

Osteoma of the internal auditory canal: case report

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Abstract

A 42-year-old man with normal hearing presented with a long history of vertigo and tinnitus. CT scan showed large osteomata of the internal auditory canal. Magnetic resonance imaging (MRI) was normal. The osteomata were removed surgically via the retrosigmoid approach and examined histologically. His symptoms were abolished. As MRI has become the gold standard in the search for small acoustic tumours it is likely that symptomatic bony lesions, rare though they are, will be missed if MRI is the sole imaging modality. A review of the literature is included.

Key words: Auditory canal, internal; Osteoma

Introduction

Reports of osteoma of the internal auditory canal (IAC) rarely combine histopathological data with the results of surgery. A case is reported, with histopathology, of a patient whose symptoms were cured by surgery.

Case report

A 42-year-old man was referred to the senior surgical

author (P.A.F.) with a 20-year history of episodic imbalance, lasting one or two hours at a time. In the six months before referral he had developed episodic rotatory vertigo associated with nausea and vomiting to the point where his

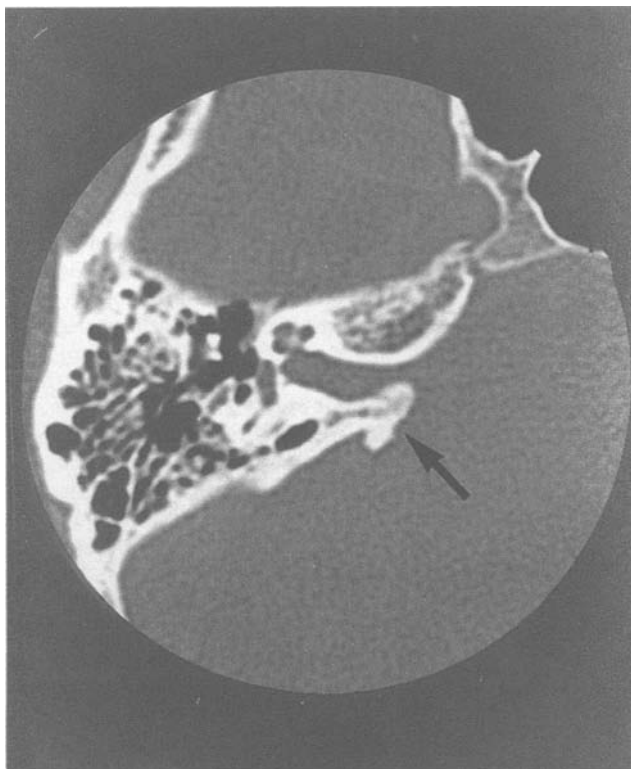


FIG. 1

Pre-operation bone window CT scan of internal auditory canal osteoma. Arrow. Right side.

