

MULTIPLE MYCOTIC ANEURYSMS OF INTERNAL
CAROTID ARTERIES CAUSED BY
OSTEOMYELITIS OF SKULL

Report of a case

BY

Kikuo OHNO, Umeo ITO, Yoshiharu FUKUSHIMA
and Yutaka INABA*¹

ABSTRACT

We presented a case with multiple mycotic aneurysms of the internal carotid arteries, which were located in the carotid canals and on the base of the skull and considered to be caused by osteomyelitis of the skull, namely extravascular in origin.

Carotid angiography showed seven saccular aneurysms with an irregular contour, which were stalked or sessile, one in the right and two in the left at the cavernous portion and two at the canal portion on both sides.

No literature was found on the study on the multiple mycotic aneurysms of extravascular origin, located at these portions.

Based on the clinical course, the location and multiplicity of the aneurysms, we concluded that thrombophlebitis of the diploic veins and cavernous sinuses occurred secondary to the osteomyelitis of the skull and the microorganisms were transferred into the venous plexuses of the carotid canals by way of the venous system bilaterally, developing the aneurysms of extravascular origin.

INTRODUCTION

Since Church in 1869 first reported on the causal relationship between the formation of intracranial aneurysms and vegetative endocarditis and Osler in 1885 first called these aneurysms mycotic, numerous cases have been reported. On the other hand, aneurysms of the internal carotid artery caused by extravascular infection have been rarely reported. We experienced a case with mycotic aneurysms considered as extravascular in origin, which were multiple bilaterally and located at the portion of the carotid canals and the base of the skull, developing in the course of the osteomyelitis of the skull.

*¹ 大野喜久郎, 伊藤梅男, 福島義治, 稲葉 穰: Department of Neurosurgery (Chief: Prof. Y. INABA), School of Medicine, Tokyo Medical and Dental University (Tokyo Ika Shika Daigaku).

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We will discuss about the formation of these aneurysms, mainly based on its clinical course and findings in the cerebral angiograms.

CASE REPORT

A 14-year old boy, a student, visited our clinic with a chief complaint of double vision on the 5th of January, 1972. Family history showed nothing in particular. In the summer of 1970, he suffered from left otitis media, and a slight fever continued from November 1970 to March 1971. On August 17, he was struck in the left frontal region of the head and 6 days after high fever, severe headache and swelling in the frontal region developed. On August 25, he was admitted to a hospital in a confused state and was given chemotherapy. Five days later, abscesses were found at four regions of the head and a mixture of clot and pus was removed by excision. At the same time there was left otorrhea, and the diagnosis was otitis media. Culture of the pus from both parts showed *Staphylococcus aureus*. From September 3, swelling of the eyelids and bilateral exophthalmos became prominent, and a diagnosis of secondary glaucoma was made. September 30, lumbar puncture showed an initial pressure of 250 mmH₂O with 155 mg/dl of protein and 1043/3 cells/mm³, the diagnosis being meningitis.

In October, with the improvement in the general state, his consciousness became clear, but diplopia was noticed. During the late period of October, fragments of bone were removed from fistulas of the head. On January 2, 1972 there was a mild syncope and he was admitted to our clinic on the 29th of February.

Examination His constitution was medium and consciousness was clear. Body temperature was also normal. Blood pressure was 132/78. Neurological examination revealed right anosmia, mild nystagmus, lateral deviation of the left eye, mild choked disc with V. S. and V. D. 0.05 (1.0) and loss of indirect and direct light reflex on the left side. There was a slight hypoesthesia in the area of the distribution of the 1st and 2nd branches of the left trigeminal nerve but the corneal reflex was normal. Hyperactivity of the deep tendon reflex of both upper and lower extremities was present. There were no pathological reflex, motor and sensory disturbance of the extremities, disturbance of coordination and extrapyramidal signs. Lumbar puncture was normal. Erythrocyte sedimentation rate showed 33 mm at one hour and the number of white blood corpuscles was 10,800. Electroencephalography revealed α -asymmetry in the parieto-occipital region. Serum examination showed an albumin-globulin ratio of 0.6 and 27.2 KA unit of alkalinephosphatase.



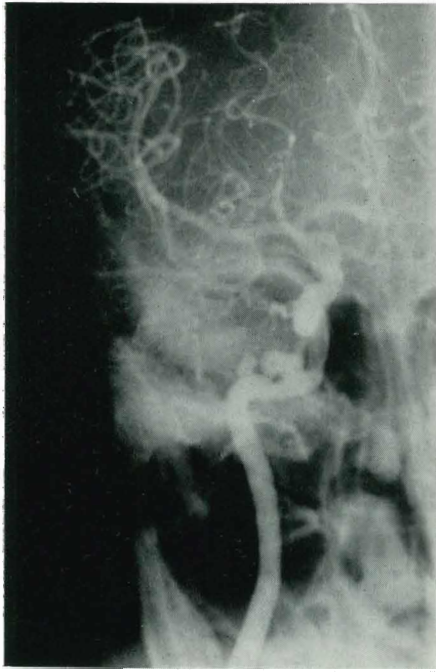
Fig. 1.: Plain A-P view
irregular macular spots of the
skull from the frontal to the
parietal region.



