

Fronto-ethmoid osteoma: the place of surgery

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Abstract

Osteomas of the paranasal sinuses are common. Most are, however, asymptomatic and a chance radiographic finding. We describe four case histories which help to illustrate the benefits and hazards of surgery, and highlight the importance of patient selection. A review of the literature is presented.

Key words: Osteoma; Paranasal sinuses

Introduction

Osteomas are common and slow-growing lesions that often appear as an incidental finding on X-ray, and this frequently raises the question as to whether surgical excision is indicated. Earwaker in 1993 reported a survey of 1500 coronal sinonasal computed tomography (CT) scans, in which 46 patients (three per cent) were found to have paranasal sinus osteomas. Most of these patients were in the fifth and sixth decades, and the male to female ratio was 1.3:1. The frontal sinus was the most frequent site of origin followed by the ethmoid and maxillary sinuses. The diameter of the lesions varied from 1.5 to 30 mm, but 37 per cent were 5 mm or less. Of the total, only two patients were symptomatic and only three had their osteomas excised.

The indications for the surgical treatment of osteomas of the frontal and ethmoid sinuses were reviewed by Savic and Djeric in 1990. They suggest surgical removal for osteomas extending beyond the boundaries of the frontal sinus, those which continue to enlarge, those which are localized in the region adjacent to the frontonasal recess, those associated with chronic sinusitis and osteomas of the ethmoid sinuses irrespective of their size. They also propose removal in patients with osteomas who complain of headache when other causes of headache have been excluded. Teed (1941) argued a case for removing osteomas before they became symptomatic. There is no uniform agreement about the method of treatment.

Savic and Djeric (1990) describe the osteoplastic flap as the operation of choice. Ciappetta and colleagues in 1992 in a series of 19 surgically treated osteomas, make a distinction between the treatment of frontal and fronto-ethmoidal osteomas suggesting frontal craniotomy for the former and osteotomies for the latter. Soboroff and Nykiel (1966) described three approaches for large fronto-ethmoid osteomas: an osteoplastic flap, lateral rhinotomy and a direct anterior approach to the frontal sinus.

Oostvogel and Huttenbrink in 1991 reported that osteomas arising from suture lines have a significantly reduced fibrovascular component. The aetiology of osteomas is debated but the most commonly accepted theories are embryologic, traumatic or infectious. Schwartz and Crockett reviewed the evidence in 1990, and favoured the

combination of developmental and traumatic theories put forward by Samy and Mostafa in 1971. Histologically, the lesion may be of cancellous (osteoma spongiosum) or compact type bone, the former being the commoner (Fu and Perzin, 1974).

To illustrate the potential benefits and hazards of surgery for fronto-ethmoid osteoma and the importance of patient selection, we will describe four case histories and discuss them.

Case reports

Case 1

A 59-year-old male was referred to the ophthalmologists by his general practitioner in 1993 with right proptosis and ectropion, but normal vision. The patient had noticed a swelling which had increased in size over a period of 13 years. There was a marked right proptosis. The patient had an axial and coronal CT scan which showed an extremely dense bony mass situated in the anterior ethmoid air cells and extending laterally into the right orbit. The mass was displacing the right globe and muscle cone laterally. The right optic nerve, although displaced was not compressed in the region of the orbital apex. The appearances were of an osteoma of the right anterior ethmoid air cells extending into the right orbit (Figure 1).

The patient was symptomless apart from concern about his appearance. Clinical examination revealed a 3 cm diameter bony hard mass at the medial canthus, proptosis and lateral displacement of the right globe (Figure 2).

The osteoma was approached via a Lynch/Howarth incision. The medial canthal ligament was cut to afford greater access to the osteoma. The osteoma was 'shelled out' using a drill and then infractioned to minimize trauma to surrounding structures. A slither of osteoma was retained both superiorly and medially, to preserve the orbital architecture. The medial canthal ligament was reattached with a mini-plate and 7 mm screws. The density of the lesion would suggest that it was of suture line origin. Horizontal wedge excision was also performed to shorten the right lower lid and reduce ectropion. Post-operatively (Figure 3), the patient reported being able to see to perform fine motor function tasks one month post-

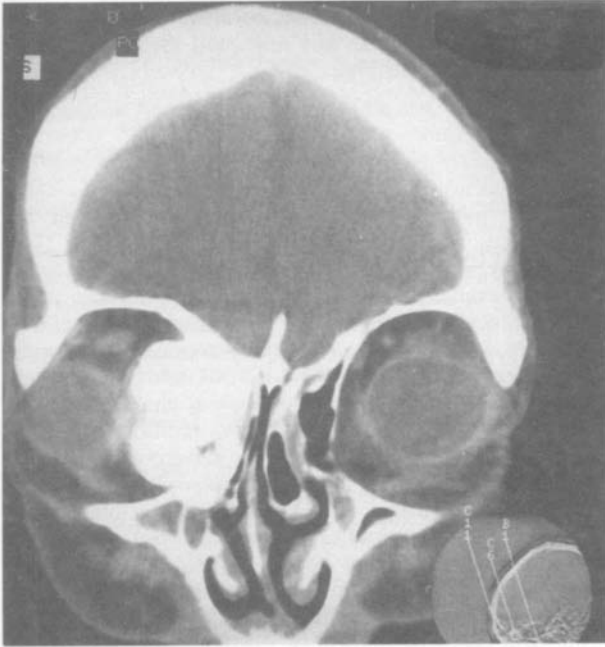


FIG. 1

CT scans showing displacement of orbit contents by osteoma.

operatively, which he had previously been unable to do. This was not due to an improvement in visual acuity but that convergence for close objects improved.

