CASE REPORT

Giant Serpentine Middle Cerebral Artery Aneurysm

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Summary

A rare case of partially thrombosed giant serpentine right middle cerebral artery aneurysm presented. A 26 years old man initially presented with headache and 3 months later developed neurological deficit. Various stages of clot with patent residual lumen seen on neuroimaging, led to the diagnosis. Catheter angiography is the investigation of choice for evaluating the location, flow dynamics and extent of the serpentine aneurysm. The patient had embolisation done for the giant serpentine aneurysm.

Key Words: Giant serpentine aneurysm, Neuroimaging, Middle cerebral artery aneurysm, Embolisation

Introduction

Giant serpentine aneurysms are a subgroup of large intracranial aneurysms, which have unique presentations and radiographic features[1]. Cerebral angiography is important in establishing the presence of a giant serpentine aneurysm apart and provides excellent anatomic details. CT (Computed Tomography), MRI (Magnetic Resonance Imaging) and MR angiography (MRA) of this lesion have specific features[1]. These aneursyms can be mistaken with other mass lesions as adjacent cerebral edema and mass effect are common features on CT and MR. Its serpentine shape makes the appearance more confusing particularly on axial images. In this report, we describe a young patient with partially thrombosed giant serpentine right middle cerebral artery aneurysm with a functioning blood channel supplying part of the parietal lobe.

Case report

A 26 years old man presented with sudden onset of right temporal headache with no neurological deficit. There was spontaneous recovery of his symptoms at this point and no treatment was sought. He presented again 3 months later with similar but more severe headache associated with slurring of speech, left upper motor neuron facial nerve palsy and vomiting. No other focal neurological deficit was present. His Glasgow coma scale was full.

On CT brain, pre and post contrast enhancement showed a large heterogenous density lesion which partly enhanced at the inferior right frontal lobe at the point of distribution of the right middle cerebral artery. There was associated adjacent intraparenchymal haemorrhage (Fig.1). MR images revealed a heterogeneously enhancing lesion with perilesional oedema and adjacent intraparenchymal haematoma. A patent residual vascular lumen was present on both MRI and CT images. 3D-TOF MRA showed the presence of a serpiginous giant, partially thrombosed aneurysm with residual flow through a serpiginous lumen within the thrombosed portion (Fig.2). Repeat CT after one month clearly demonstrated a patent residual lumen within the thrombosed giant aneurysm. Cerebral angiography demonstrated a partially

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thrombosed giant aneurysm arising from the right middle cerebral artery. The serpiginous lumen filled slowly and opacified the right middle cerebral (M2) artery branches. These findings were consistent with a giant serpentine aneurysm arising at the right middle cerebral artery with distal branches supplying normal cortex. Endovascular occlusion of the giant serpentine aneurysm using superglue was done. He was discharged well without any new neurological deficit one week after endovascular treatment.

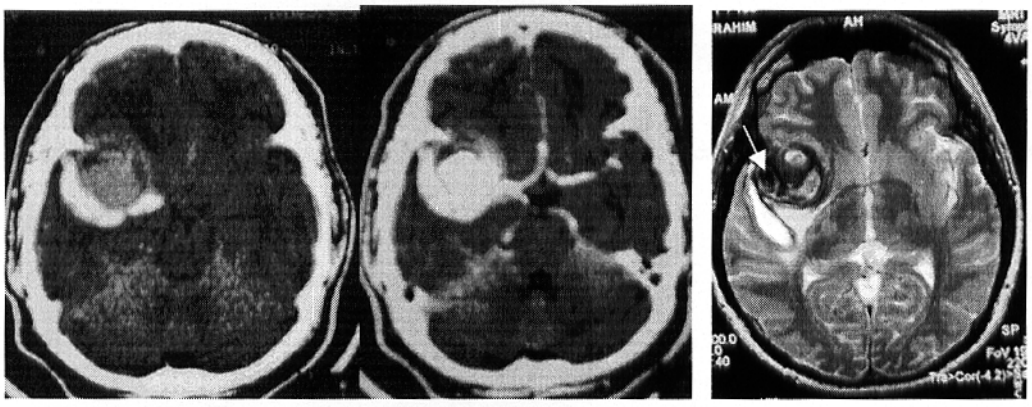

Fig 1: Pre and post contrast CT Brain showing the opacified patent slow flow lumen and thrombosed portion. Adjacent intraparenchymal haematoma noted at the posterior aspect. Signal void area (arrow) in T2W image depicts the patent residual lumen. Mixed signal intensities surrounding the lesion represented various stages of hematoma