Fig. 2.: Plain basal view
bilateral enlargement and de-
formities of the foramen lac-
erum and the foramen rotun-
dum.

X-ray films revealed the following findings. Plain A-P view: irregular macular spots of the skull from the frontal to the parietal region (Fig. 1). Plain basal view: bilateral enlargement and deformities of the foramen lacerum and the foramen rotundum (Fig. 2). Left brachial angiography: no abnormal findings. Carotid angiography: seven saccular aneurysms with an irregular contour which were broad-based or stalked, one in the right and two in the left at the cavernous portion and two in the canal portion on both sides (Figs. 3 and 4). The distribution of these aneurysms is illustrated in Fig. 5.

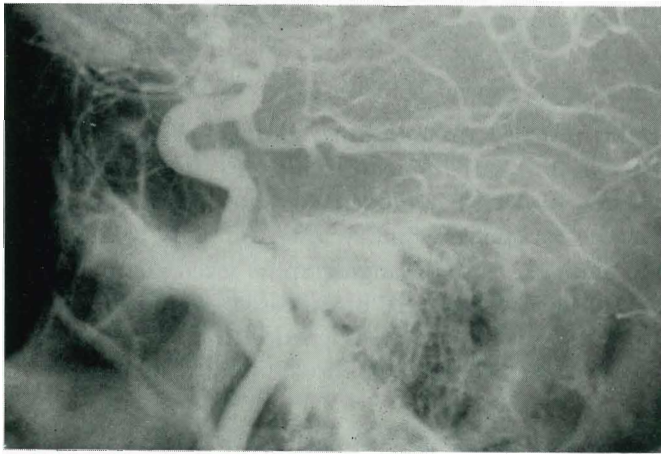
Hospital course After we diagnosed this case as osteomyelitis of the skull and mycotic aneurysms and considered the causal relationship between them, based on the clinical course and the radiological findings, antibiotic therapy was performed. Though it was impossible to treat the aneurysms themselves radically, slight improvement of double vision was obtained and ESR and leucocytosis decreased to the normal range. During this period attacks of loss of consciousness were not seen.



A.



C.



B.

Fig. 3.: Left carotid angiograms A. B. C. two at the cavernous portion and two at the canal portion of the left internal carotid artery.