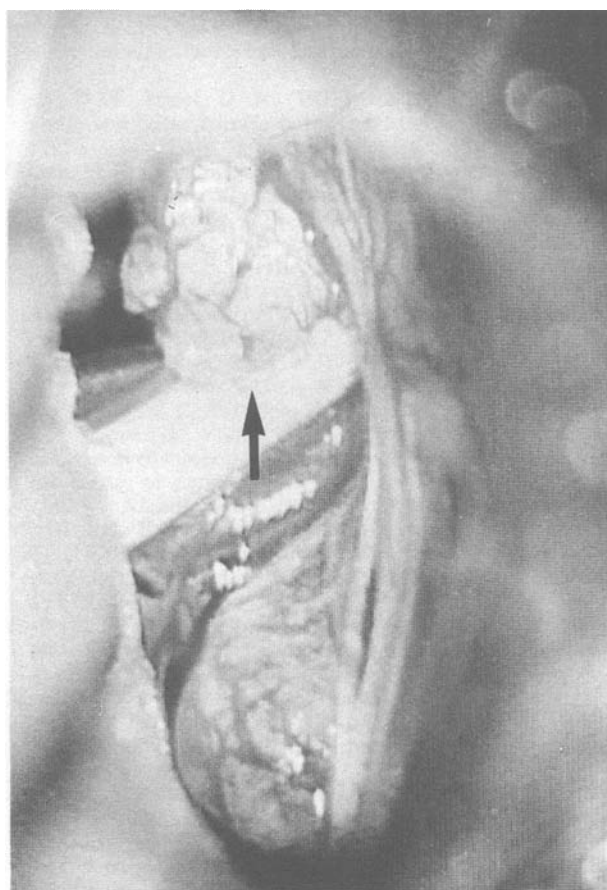


FIG. 2

Intra-operative photograph of facial-cochlear-vestibular nerve complex, bowed inferiorly by upper osteoma (Arrow).

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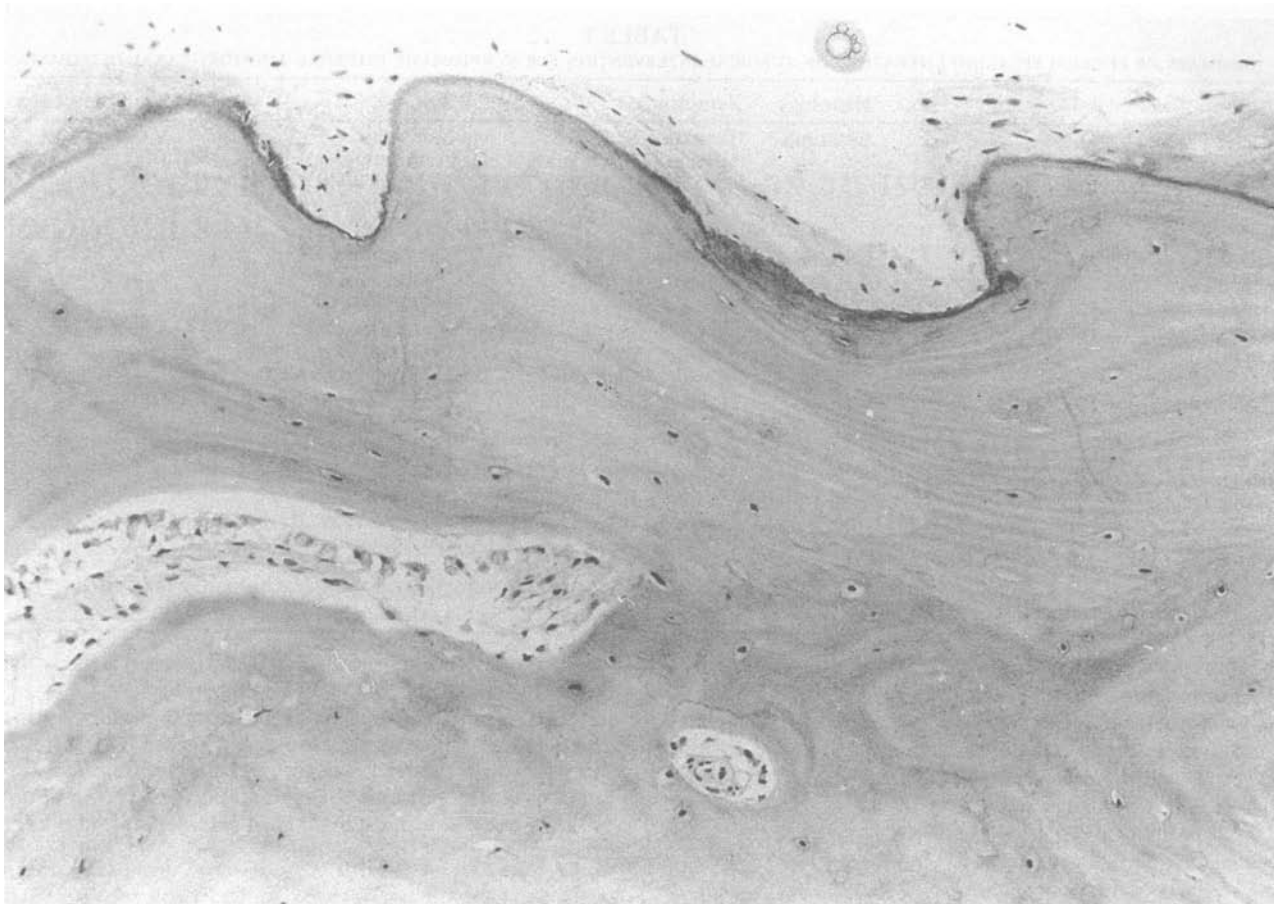


