

Case Report

Endovascular Treatment of "Kissing Aneurysms" at the Anterior Communicating Artery

Sang Jun Suh, M.D.¹, Dong Gee Kang, M.D.¹, Kee Young Ryu, M.D.¹, Jae Hoon Cho, M.D.²

Department of Neurosurgery¹, Daegu Fatima Hospital, Daegu, Korea

Department of Neurosurgery², Kosin University Gospel Hospital, Busan, Korea

Kissing aneurysms are the rare type of multiple aneurysms. They are adjacent aneurysms of different origin arteries in the same region, which require great care in diagnosis and treatment. We report a case of kissing aneurysms at the anterior communicating artery (AcomA) which were treated by endovascular coil embolization.

KEY WORDS : Kissing aneurysms · Subarachnoid hemorrhage · Coil embolization.

INTRODUCTION

Kissing aneurysms can be defined as two anatomically adjacent aneurysms of different origin arteries, with the walls partially, pressed together^{1,2,6,8,9,11}. In the circle of Willis, these aneurysms are quite rare and 0.2% incidence was reported by Yasargil². These kissing aneurysms have been treated either with separate neck clipping^{1,2,6,9,11}, or endovascular treatment^{3,7,8,10}.

We report a case of subarachnoid hemorrhage (SAH) due to kissing aneurysms of AcomA that were treated by endovascular coil embolization successfully.

CASE REPORT

A 56-year-old male visited our hospital after sudden headache. On admission, he had no neurologic deficits. Initial computed tomography (CT) showed diffuse hyperdense hemorrhagic lesion on subarachnoid space, classified as Fisher grade 3. Conventional angiography and 3-dimension rotational angiography (3DRA) showed two aneurysms at both junctions of AcomA and another aneurysm at left internal carotid artery (ICA) bifurcation (Fig. 1). SAH was considered by rupture of one of both AcomA aneurysms. Two aneurysms of AcomA were shown to be

overlapped on lateral angiographic view (Fig. 1C) and these aneurysms were well defined as two separated aneurysms on antero-posterior angiographic view (Fig. 1A, B) and 3DRA (Fig. 1D, E). Because these aneurysms had narrow necks and good configurations for coil embolization, we chose endovascular treatment as first option.

Under general anesthesia, two 7F sheaths were inserted in the both femoral arteries. A 6F guiding catheter (Envoy, Cordis, USA) was placed in the left ICA and a 2.4F microcatheter (Excelsior SL-10, Boston Scientific, USA) with 1.7F distal tip was placed within the left side AcomA aneurysm sac using a microguide wire (SYNCHRO 14, Boston Scientific, USA) (Fig. 2A). Through another femoral sheath catheter, 5F angiocatheter was navigated into right ICA under continuous heparin flushing. The left AcomA aneurysm was filled with detachable coils (GDC-10, Boston Scientific, USA and Microflex-10 helical type, Microvention Terumo, Japan) (Fig. 2B). There was no contrast leakage via right AcomA aneurysm or thromboembolic event. Thereafter, coil embolization for the right side AcomA aneurysm was done without difficulty (Fig. 2C, D). After embolization, follow-up angiography showed successful embolization on two aneurysms and well-defined AcomA flow and distal anterior cerebral artery (ACA) flow.

The left ICA bifurcation aneurysm was not treated with endovascular treatment because it was small for coiling. Two weeks later, neck clipping of this aneurysm was done. There was no evidence of rupture from this aneurysm on operative field. Follow-up angiography 4 weeks later revealed complete occlusion of kissing aneurysms at AcomA and no

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• Address for reprints : Jae Hoon Cho, M.D.

Department of Neurosurgery, Kosin University Gospel Hospital,
34 Amnam-dong, Seo-gu, Busan 602-702, Korea