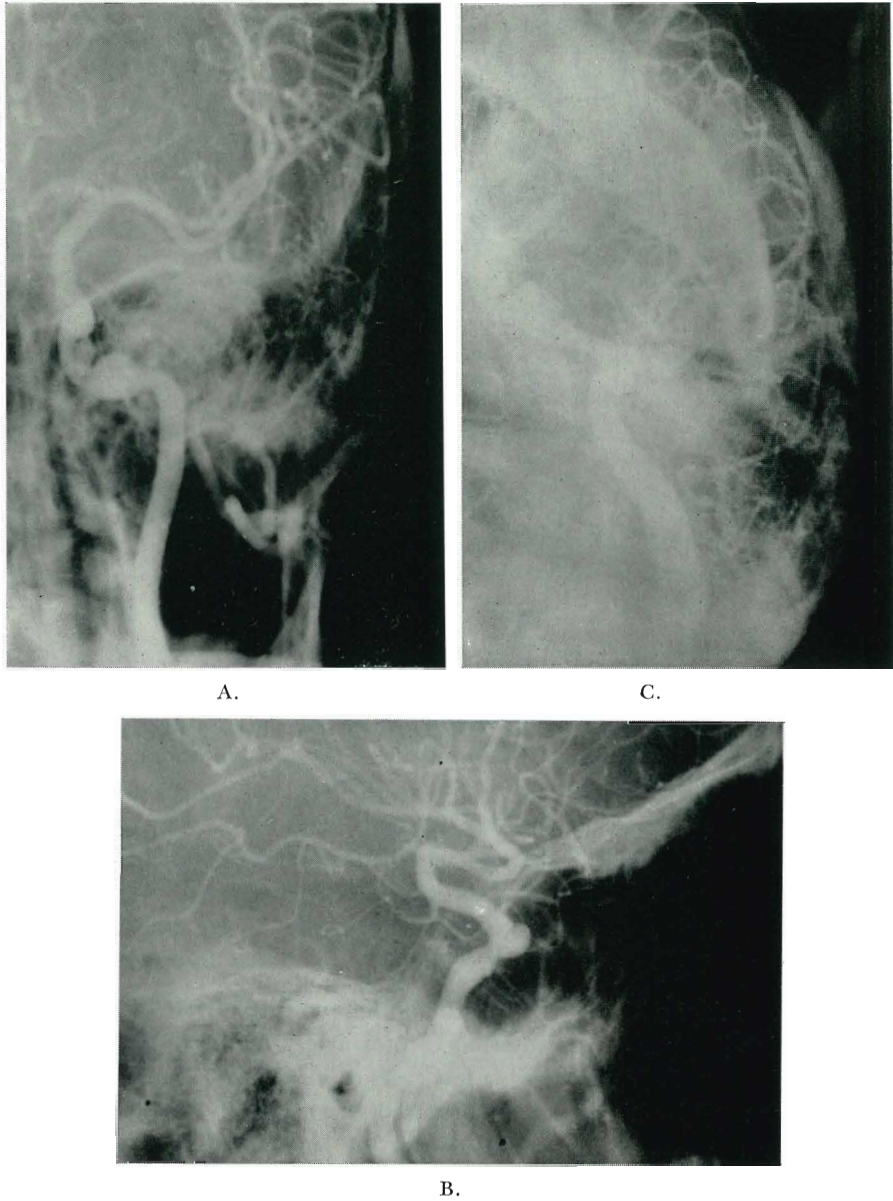


Fig. 4.: Right carotid angiograms A. B. C.
one at the knee of the siphon and two at the canal portion of the right
internal carotid artery.

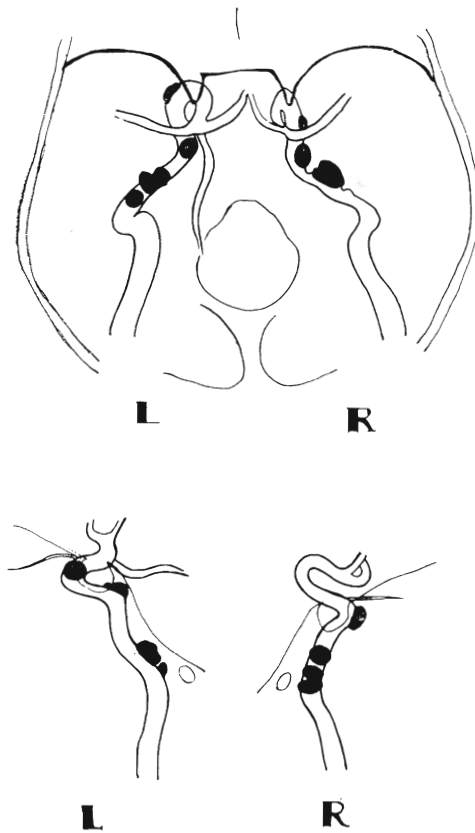


Fig. 5.: Distribution of aneurysms
three in the right side and four in the left side.

DISCUSSION

In those days without effective chemotherapy, there were a few reports on mycotic aneurysm of the internal carotid artery in the cervical portion. In these days, on the other hand, a few cases of intradural aneurysms caused by purulent meningitis have been reported¹⁻³⁾. Recently Suwanwela et al. reported on 6 cases of intracranial mycotic aneurysms of extravascular origin including four intracavernous aneurysms caused by cavernous sinus thrombophlebitis. Our case seems to have the origin similar to theirs, but is quite unique in the location of the aneurysms and the multiplicity of the aneurysms. Though there were nine reports of aneurysms which were in the carotid canal, all of them were solitary and eight of them were thought to be congenital, and one seemed to have occurred after mastoidectomy⁵⁻¹³⁾.

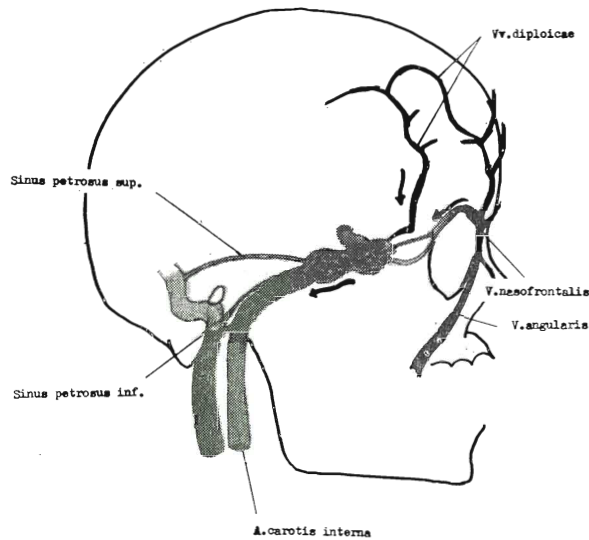


Fig. 6.: Diagram of the causal relationship between osteomyelitis and aneurysmal formation.

As for our case, considering that the aneurysms occurred bilaterally and almost symmetrically, we advocated as follows: Osteomyelitis of the skull was followed by thrombophlebitis of the diploic veins, and the inflammation involved the cavernous sinuses and venous plexuses of the carotid canals, which communicated with the former, by way of the venous system (Fig. 6). It can be said that at the same time the swelling of the eyelids and exophthalmos occurred bilaterally. Perivascular phlebitis invaded the wall of the internal carotid arteries from the outside and aneurysms were performed. They became larger with the gradual destruction of the bone tissue around them by arterial pulsation.

Recently chemotherapy has progressed markedly. It is most likely conceivable that with the insidious course and prolongation of meningitis and cavernous sinus thrombophlebitis, multiple mycotic aneurysms will develop not infrequently.

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