The Journal of Laryngology and Otology
July 1994, Vol. **108,** pp. 607–609

Radiology in Focus

Glomus tympanicum chemodectoma: unusual radiological findings

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Abstract
A 64-year-old Qatari female, with a one-year history of right otorrhoea and deafness, had a reddish-white mass projecting into the right ear canal, through the tympanic membrane, that proved histopathologically to be a paraganglioma. Computerized tomography (CT) of the temporal bones showed extensive destruction of the right mastoid bone, the posterior ear canal wall, and the sinus plate, with total disruption of the ossicles, simulating a malignant tumour, which is unusual for a middle ear paraganglioma.

Key words: Paraganglioma, non-chromaffin; Radiology; Middle ear

Case report

A 64-year-old Qatari female patient, presented to the ENT clinic in Hamad General Hospital in Qatar, with a one-year history of right otorrhoea, sometimes bloodstained, associated with deafness and a two-day history of dizziness. There was no history of tinnitus.

Examination revealed a reddish-white mass filling the right ear canal. The rest of the ENT examination was normal. Cranial nerves, apart from the cochlear, were intact and all other systems, including the central nervous system, were normal. Routine blood counts and chemistry were normal and the chest X-ray was clear. Audiometry showed bilateral bone conduction hearing level to be 50 dB and air conduction in the right ear was 90 dB.

High resolution computerized tomography (2 mm) scans of both temporal bones were carried out, together with post-contrast scans after high resolution bone window settings, which showed: a slightly enlarged jugular foramen, with no evidence of bone destruction (Figure 1); extensive destruction of the right mastoid bone, involving the posterior wall of the external auditory meatus and the sinus plate; the middle ear was filled with a soft tissue mass, extending to the external ear canal; the ossicles were totally disrupted and the bone destruction extended to the mastoid air cells and antrum. There was no involvement of the inner ear and no intracranial extension (Figures 1 and 2).

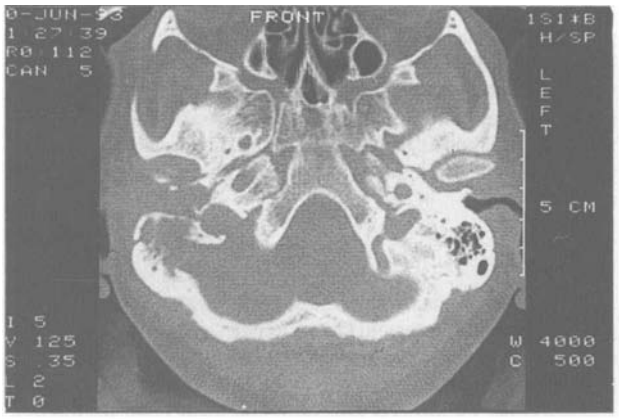

FIG. 1

CT of the temporal bones showing destruction of the right mastoid bone and sinus plate. There is a slight widening of the jugular foramen without bone destruction.

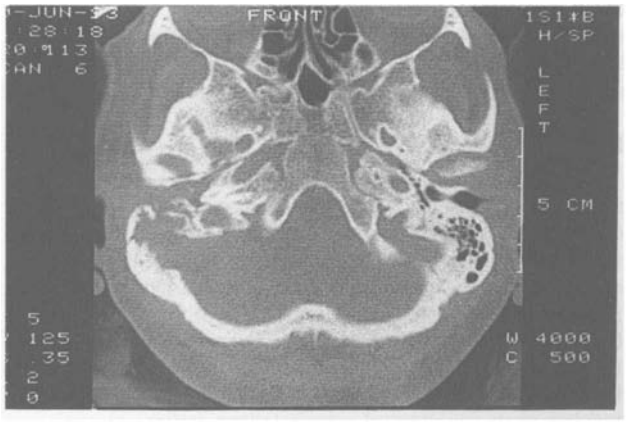

FIG. 2

CT of the temporal bones showing destruction of the right mastoid bone, the posterior ear canal wall and sinus plate. There is a soft tissue mass filling the right middle and external ears.

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Accepted for publication: 7 January 1994.