FIG. 3

Photomicrograph of peripheral part of compact osteoma. The superficial surface is above. The bone is lamellar and of cortical-type, with large fibrovascular channels. (H & E; $\times 10$).

life was seriously disrupted. There was no hearing loss but unilateral tinnitus was a constant feature. Physical examination was normal, as was a pure tone audiogram. CT scan (Figure 1) showed large osteomata arising above and below the porus of the right internal auditory canal. MRI scan, performed elsewhere before referral, was entirely normal. Electronystagmography (ENG) showed an absent caloric response on the right side.

In November 1991, a retro-sigmoid approach was used to give access to the cerebello-pontine angle. The osteomata were removed using high-speed diamond burrs. The facial-cochlear-vestibular nerve complex was noted to be bowed inferiorly by the upper osteoma (Figure 2). Histopathological examination was consistent with compact osteoma (Figure 3). The specimens were round in shape and microscopically were composed of cortical-type lamellar bone, with large fibrovascular channels extending almost to the surface of the bone. Vertigo, imbalance and tinnitus were noted to be cured and have not recurred two years after surgery. CT scan taken six months after surgery showed no evidence of recurrence (Figure 4). The audiogram remained normal but caloric response on the right side did not recover.

Discussion

Osteoma, though common in the external auditory canal rarely occurs in the internal auditory canal. It may be that many osteomata in the latter area are asymptomatic and remain undiagnosed. Theoretically these lesions can cause symptoms related to the seventh or eighth cranial nerves, however no case with seventh nerve symptoms has yet

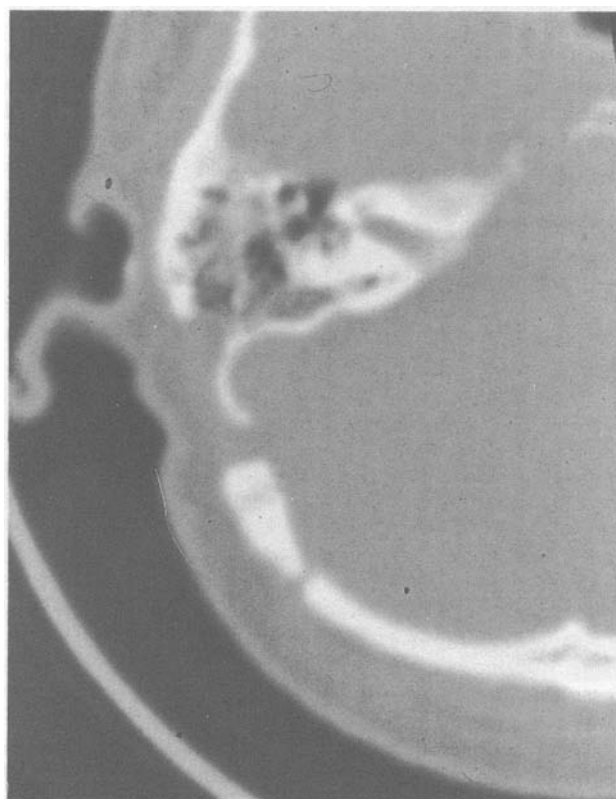


FIG. 4

Post-operative CT scan. There is no evidence of new bone growth.

