Mycotic aneurysms of the internal carotid artery

Case report

SATOSHI SHIBUYA, M.D., SEISHI IGARASHI, M.D., TADASHI AMO, M.D., HIDEO SATO, M.D., AND TARO FUKUMITSU, M.D.

Department of Neurosurgery, Shizuoka Rosai Hospital, Hamamatsu, Japan

The authors report a case with two mycotic aneurysms in the cavernous portion of the internal carotid artery, presumably secondary to a transient bacteremia from pneumonia. The strikingly rapid development of the aneurysms was demonstrated by angiography. Painful total opthalmoplegia and exophthalmos were the main clinical features.

KEY WORDS • mycotic aneurysm • total opthalmoplegia • cavernous sinus

INTRACRANIAL mycotic aneurysms of extra-vascular origin are rare, and a multiple incidence is particularly unusual. We have been able to find reports of only seven cases of aneurysm of the intracavernous portion of the internal carotid artery secondary to infection in the cavernous sinus.

We are reporting a case of multiple mycotic aneurysms with angiographic evidence of rapid development in size in only 10 days. Such manifest angiographic demonstration has not been reported previously.

Case Report

A 42-year-old woman was admitted to hospital on January 29, 1973, with chest pains in the right side, after a prolonged and complicated illness characterized by headache and fever. She had no previous documented history of pulmonary disease or cardiac abnormalities.

Examination. On admission, the patient was drowsy and complained of severe headache and chest pains. She had a moderately stiff neck, nystagmus to the left, and flaccid tendon reflexes of the extremities. Blood pressure was 140/92, pulse 96, temperature 98.8°F, and white blood cell count 20,600. Lumbar puncture revealed an opening pressure of 180 mm H2O. Examination of the spinal fluid showed 65 white blood cells, while sugar and protein amounts were within normal limits. Chest x-ray films showed a homogenous density increase in the right lower lobe. Blood cultures grew staphylococcus, so antibiotic therapy was started with penicillin and chloramphenicol.

On the fourth day in hospital, the patient complained of retro-orbital pain and tinnitus...
in the left side, and a mild left blepharoptosis was found. Within a week the patient had developed inflammatory swelling of the left infra-auricular region. The left eyelids were edematous, the eyeball protruded and lateral ocular movements were restricted. No bruit was audible over either eye. A left carotid angiography on February 5 revealed a saccular and a cylindrical aneurysm in the intracavernous part of the internal carotid artery (Fig. 1). The carotid siphon was of a caliber less than average, suggesting the presence of arterial spasm. On the 16th hospital day, the patient had a total left ophthalmoplegia, with complete ptosis and an enlarged fixed pupil. She developed mild facial palsy on the left, and sensory impairment over the second and third divisions of the left fifth nerve. Corneal reflex on the left was also reduced. On February 15, a second left carotid arteriogram was performed (Fig. 2); the two aneurysms had increased in size over a period of 10 days. There was marked arterial narrowing of the supraclinoid portion of the carotid siphon and very poor opacification of the distal internal carotid branches, due to spasm.

Operation. On February 16, we carried out ligations of the left internal and external carotid arteries in the neck, and intracranial ligation of the ipsilateral internal carotid artery above the cavernous sinus. The left cavernous sinus was ballooned, causing a depression and a flattening of the left third nerve with mild inflammation, but no abscess formation. On extradural exploration of the foramen ovale at the base of the skull, no conspicuous inflammatory foci were disclosed.

Postoperative Course. Postoperatively the patient remained lethargic for a week. She then slowly improved, the protrusion of the eyeball diminished, and some ocular movement returned. The ligations of the carotid artery did not produce any recognizable neurological deficits. Postoperative four-vessel angiography demonstrated no remaining aneurysm. A year after the operation the patient was almost fully recovered, although mild limitation of left ocular movement to the left persisted.

Discussion
In this patient, fever and subsequent total ophthalmoplegia were the main symptoms, and a diagnosis of infective cavernous sinus syndrome was considered. In the early stages, it was difficult to determine whether the inability to move the eye and the eyelids was due to mechanical compression by the
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FIG. 2. Repeat left carotid angiogram 10 days later, showing the strikingly rapid development of the two aneurysms (arrows).

aneurysms or to inflammatory involvement of the cavernous sinus. The most probable cause for aneurysmal formation was a secondary transient bacteremia from pneumonia. It seemed likely that bacterial infection invaded the left cavernous sinus from neighboring inflammatory foci, particularly a petrosal inflammation. The carotid angiitis, of extravascular origin, might cause disintegration of the tissue until the vessel wall was weakened enough to yield to mycotic aneurysm. Another possible cause is an infective microembolus in the vasa vasorum, but our patient never showed any evidence of embolism, so this is unlikely.

Hannesson and Sachs stated that only organisms of relatively low virulence or attenuated by antibiotic therapy were capable of forming an aneurysm. They thought that such a complication might become more frequent in the future. In this case, blood cultures taken at the time of admission were positive for staphylococcus and culture from the left tympanic paracentesis revealed the same low-virulence bacterial flora.

On repeat angiography, the strikingly rapid development of aneurysms was noted. Both aneurysms had increased three to five times their size in only 10 days. Such manifest angiographic evidence of rapid aneurysm growth has not been reported previously. With the aneurysms expanding so rapidly, early surgical attack was indicated. Ligations of the carotid artery in the neck and intracranially were the preferred treatment, as the patient's cerebrovascular system was capable of supplying the necessary cross-flow from the contralateral carotid artery.

References
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Address reprint requests to: Satoshi Shibuya, M.D., Department of Neurosurgery, Shizuoka Rosai Hospital, Hamamatsu, Japan.