Aneurysmal bone cyst of the skull

Case Report

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✔ A case of giant aneurysmal bone cyst of the skull is reported. Treatment was by
total excision in three-staged surgery. The patient made a good recovery.

KEY WORDS • benign neoplasm • aneurysmal bone cyst • skull

Jaffe and Lichtenstein4 coined the
term "aneurysmal bone cyst." They
proposed that it originates as a vascular
disturbance giving the characteristic radiological picture of a "blow-out" of bone. These
bone cysts generally occur throughout
the skeleton but rarely in the skull. Recently we
treated a patient with a giant aneurysmal
bone cyst in the right half of the cranium.

Case Report

This 14-year-old boy was admitted to the
neurosurgical unit on August 29, 1975. He
had a swelling on the right side of the head
that had been gradually increasing for the last
6 years. There was no history of trauma. The
swelling first started in the right temporal
bone, just medial to and above the mastoid
process, and had grown forward toward the
temporal squama, and backward and
medially toward the external occipital pro-
tuberance. The patient had experienced
headache and neck pain for 1 month before ad-
mission.

Examination. The patient had a large
swelling in the right temporal and occipital
areas (Fig. 1). It was 14 cm long anteropo-
teriorly, 10 cm in diameter at the occipital
region, 2 cm at the anterior temporal region,
and 10 cm in height at the occipital region.
The pinna on the right side was displaced by
the mass and the external auditory canal was
compressed to a slit anteroposteriorly. The
mass was hard and lobulated. Neurological
examination was negative except for slight
right facial weakness and minimally de-
creased hearing.

Plain x-ray skull films in the Towne's view,
lateral view with neck flexed, and anteropo-
terior view showed a large, 10 to 12 cm, mul-
tilocular swelling with peripheral sclerosis
giving a "blow-out" appearance, typical of an
aneurysmal bone cyst. Carotid angiography
revealed marked displacement of the middle
cerebral artery (Fig. 2), and extensive ex-
ternal carotid supply to the tumor.

Operations. On September 20, 1975, biop-
sy of the anteriormost cyst in the temporal
region was done. When the cyst was opened, a
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FIG. 1. Lateral (left) and posterior (right) views of the patient showing the swelling.

A gush of about 6 oz of venous blood came out, after which the venous blood in the cyst was seen to be pulsating. The contents of the cyst were aspirated, and the wall of the cavity was sent for pathological examination. The diagnosis was aneurysmal bone cyst. Subsequently the tumor remained the same size.

On January 8, 1976, 3½ months after the biopsy, elective surgery was carried out. After reflection of a scalp flap the outer shell of bone was removed. A sheet of yellowish white, rubbery lining, 1 cm thick, was found in the cyst. The contents of the cyst could be scooped out easily. It consisted of varicolored material resembling old clot with minimal fibrosis. The capsule of the cyst was fibrous and peeled off easily in one layer. The shell wall at the medial aspect was nearly 1½ cm to 2 cm thick and was soft and granular, which could be rongeured off easily. It was completely removed when it was found to extend up to the parasagittal plane. The surface of the inner wall of the cyst was irregular, and multiple bony tubercles projected into the cavity. This was easily separated from the dura, except near the lateral sinus where it was firmly adherent and where some troublesome bleeding was encountered. It was found that the tumor was fed by the stem of the middle meningeal artery. A few islands of bone formed by the inner shell wall were left behind. The patient had an uneventful recovery.

On March 30, 1976, 2½ months later, the anterior end of the outer shell near the zygoma and above the right ear, which had been left behind at the previous operations, was removed completely. An excellent cosmetic result was obtained (Fig. 3).

Pathological Examination. The cyst wall consisted of large blood spaces with no endothelial lining or muscle. Giant cells and rare osteoid focus could be seen (Fig. 4). It was a typical aneurysmal bone cyst. There was no evidence of fibrous dysplasia in some of the material.

FIG. 2. Angiograph showing the huge cyst and displacement of the branches of the middle cerebral artery.
Aneurysmal bone cyst

Discussion

Jaffe and Lichtenstein suggested the name "aneurysmal bone cyst" to indicate that this lesion arose in a bone giving a typical "blow-out" appearance in the x-ray film, and usually in the immature skeleton as in a child or an adolescent. The nature and origin of aneurysmal bone cysts remain unknown, although all accounts indicate it to be a benign condition. Swelling and pain are the two main symptoms. A bone cyst forms as a result of local change in the hemodynamics, such as a sudden venous occlusion, or the development of an arteriovenous shunt, possibly occurring in a pre-existing lesion. The cyst contents as seen at surgery are usually blood, less commonly a fleshy vascular material, a fibro-gelatinous material, serosanguinous fluid, a soft gray material, a firm rather avascular tissue, spongy vascular tissue, or dark red tissue that is friable and vascular.

Jaffe favored the opinion that aneurysmal bone cyst occurs in a pre-existing lesion like fibrous dysplasia, chondromyxoid fibroma, or a unicameral bone cyst. Trauma has been put forward as an important etiological factor by Thompson and Barnes. Even if trauma is a cause, there must be other factors, because of the rarity of occurrence of aneurysmal bone cysts with a vast number of bone injuries. Edling regarded aneurysmal bone cyst as one of the manifestations of solitary dysfibroplasia of bone, suggesting a defect in the development of the epiphyseal plate. This does not explain its occasional occurrence in mature bones.

From these suggested etiologies it is clear that this lesion may occur near the growth cartilage of the juvenile bone (the most vascular region). This was true in our experience. In the Indian literature only one previous case of aneurysmal bone cyst arising from the temporal bone is reported (Saxena and Sharma), and ours is the second case. Clough and Price thought it possible that the concept of evolutionary change may offer a link between the vascular hypothesis and the concept of close relationship between aneurysmal bone cyst, unicameral bone cyst, and fibrous dysplasia.

We have not found a previous report of such a giant-sized aneurysmal bone cyst involving the temporal and occipital bones as in our case. This tumor was successfully managed in three stages of operation and the patient had an uneventful recovery. Spontaneous regression and regression after a minor surgical procedure have been noted in
the literature. Usually a careful curettage and bone grafting is enough. Occasional recurrence after an incomplete removal makes one feel that a thorough local excision should be done whenever possible.

References

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