AN INTERNAL CAROTID ANEURYSM IN THE PETROUS TEMPORAL BONE

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Intracranial aneurysms have received much attention and provoked the interest of many investigators since Biumi of Milan described a case in 1765, a full account of which was later published by Sandifort in 1778.

Out of 559 cases of intracranial aneurysms reported in the literature by von Hofmann (1894), Wichern (1912), Fearnside (1916), Busse (1920-21), Drennan (1921), Szekely (1928), and Hamby (1952), none was reported to involve the internal carotid artery along its course in the petrous temporal bone.

Pierini and Agra (1954) have described a case of petrous aneurysm without any pathological documentation.

Case Report

The patient, G.D., was a male Egyptian aged 19 years.

History.—Four years before death, the disease started with attacks of left temporal headache, not associated with vomiting. It was partially relieved by analgesics. There was occasional diplopia on looking to the left side. This continued for three years and was followed by the sudden onset of paralysis of the left side of the face. A few months later the patient experienced tinnitus and roaring in the left ear which was followed, in a few weeks, by deafness. Later on, the patient noticed difficulty in swallowing solid food.

There was no ear discharge and no voice changes, or sensory, motor, or visual disturbances.

The patient was a tall, well-built young man with no intellectual or speech disturbances.

Central Nervous System.—Visual acuity was normal and fields of vision were full without fundus changes. The patient had left sixth nerve paresis, lower motor neurone paralysis of the left facial nerve; deafness of the left ear confirmed by audiogram recording; deviation of the soft palate to the right side; weakness of the pharyngeal muscles of the left side, and deviation of the tongue to the left. Coordination was normal. No motor, sensory, or reflex changes were detected.

Examination of the nasopharynx revealed no abnormality. Serological tests were normal.

X-ray Examination.—The left petrous temporal bone showed erosion of the apex of the left pyramid involving the vestibule of the labyrinth.

Operation.—A posterior fossa exploration revealed a soft tissue mass displacing the dura posteriorly over the medial portion of the left petrous temporal bone. The lower cranial nerves were seen piercing the dura and apparently entering the swelling. They looked healthy in their intracranial course. As the dura was being dissected from the swelling a profuse uncontrollable haemorrhage occurred. This necessitated ligation of the left internal carotid artery in the neck, but the patient succumbed shortly afterwards.

Necropsy.—The skull was examined and the left internal carotid artery was followed along its course. Its lumen was probed just before it passed through the carotid foramen (Fig. 1). In its course within the petrous temporal bone it was found to show a marked saccular dilatation which eroded the medial part of the left petrous bone pushing the dura posteriorly where it was pierced by the left lower cranial nerves. The bone, especially at the petrous apex, was found to be rough and eroded, evidently by the pressure of the aneurysmal dilatation. The foramina of exit of the left lower cranial nerves showed irregular spicules of osteophytes.

Swelling and oedema of the left hemisphere were the only naked-eye abnormalities.

Other organs showed generalized acute congestion as a result of medullary failure. No congenital anomaly was noted.

Histology.—The wall of the aneurysm showed thickening of the intima which was formed of fibrous tissue.

FIG. 1.—Photograph of the petrous temporal bone and the internal carotid artery with the aneurysm. A probe is passed through the artery from its entry to its exit, demonstrating the saccular cavity of the aneurysm and the erosion of the bone.

The endothelium was eroded and recent thrombi were adherent to it. The media was replaced by fibrous tissue and only strips of degenerated elastic fibres were noted (Hart's elastic stain and Van Gieson). Sections of bone showed non-specific erosion of the bone constituents, evidently due to pressure atrophy.

Discussion

The clinical diagnosis in this case was difficult. It presented as unilateral multiple cranial nerve lesions in the posterior fossa without any evidence of brain compression and revealed erosion of the petrous temporal bone, features commonly explained by, say, a glomus body tumour. Although most glomus body tumours present with aural symptoms alone, some show both aural and neurological symptoms, and four such cases have been reported (Bickerstaff and Howell, 1953; Revilla, 1948; and Capps, 1952), in which the neurological symptoms were the only manifestation.

All reported cases of glomus body tumour, however, had a much longer history, five to 20 years, compared with the short history in the case reported here.

The clinical picture presented by our case is usually caused by some variety of tumour or occasionally by an aneurysm of the vertebral artery. Our case indicates that a further possibility must be added to the more common causes.

In our case the aneurysm did not occur at an arterial bifurcation. It arose to one side of the stem of the artery. It attained a huge size to reach a diameter of about 4 cm. In structure it is similar to those rare aneurysms seen on the stem of the internal carotid in its intracranial course, the stem of the

basilar and that of the vertebral arteries. They usually attain a large size and produce symptoms of compression. The theory accepted for the development of such aneurysms is that they are the result of incomplete involution of an artery or arteries from the original embryonic capillary plexus which develops later in the adult circle of Willis (Sugar, 1951; Padget, 1944; Hamby, 1952).

The nature and histological picture of the reported case suggests that it belongs to this category of aneurysms. It is therefore a true congenital aneurysm which had been present since birth. It had gradually enlarged in size till it eroded the petrous temporal bone and compressed the regional cranial nerves.

Summary and Conclusions

A unique case of aneurysm of the internal carotid artery in the petrous temporal bone is reported; it caused compression of several cranial nerves.

On histopathological grounds this was thought to belong to the category of true congenital aneurysms.

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