Tel : +82-51-990-6465, Fax : +82-51-990-3042

E-mail : fhjcho@yahoo.co.kr

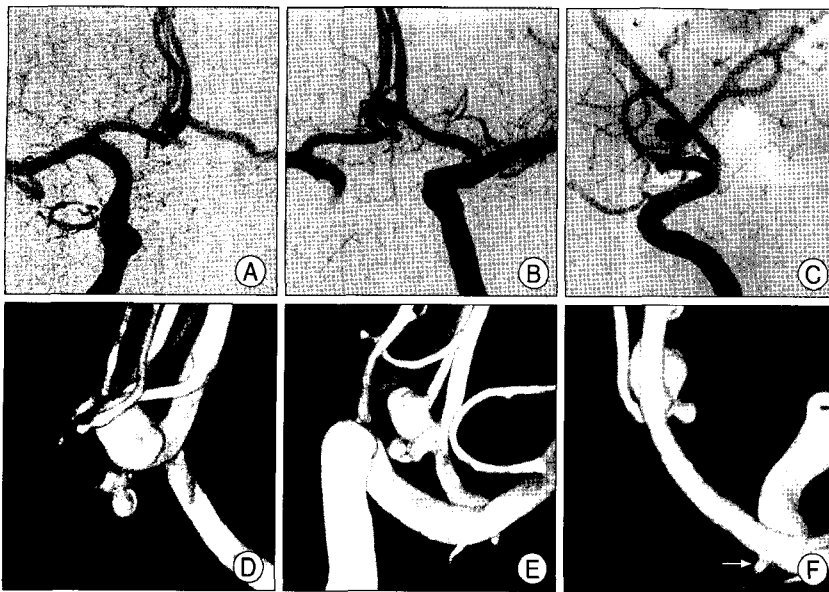


Fig. 1. Two aneurysms in anterior communicating artery are showed on initial conventional angiography (A : angiography via right internal carotid artery, B : via left internal carotid artery, C : lateral view). Right anterior communicating artery aneurysm size is 1.8 × 2.1 × 2.1 mm, protruding into medioinferior direction (D). Left anterior communicating artery aneurysm size is 3.3 × 5.0 × 4.1 mm, protruding into anterosuperior direction (E). Also, left internal carotid artery bifurcation aneurysm size is 1.2 × 1.5 × 1.0 mm (F-white arrow).

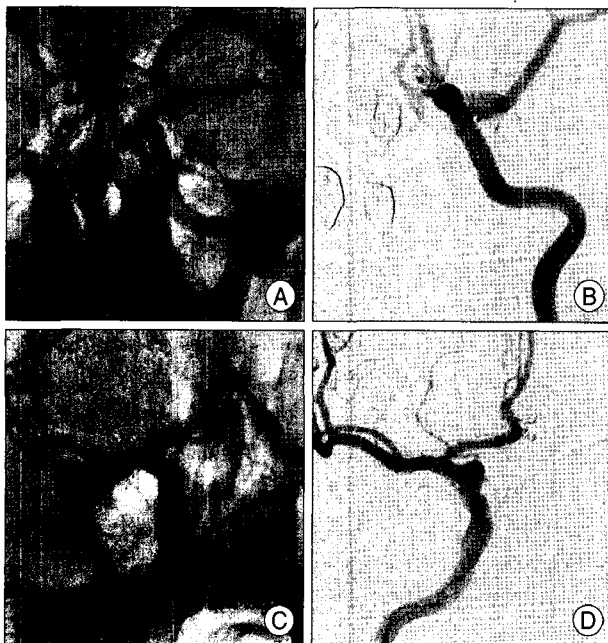


Fig. 2. During endovascular embolization, left anterior communicating artery aneurysm is filled with detachable coils via left internal carotid artery (A, B). After then, right anterior communicating artery aneurysm is filled with detachable coils via right internal carotid artery (C, D).

residual sac of clipped left ICA bifurcation aneurysm (Fig. 3). He was discharged without any neurologic deficit.

DISCUSSION

Kissing aneurysms are known as a rare type of multiple aneurysms. In previous studies, Jefferson described “double

aneurysms” on single lesion⁴⁾. After this, several authors used term “kissing aneurysms” as adjacent aneurysms of different origin arteries^{1,2,6,8-11)}. Yasargil reported the incidence of kissing aneurysms as only 2 (0.2%) in 1,012 patients¹²⁾. In early studies, kissing aneurysms were located in ICA, AcomA, distal ACA and vertebrabasililar artery. They had some difficulties in diagnosis, because it was often misunderstood as bleb of aneurysmal sac or multilocular sac. Also, they may have missed diagnosis through overlapped sac lesions on angiography. In our case, we used conventional angiography and 3DRA. It was useful to diagnose of kissing aneurysms, their origin artery, size, and direction.

