upon his discharge. The patient returned to normal work 3 months after operation.

2. Conclusion

Intracranial AVF more frequently occur on the dural tissue as compared with those that occur in the cortex. Arteriovenous fistula is rare in clinic, accounting for only 1.6% to 3.1% of that of cerebral AVM [3]. The most common symptoms are closely related to the hemodynamic changes of the fistulae, such as increased intracranial pressure due to the large volume of blood flow in the intracranial sinus system, exophthalmos resulting from the stealing of blood from the cavernous sinus, congestive heart failure due to the increased returned blood volume to the heart mostly in children, and so forth. In large and giant cases of fistulae,



Fig. 2. The polycystic mass was totally resected, nearly 10 cm in diameter.

however, epilepsy is more common. It mainly results from severe blood stealing from normal tissue that further leads to the ischemia and dysfunction of the brain tissue around them. Some authors even hold that intracranial AVF result from brain trauma. On the other hand, DSA is regarded as the golden criteria for the diagnosis of AVF. It can supply with the details about the feeding arteries, locations of the fistulae, and blood stealing degrees. The widely accepted treatment of AVF includes endovascular coiling, surgical resection, burning or blockage of the fistulae, or the combination of endovascular and surgical treatments. Comparing to general cases, the size of the AVF in our case is even rare, nearly 10 cm in diameter, and it has increased the difficulty of either blockage or clipping or intravascular treatment [2]. Meanwhile, this giant AVF has no history of rupture, and the only manifestation was due to the epilepsy resulting from the mass effect [1]. The patient was fortunate because the giant AVF was resected in time successfully and he has had no epilepsy onset after operation.

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