Osteoma of the ethmofrontal sinus

Case report

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An unusually large osteoma of the ethmofrontal sinus is described, and the related
literature is briefly reviewed. The authors believe frontal exploration is necessary in
cases of extensive osteomas of the frontal sinus.

KEY WORDS • osteoma • frontal sinus

OSTEO MAS of the paranasal sinuses are
comparatively uncommon. Most cases
are seen by otorhinolaryngologists;
only a few come to the attention of
neurosurgeons because of possible or es-
tablished intracranial complications. Mehta
and Grewal10 reported 50 osteomas in 5086
patients complaining of sinusitis. Most of the
paranasal osteomas seen in Ibadan are too
small to warrant surgical intervention.

We are reporting this case not only because
of the enormous size of the osteoma, but also
to stress the need for surgical exploration.

Case Report

A 16-year-old boy was admitted to the
University College Hospital, Ibadan,
Nigeria, in August, 1973, with left supraor-
bital swelling. Eighteen months prior to ad-
mission, a stone thrown by a schoolmate hit
him in the left supraorbital region. There was
slight bruising over the site of impact and
iodine solution was applied locally. He also
had epistaxis for about 5 days, followed by a
left nasal discharge. Soon after the injury, a
painful swelling appeared in the left supraor-
bital region. The swelling had steadily in-
creased in size, while the other symptoms had
disappeared.

Examination. The patient had a stony hard
swelling 6 cm in diameter over the left
supraorbital region. The swelling was fixed to
the underlying bone but was not attached to
the overlying skin; it was slightly tender to
touch, but not warm or indurated. He had no
other swellings on the scalp, face, or neck. No
neurological deficit was found, and the other
systems were normal. Plain skull x-rays
showed a dense opacity which appeared to fill
the frontal sinuses and extend into the left
ethmoidal sinus (Fig. 1). A left carotid
angiogram was normal. The patient had a
packed cell volume (PCV) of 42%, white cell
count of 3500/mm³, and genotype AA.
Serum electrolytes and urea were within nor-
mal limits.
Operation. A bifrontal craniectomy was carried out through a bicoronal flap. This was necessary because the osteoma had eroded through the frontal bone. A stony hard mass occupied both frontal sinuses, particularly on the left, where the mass extended down into the ethmoid sinus and the upper part of the nasal cavity. The superomedial wall of the left orbit was markedly thinned, with multiple minute mucoceles. The dura mater was intact but considerably compressed by the tumor. The edge of the osteoma was clearly defined, and was attached inferiorly by a pedicle. The tumor was delivered intact by gentle rocking which severed the pedicle. This created a huge frontonasal defect, but bleeding was minimal. A frontonasal drainage tube was inserted and removed after 48 hours. The pericranium was approximated and the skin closed in one layer with silk. We made no attempt at cranioplasty.

The postoperative course was uneventful. The scalp wound healed well, but the patient was left with a frontal defect. He is to have an acrylic cranioplasty 3 months after operation.

Pathological Examination. The osteoma weighed 150 gm, and was 10 cm long, 8 cm wide, and 5 cm thick. It was a yellowish-white multilobulated rock-hard mass, found on section to be completely calcified; this gave it a marble-like appearance. Microscopy showed the wide irregular trabeculae of mature bone that formed the whole of the mass (Fig. 2), and showed little evidence of new bone formation. The ultratrabecular tissue was sparse and vascular.

Discussion

Most of the reports on osteomas of the paranasal sinuses have been made on small series or single cases. A few theories have been offered on the genesis of osteomas. Arnold suggested that errors of growth are more likely to occur at the junction of two bones, one of which is formed in membrane (frontal) and the other in cartilage (ethmoid). Ossification of the fetal cartilage at the junction of the ethmoid and frontal sinuses therefore results in osteomas.

Dolbeau declared that osteomata arose from mucoperiosteum lining the wall of the parent sinus. Fetsis believed tumor initiated from a section of the periosteum that split from a bone at an early age and developed into a tumor under the influence of irritation.

The role of trauma in the genesis of osteomas was first suggested by Cushing and highlighted in the case reports of Appalanarasayya, et al., and Cassady and Alexander. Thus the history of trauma in our patient may be etiologically significant. The male preponderance reported in most series has been attributed by some to the greater liability to trauma in males and also to the larger size of their sinuses. Dowling has suggested infection as an important etiological factor in osteoma formation.

According to Mehta and Grewal, the frontal sinus is the predominant site (96%) for the occurrence of osteoma, with negligible involvement of the ethmoidal (2%), maxillary
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(2%), and the sphenoid sinuses. Of the five cases of osteoma of the paranasal sinuses described by Rowbotham, four were in the frontal sinus. The age incidence is variable; 80% of Mehta and Grewal’s cases occurred in patients from 10 to 30 years old, and the ages of Rowbotham’s cases ranged from 18 to 58.

Osteomas are benign, slow-growing tumors, of three main types. The usual variety is ivory hard, as in our case; less common is the compact or solid type which has normal bone architecture, while the least common is the spongy and most immature type. Histologically, the tumors may be composed of pure fibrous tissue or pure bone. Most are a mixture of the two tissues.

The majority of osteomas are asymptomatic. Depending on the direction of the growth, their common clinical features include pain, deformity, visual disturbance, and infection.

Bartlett’s excellent paper described the various intracranial neurological complications in five patients with osteomas involving the ethmoidal sinus. Fistulous connections between the nasal passages and the intracranial cavity led to the formation of an aerocele in two patients and meningitis in one. Hemiplegia, epilepsy, irritability, and drowsiness were the common neurological complications. Our patient had no neurological signs or complications; however, we believe that in time he would have developed neurological problems, as the dura mater was already considerably compressed by the osteoma.

Radiological examination remains the main diagnostic tool. Appalanarasayya, et al., recommended orbitography with contrast medium or air in patients with proptosis. Andrew has suggested that small osteomas found in routine radiological examinations should be kept under observation, while those causing symptoms or obvious obstruction of the frontal nasal duct should be excised through an external approach. He also recommended prompt excision through a frontal craniotomy of an osteoma obliterating its parent sinus or extending beyond the sinus.

On the whole, the results of surgery in reported cases of frontonasal osteoma have been good. Our case report further emphasizes the benefit of craniotomy in treating this disease.

References
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