Bilateral Ophthalmic Segment “Kissing” Aneurysms Presenting With Subarachnoid Hemorrhage
—Case Report—

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Abstract
A 31-year-old woman presented with bilateral ophthalmic segment “kissing” aneurysms causing subarachnoid hemorrhage manifesting as sudden severe headache and nausea 3 days before admission. Cerebral angiography demonstrated bilateral internal carotid-superior hypophyseal artery aneurysms, both projecting medially from the medial surface of the internal carotid arteries and appearing to touch each other. Both aneurysms had to be clipped in the same operation, because of uncertainty over which aneurysm had bled. She underwent bilateral frontotemporal craniotomy on the day after admission. Intraoperatively, the two aneurysms were in contact with each other in the suprasellar cistern. Each aneurysm was clipped through the ipsilateral approach without any incident. The patient returned home a month after the operation and has since resumed her previous work. Identification of this rare entity of bilateral ophthalmic segment “kissing” aneurysms is important for surgical planning. Closely situated, bilateral ophthalmic segment aneurysms require a modified surgical strategy for proximal arterial control and the approach to each aneurysm.

Key words: kissing aneurysm, internal carotid artery aneurysm, superior hypophyseal artery aneurysm, subarachnoid hemorrhage

Introduction
Ophthalmic segment aneurysms account for 3.3–11% of intracranial aneurysms.2,13) Bilateral ophthalmic segment aneurysms are not particularly rare, as 10% to 21% of patients with an ophthalmic segment aneurysm also had a contralateral ophthalmic lesion in large series.2,3,13) However, bilateral ophthalmic segment aneurysms touching each other (kissing aneurysms) are extremely rare, with only one previous case of unruptured, large bilateral ophthalmic segment “kissing” aneurysms.1) Here, we report a case of bilateral ophthalmic segment “kissing” aneurysms manifesting as subarachnoid hemorrhage. The closely situated, bilateral aneurysms necessitated a modified surgical strategy and had to be clipped concurrently, because it was not possible to determine which aneurysm had bled.

Case Report
A 31-year-old woman had been in good health until October 24, 1999, when she suddenly suffered severe headache and nausea. She immediately visited a local hospital. The diagnosis was migraine. She came to our facility 3 days after the onset of headache. On admission, she complained of headache. Neurological examination found nuchal stiffness. Computed tomography showed no abnormalities, but lumbar puncture revealed bloody cerebrospinal fluid (CSF) and centrifugation of the CSF showed xanthochromia. The diagnosis was subarachnoid hemorrhage. She was alert, fully oriented, and exhibited no focal neurological deficits. She was nearsighted but without obvious visual field defect. Cerebral angiography demonstrated bilateral internal carotid artery aneurysms (Fig. 1). The aneurysms projected medially from the medial surfaces of the internal carotid arteries opposite and slightly distal to the ophthalmic artery origin. The two aneurysms were apparently in contact. The maximal aneurysm diameter was 8 mm on the right and 15 mm on the left.
Neck clipping of both aneurysms was performed on the day after admission. Both internal carotid arteries were exposed in the neck and temporary tapes were placed around the arteries. A large bilateral frontotemporal craniotomy was then performed following coronal skin incision. The dura was initially incised on both sides so that both lesions could be explored from either side. A thin subdural clot was identified in the frontal base. A subarachnoid clot was localized in the chiasmatic cistern. The two aneurysms touched each other in the suprasellar cistern (Fig. 2). Neither the chiasm nor the optic nerves were displaced. Although which aneurysm had bled was unclear, the larger left lesion was first explored through a left lateral frontobasal approach. The left optic canal and anterior clinoid process were drilled to facilitate optic nerve mobilization. The neck of the aneurysm was situated on the inferomedial aspect of the internal carotid artery opposite the ophthalmic artery origin. An L-shaped aneurysm clip (Sugita No. 21) was applied to the neck of the aneurysm.