Neck clipping is a traditionally standard treatment modality for ordinary

aneurysms, but great caution is required in the treatment of peculiar kissing aneurysms. Because there is not enough space around the aneurysmal neck than solitary aneurysm and it is difficult to determine which aneurysm has bled, and which should be clipped first, the potential for premature rupture may be higher than ordinary aneurysm^{1,2,6,11)}. Magnetic resonance angiography, 3-dimensional CT, and 3DRA are useful in the diagnosis of kissing aneurysms and/or in the detection of kissing point and ruptured point. If surgical clipping is scheduled, neurosurgeons must decide which aneurysm should be clipped first.

Recently, endovascular coil embolization was developed to alternative treatment for aneurysms. To our knowledge 2 cases with kissing aneurysms at AcomA have been reported, one is treated by surgical clipping¹¹⁾ and the other by endovascular coiling⁸⁾. In a case of AcomA kissing aneurysms that were treated by endovascular coiling, the authors did not diagnose the kissing aneurysms before first coil embolization⁸⁾. With the aid of 3DRA, we more clearly recognized the relationship between the kissing aneurysms and AcomA. It was difficult to judge the ruptured aneurysm by the appearance of SAH. We concluded that the left AcomA aneurysm has ruptured because of the appearance(with a small bleb) and size(larger than right AcomA aneurysm). We selected endovascular coiling as treatment modality because of favorable direction and shape of the aneurysms for coiling and surgical risks. Our aneurysms had obtuse angles to parent arteries and narrow necks.

Endovascular treatment of kissing aneurysms have some

advantages compared with neck clipping. It can reduce the risk of open surgery, premature rupture during dissection, and brain injury during retraction for making adequate operative field. Kissing aneurysms are close together from another origin artery in narrow space. It has difficulty in exposing the neck in narrow working space. We believe that endovascular coil embolization is useful for the treatment of kissing aneurysms for the protection against premature rupture and brain injury.

However, there are some limitations to endovascular treatment of kissing aneurysms. If aneurysm on opposite side ruptures during coiling, it is very difficult to control the bleeding immediately⁸⁾.

In our case, the shape and direction of kissing aneurysms were suitable for endovascular coil embolization. There were no significant problems during embolization or postoperative vascular complications.

CONCLUSION

Kissing aneurysms are rare type of multiple aneurysms. Surgical treatment for these aneurysms requires great caution because of possibility of premature rupture. We experienced a case of kissing aneurysms at AcomA that were treated with endovascular coiling without any sequelae. Endovascular treatment for kissing aneurysms is considered as a good treatment modality having more advantages than open surgery, especially in ruptured case.

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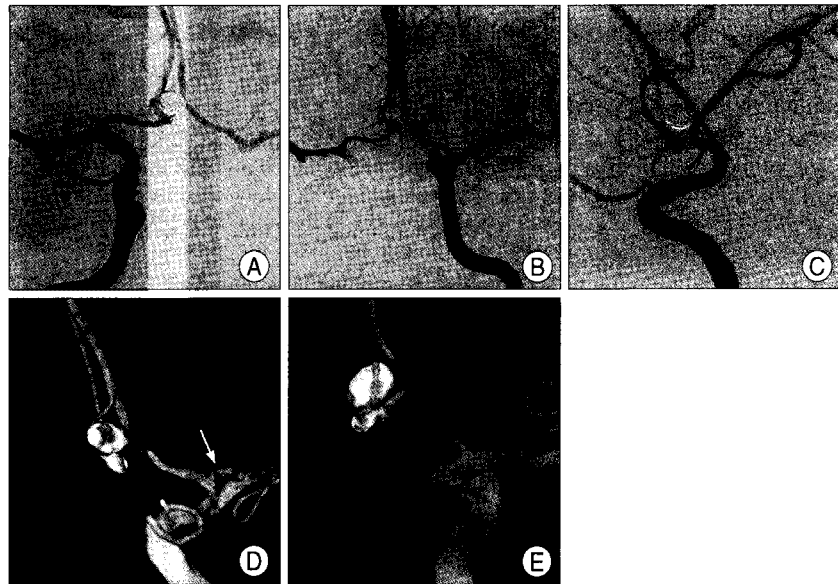


Fig. 3. Follow-up angiography done after 4 weeks showing a complete occlusion of both anterior communicating artery aneurysm (A : angiography via right internal carotid artery, B : via left internal carotid artery, C : lateral view, D, E : 3-dimension rotational angiography). Also, there is no residual sac of clipped left internal carotid artery bifurcation aneurysm (D-white arrow : clip).

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