

Kissing aneurysms at anterior communicating artery: report of an extremely rare case

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ABSTRACT

Multiple aneurysms of anterior communicating artery (AcomA) are rare and kissing aneurysms at this artery are extremely rare. They are adjacent aneurysms of different origin arteries in the same region and they require a bit of extra care in diagnosis and treatment. We report a case of kissing aneurysms at AcomA which were treated by microsurgical clipping with preoperative indocyanine green (ICG) videography.

Keywords: communicating artery, kissing aneurysms, multiple aneurysms, microsurgical clipping.

INTRODUCTION

Multiple aneurysms of anterior communicating artery (AcomA) are rare and kissing aneurysms at AcomA are extremely rare, only four cases have been reported in the literature^{1,2,3,4}. This case would be the fifth one. The term, "Kissing Aneurysms" denotes two aneurysms facing and touching each other with different origin arteries. These aneurysms are quite rare and can be found in any vascular trunk of intracranial circulation. They may pose difficulties during diagnosis and treatment. They can be treated either by clipping or coiling with excellent results. We report our experience related to this very rare entity.

CASE DESCRIPTION

A 40 year old right handed lady was admitted to the Neurosurgery Department through emergency with history of sudden onset of severe headache and vomiting since the last two days. She was a nonsmoker but hypertensive. On examination, she had Glasgow Coma Score (GCS) of 13 and Hunt and Hess clinical

grade III without neurological deficit. Urgent CT scan of the brain revealed diffuse subarachnoid hemorrhage (SAH) with Miller Fischer grade IV (Fig 1). 64-slice CT Angiogram was performed on the same day which showed two aneurysms at AcomA facing each other and originating from the junction of the right A1-A2 and left A1-A2 segments (Fig 2). Neck of right AcomA aneurysm was 3.1mm and fundus was 4.0 X 5.1mm in diameter. Neck of left AcomA aneurysm was 2.0mm and fundus was 4.3 X 2.8mm in diameter. Left AcomA aneurysm was irregular in shape, suggestive of a ruptured one. Both aneurysms were clipped via right pterional approach.

Temporary clips were applied in both A1 for 6 minutes before applying permanent clips on the necks of both the aneurysms. Intra-operative findings were suggestive of bleeding from the left AcomA aneurysm. Neck of left aneurysm was clipped first by 7.0 mm straight Sugita titanium clip and right aneurysm was clipped by 5.0 mm right angled fenestrated clip. Prior to applying clips, both fundi were separated from each

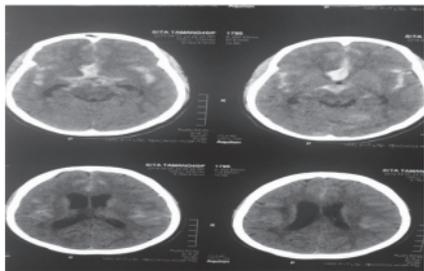


Fig.1 CT Scan of brain showing diffuse SAH with clot in anterior interhemispheric fissure

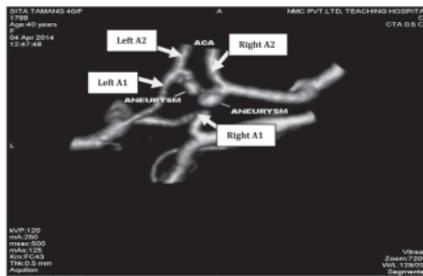


Fig.2 Preoperative 3D CT cerebral angiogram depicting two kissing aneurysms at anterior communicating artery

other by sharp dissection (Fig 3).

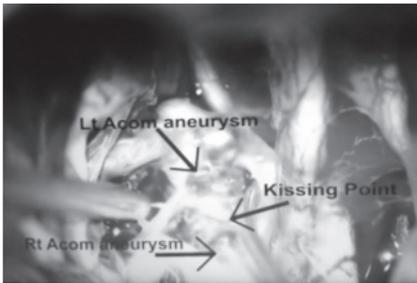


Fig.3 Per operative microscopic picture showing two aneurysms at anterior communicating artery facing and kissing each other

Per-operative ICG videography was performed before and after clipping of the necks. Per-operative period was uneventful. Postoperatively, the patient improved very well and she was discharged on the 14th postoperative day with Glasgow Outcome Score (GOS) of five. Postoperative CT angiogram showed total occlusion of the neck of both the aneurysms (Fig 4).