TABLE I
SUMMARY OF ENGLISH SPEAKING LITERATURE ON SURGICAL INTERVENTION FOR SYMPTOMATIC INTERNAL AUDITORY CANAL OSTEOMATA

Author	Age	Sex	Histology	Symptoms	Surgery	Symptoms cured
Clerico <i>et al.</i> (1994)	59	F	Osteoma	Tinnitus (T) – 2/12 Vertigo (V) – 3 years Hearing loss (HL) – 2/12	Sub:occip: craniotomy. Lesion drilled. Sub:vestib: nerve section.	V only
Estrem <i>et al.</i> (1993)	56	F	Osteoma	Tinnitus – 18/12 Vertigo – 6 years	Sub:occip: craniotomy. Lesion drilled.	T + V
Ramsay and Brackmann (1994)	30	F	–	Tinnitus – 4 years Vertigo – weeks Hearing Loss – 4/12	Mid:fossa craniotomy. Lesion drilled. IAC decompression.	T + V + HL
Doan and Powell (1988)	53	M	–	Hearing Loss – 4/12	Mid:fossa craniotomy. Lesion drilled. IAC decompression.	HL
Roberto <i>et al.</i> (1979)	33	F	–	Tinnitus – 3/12 Vertigo – 18/12 Hearing Loss – 15 years	Mid:fossa craniotomy. Sup/inf vestib. nerve section. IAC decompression. Lesion drilled.	T + V
This Report	42	M	Osteoma	Vertigo – 20 years Tinnitus – 20 years	Retrosigmoid approach. Lesion drilled.	T + V

been reported. (The English literature was reviewed to find other similar cases).

Osteomata and exostoses in the temporal bone have traditionally been classified according to the clinical macroscopic criteria first described by Sheehy (1958). The histopathological characteristics were first described by Graham (1979) and have been quoted many times since. A major differentiating factor between osteomata and exostoses, according to Graham is the absence of perivascular channels in the latter. Subperiosteal parallel concentric dense layers of bone are said to be characteristic of exostoses. Recent work by Fanton *et al.* (1995) suggests that these differentiating criteria are unreliable when applied to small surgical biopsies of the external auditory canal, although clinically and in temporal bone sections (Schuknecht, 1993), exostosis and osteoma can readily be distinguished. This difficulty does not arise in bony tumours of the internal auditory canal, where clinical exostoses do not occur. One case report of exostoses of the internal canal (Doan and Powell, 1988) did not include histopathology. In the present case, the appearance at surgery was typical of osteoma and the history was that of compact osteoma using the traditional histopathological criteria (Graham, 1979).

IAC osteomata with histological confirmation, have been reported in the literature, but only two of these include the results of surgical intervention (Clerico *et al.*, 1994). The relevant cases are included in Table I.

Lesions of the porus of this type are more common in females, particularly when post-menopausal (Clerico *et al.*, 1994). In those cases that came to surgery, tinnitus and vertigo are generally cured, by removal of the lesion, by decompression of the internal auditory canal, vestibular nerve section or a combination of these (Roberto *et al.*, 1979, Doan and Powell, 1988, Estrem *et al.*, 1993, Clerico *et al.*, 1994, Ramsay and Brackmann, 1994). Two cases with hearing loss improved after surgery (Doan and Powell, 1988; Clerico *et al.*, 1994). Singh *et al.* (1992) reported a case that presented with sudden hearing loss but surgery was not undertaken.

MRI has become the standard investigation to exclude acoustic tumours and related lesions. The principal indication is the search for a small tumour in a patient with unilateral hearing loss and/or tinnitus. Given the negative MRI findings in this case and the inability of MRI

to distinguish bone from CSF in many cases, it is likely that bony lesions of this type will be missed.

This is the third report of internal auditory canal osteoma in which histopathological material is included together with the results of surgical intervention. This case and a literature review suggests that when these rare lesions become symptomatic, surgical intervention is likely to produce relief of symptoms.

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