Case 2

A 47-year-old man had an eight-year history of right frontal headache. He had no nasal symptoms other than moderate nasal congestion at night. He was investigated at another unit and underwent a CT scan which showed a frontal sinus osteoma (Figure 4). The osteoma was excised using a coronal incision and an osteoplastic flap. The osteoma was almost totally removed, the sinus mucosa was largely preserved and the sinuses were not obliterated. The patient made an uneventful recovery but was symptomatically no better. He was referred to this unit to consider whether obliteration of the frontal sinuses should be performed. A review of the history revealed that his frontal headaches were sporadic, not associated with upper respiratory tract infections, were associated with nausea and made him feel that he wanted to lie down in a darkened room for several hours. Endoscopic examination of the nose was normal. A trial of sumatriptan taken at the



FIG. 2

Cosmetic disfigurement produced by a large osteoma.



FIG. 3

Post-operative appearance.

onset of his symptoms eradicated them. A diagnosis of common migraine was made.

Case 3

A 73-year-old man presented with persistent frontal headaches. He had no nasal symptoms. The surgeon who initially saw him ordered a plain X-ray which showed a large osteoma (Figure 5). A CT scan was also done. He underwent excision of the osteoma via a coronal flap. This operation was complicated by the development of cerebrospinal fluid rhinorrhoea. His symptom of frontal headache remained after surgery. He was referred to this unit. A review of his symptoms revealed that his persistent frontal headaches were of a 'band-like' nature and not relieved or exacerbated by analgesics or respiratory tract infections. A provisional diagnosis of tension headache was made. A trial of low-dose amitriptyline, 10 mg at night, was given for six weeks. His symptoms completely



FIG. 4

Axial CT scan of frontal sinus osteoma in a patient with migraine.



FIG. 5

Axial CT scan of frontal sinus osteoma in a patient with tension headache.

resolved. Following this, his CSF leak was confirmed by immunofixation of β -transferrin. A coronal flap approach with a fascia lata graft was performed to close his dural defect. He was continued on low-dose amitriptyline for four months and he has been asymptomatic.

Case 4

A 50-year-old man complained of nasal congestion. His general practitioner, unaware of the guidelines produced by the Royal College of Radiologists (1993) advising against the use of plain sinus radiographs in general practice, ordered one. This showed a large frontal sinus osteoma (Figure 6). He was referred to this unit and at that



FIG. 6

Plain sinus radiograph showing a large frontal sinus osteoma.

time he had been asymptomatic for several weeks. No action was taken and he has remained asymptomatic for six months after discharge.

Discussion

Osteomas are the commonest benign neoplasms of the nose and paranasal sinuses. Greenspan reviewed the clinical presentation and differential diagnosis in 1993, stating that periosteal osteosarcoma is the most important lesion to exclude and that this may be difficult to do radiographically. Osteomas are associated with Gardner's syndrome, which is an autosomally-dominantly inherited disorder common in the Mormons of Utah (Gardner and Plenk, 1953; Dolan *et al.*, 1973). It is characterized by intestinal polyposis, bone lesions and multiple cutaneous and subcutaneous lesions such as sebaceous cysts and desmoid tumours. Patients with tuberous sclerosis may also have osteomas (Mirra *et al.*, 1988), but the majority of osteomas occur sporadically and are not part of a syndrome.

Small osteomas are almost always asymptomatic and a chance radiographic finding. The larger lesions may produce a cosmetic deformity, obstruction of the frontonasal recess and mucocoele formation. In themselves they do not appear to cause pain. When there are symptoms of headache or pain, it is important to ensure there is no other cause as Cases 2 and 3 illustrate. Without evidence of complete obstruction of the frontonasal recess evidence of coexisting sinus disease, we would advise extreme caution in attributing symptoms to them. Anosmia has also been reported (Pool *et al.*, 1962). Exophthalmos, diplopia and optic nerve compression can occur with osteomas near the orbit (Sadry *et al.*, 1988). Our first case highlights the fact that patients may present with an advanced lesion but with few symptoms other than disfigurement.

Conclusion

Osteomas of the nose and paranasal sinuses are often found incidentally and do not require surgical intervention. We describe a series of cases of large fronto-ethmoid osteomas illustrating a need for caution before advocating their removal. We propose that the following indications may justify excision of a fronto-ethmoid osteoma:

- (1) Cosmetic deformity
- (2) Frontonasal recess obstruction with evidence of sinus disease either by history related to upper respiratory tract infections, or mucosal disease apparent on computerized tomography, although this finding has been shown not to be specific (Bolger *et al.*, 1991; Lloyd *et al.*, 1991).
- (3) Displacement of the orbital contents.
- (4) Mucocoele formation.

There is doubt as to whether osteomas cause symptoms of headache or facial pain where there is no evidence of sinus disease. Certainly, in themselves, benign bony expansions elsewhere do not cause pain. In the case of fronto-ethmoid osteomas this is exemplified by the fact that the majority of them are found incidentally in patients who are having radiographs for other reasons.

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