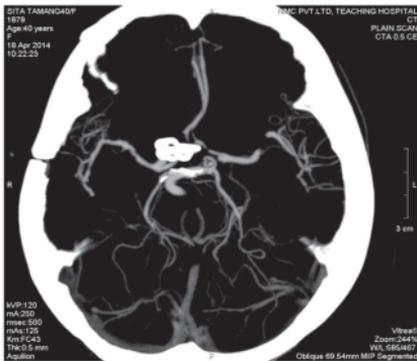


Fig.4 Post operative CT Angiogram depicting complete occlusion of necks of both aneurysms at anterior communicating artery with microsurgical clips in situ.

DISCUSSION

Kissing aneurysms are rare types of multiple aneurysms. They are two aneurysms facing and touching each other of different origins in the region. These aneurysms are quite rare and an incidence of 0.2% was reported by Yasargil (two kissing aneurysms out of his 1012 aneurysm cases)⁵. These kissing aneurysms at the middle cerebral artery bifurcation, ophthalmic segment, internal carotid artery, basilar fenestration, posterior communicating artery and anterior communicating artery have been described in literature⁶⁻¹⁴.

Kissing aneurysms at AcomA are extremely rare and only four cases have been reported and this case would be the fifth one.¹⁻⁴ Although, conventional cerebral angiogram is the gold standard to diagnose any intracranial aneurysms including kissing aneurysms but they are often misinterpreted as the bleb of an aneurysmal sac or a single multilobulated aneurysm. Harada *et al* reviewed 23 cases in literature and found that 13 (57%) had not been recognized as kissing aneurysms preoperatively⁷. In our case, we did 64 slices CT angiogram with 3D images and we could make a diagnosis of kissing aneurysms at AcomA preoperatively.

Thus, additional 3-dimensional CT angiography, rotational DSA may be useful in their diagnosis¹⁵. There are two modalities of effective treatment of kissing aneurysms like other intracranial aneurysms. They are microsurgical clipping and endovascular coiling and both procedures had excellent results as reported previously (Table 1).

Surgical clipping is the standard treatment for kissing aneurysms to occlude the neck permanently and prevent rebleeding. Two cases of kissing aneurysms at AcomA, which were clipped successfully have been reported.¹⁻⁴ However, during surgery there is a high risk of rupture due to dense adhesions between kissing aneurysms, the need to apply at-least two clips in a narrow working area and the application of the second clip may be difficult due to interference from the first clip.

Moreover, in case of SAH, it is difficult to determine which aneurysm has bled and, which should be clipped first. If neck of an unruptured aneurysm is clipped

Table 1: Reported cases of kissing aneurysms at communicating artery

Authors/year	Age/Sex	Presentation	Treatment	Outcome
Wanifuchi <i>et al</i> , 2001	45/M	SAH	Both clipped	Good recovery
Matsumoto <i>et al</i> , 2005	48/M	SAH	One coiled and one clipped	Good recovery
Suh <i>et al</i> , 2008	56/M	SAH	Both coiled	Good recovery
Baldawa <i>et al</i> , 20011	63/M	SAH	Both clipped	Good recovery

first, traction on the other ruptured one may occur, causing premature secondary rupture. In our case, we first applied temporary clips on both A1 segments and after the dissection of the neck and sac we clipped the ruptured one first followed by the right unruptured one to avoid intraoperative rupture. Endovascular coiling is another treatment option for these kissing aneurysms¹⁶. Two cases of kissing aneurysms at AcomA which were treated by coiling have been reported.^{2,3} Endovascular treatments of kissing aneurysms have some advantages as compared with neck clipping. It can reduce the risk of open surgery, premature rupture during dissection and brain injury during retraction. However, there are some limitations to endovascular treatment of kissing aneurysms. If the aneurysm on the opposite side ruptures during coiling, it is very difficult to control the bleeding immediately. If necks are broad or domes are small they might be unsuitable for coiling.

In our case, we chose microsurgical clipping which is equally safe and because facility of endovascular coiling is not available in our setup. Kissing aneurysms at AcomA are extremely rare and that requires caution in diagnosis and treatment.

During clipping of these aneurysms two points should be kept in mind: Firstly that premature rupture of the aneurysm can occur while separating kissing points of two aneurysms due to dense adhesions between them and secondly it might be difficult to apply a clip on the neck of the second aneurysm due to limited space and hindrance by the first clip.

PATIENT CONSENT

Written, informed consent was obtained for submission of the case report for publication purposes.

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