As expected, the neck of the contralateral aneurysm was difficult to explore through a left frontobasal approach, because the neck was situated beneath the right optic nerve in this operative view. Therefore, the patient’s head was rotated to the left and the right lesion was approached ipsilaterally. After drilling the posterior end of the optic canal and the medial part of the anterior clinoid process, the neck of the aneurysm was easily identified on the inferomedical aspect of the right carotid artery. The aneurysm was obliterated with a curved clip (Sugita No. 8). After clipping, both aneurysms were punctured and collapsed but neither superior hypophyseal artery was identifiable. The aneurysm domes were broadly adherent to each other near the midline. The aneurysm responsible for the subarachnoid hemorrhage could not be identified.

The postoperative course was uneventful and cerebral angiography showed obliteration of both aneurysms (Fig. 3). She returned home a month after the operation and has since resumed her previous daily activities.
work.

Discussion

Kissing aneurysms can be defined as two anatomically adjacent aneurysms with separate origins and partially adherent walls.7) Kissing aneurysms are rare in large series of multiple aneurysms. Eight studies have described kissing aneurysms.1,5–8,11–13) The ipsilateral internal carotid artery is the most common origin of kissing aneurysms. The detailed clinical features of kissing aneurysms have recently been reviewed elsewhere.11)

A review of large series of ophthalmic segment aneurysms revealed several characteristics.2,3,13) These aneurysms occur predominantly in women, and are frequently associated with aneurysms at other sites, including symmetrical carotid-ophthalmic artery aneurysms. Bilateral ophthalmic segment aneurysms are not particularly rare. Eight of 80 patients with one ophthalmic segment aneurysm also had a contralateral ophthalmic lesion,2) and seven of 33 carotid-ophthalmic artery aneurysms were bilaterally symmetrical.13) However, bilateral ophthalmic segment aneurysms touching each other are extremely rare. Only one previous case of unruptured, bilateral ophthalmic segment “kissing” aneurysms underwent clipping in a two-staged operation.1) Both aneurysms in the present case were considered to be superior hypophyseal artery aneurysms (suprasellar variant), according to the classification of Day.2) Superior hypophyseal artery aneurysms arise just above the dural ring from the medial bend of the internal carotid artery, at the origin of the perforator to the superior aspect of the hypophysis, and have no direct association with the ophthalmic artery.2)

The operative plan in our case was complicated by the presence of the bilateral aneurysms and the inability to ascertain which aneurysm was responsible for the subarachnoid hemorrhage. Closely situated, bilateral ophthalmic segment aneurysms require a modified surgical strategy in terms of proximal arterial control and the side of approach. The two aneurysms had to be clipped in the same operation, because of the uncertainty over which aneurysm had bled. The difficulty in clipping these aneurysms is attributable to the two aneurysms originating from different internal carotid arteries. Both aneurysms were clipped without incident. However, if premature rupture had occurred, it would have been difficult to determine which aneurysm was bleeding, because the major parts of both aneurysms were situated beneath the optic nerves and chiasm. Moreover, proximal arterial control would not necessarily be feasible with an intracranial procedure. Therefore, both proximal internal carotid arteries in the neck were prepared before craniotomy for possible transient occlusion in the event of premature rupture. Bilateral craniotomy was chosen to assure that both aneurysms and both internal carotid arteries distal to the aneurysms could be manipulated from either side in the event of difficulty.

The contralateral approach is useful for medially-projecting, relatively small ophthalmic segment aneurysms.4,8,10) However, superior hypophyseal artery aneurysms are often more difficult than ophthalmic artery lesions to visualize from a contralateral approach.21) Clipping of large aneurysms from the contralateral side is not recommended except in emergency situations.21) In our experience, small superior hypophyseal artery aneurysms can be clipped through the prechiasmatic space from the contralateral side. However, both aneurysms in the present case were clipped via an ipsilateral approach because neither aneurysm could be explored from the contralateral side due to the overlying optic nerves and the chiasm.

References

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