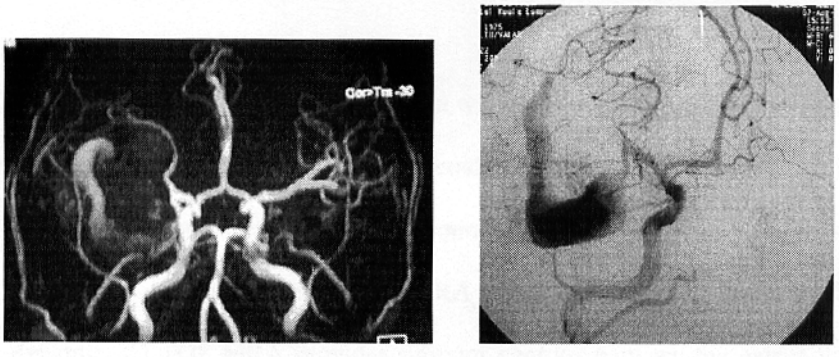

Fig 2: Normal 3D TOF MRA on the left showed the serpiginous giant aneurysm. Note that there was a lot of background T1 contamination artifact due to the blood products from the thombosed portion and adjacent haematoma. Catheter cerebral angiogram on the right, confirmed the presence of a giant serpentine aneurysm

Discussion

A giant serpentine aneurysm has been defined as a giant, partially thrombosed aneurysm (greater than 2.5 cm in diameter) with tortuous vascular channels that have a separate entrance and outflow pathway 1. Giant serpentine aneurysms usually present with signs of an intracranial mass. The predominant signs and symptoms are headache, hemiplegia, hemiparesis, visual disturbances, cranial nerves palsy, dysphasia, aphasia, nausea, vomiting, seizures and vertigo. They can also present with subarachnoid hemorrhage, but this is not common. Our patient presented initially with a headache and subsequently with an intraparenchymal hemorrhage and neurological deficit.

Non-enhanced CT scans of our patient demonstrated an oval-shaped mass of mixed density with heterogeneous regions of increased attenuation. These represented layers of various stages of clot. The tubular regions of decreased attenuation, which enhanced after contrast, represented a patent residual lumen as seen in previous cases [1]. The wall of the aneurysm may also enhance with contrast.

The MRI normally shows a mass lesion with a heterogeneous signal that represents various stages of hemoglobin degradation and flow void regions representing patent residual lumen as seen in our case. The aneurysm is clearly separated from normal parenchyma and the residual patent lumen was clearly shown by the MRA images. It has been reported that contrast enhanced dynamic 3D TOF MRA provides superior contrast between the patent flow and background. It also eliminates the T1 contamination artifact significantly [2]. However, this was not done for our patient.

Catheter angiography remains the gold standard in evaluating the location, flow dynamics and extent of the serpentine aneurysm[3]. In addition, distal microcatheterazation of the serpentine aneurysm may be required to ascertain if there are any normal distal branches as this information is important in evaluating treatment plans and options.

The treatment of giant serpentine aneurysms should aim to arrest their growth, eliminate the mass effect, and also to obliterate the abnormal vascular channel. The most effective way of accomplishing these goals is the direct and permanent occlusion of the parent artery at the origin of the aneurysm. This can be achieved by endovascularly via selective catheterization of the parent artery and occlusion of the vessel with detachable balloons, N-butylcyanoacrylate, or Guglielmi detachable coils. Surgery still plays an important role particularly for External–Internal carotid bypass. Endovascular occlusion of the parent artery should be performed after careful functional testing of the distal territory to assess any potential neurologic deficit that may ensue.

In conclusion, giant serpentine aneurysm is a specific pathologic entity that can affect the intracranial blood vessels. CT and MR should be used for non-invasive assessment. Various stages of clot with patent residual lumen are important differentiating features in neuroimaging. MRA particularly Dynamic Contrast Enhanced 3D TOF is good for evaluation of aneurysms. Cerebral angiography is diagnostic and can provide crucial information for the treatment planning including possibility of endovascular occlusion of the aneurysm, neurosurgery or combination of both.

References

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