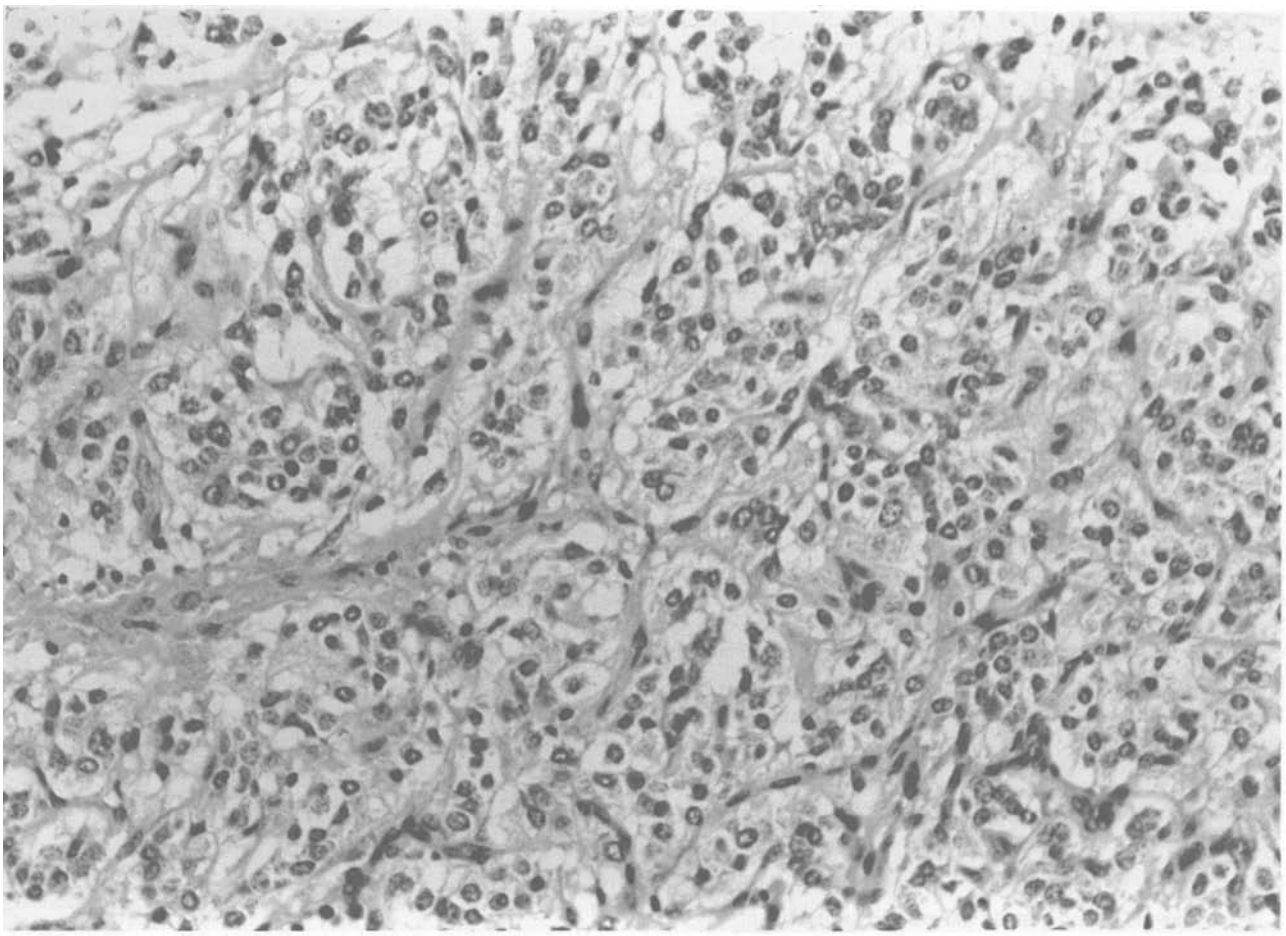

FIG. 3
Middle ear paraganglioma with an alveolar pattern. (H & E; × 120.)

Examination of the right ear under general anaethesia, showed a reddish-white finger-like tumour, which bled on touch, projecting from the middle ear through the tympanic membrane. When snared out, excessive bleeding from the base had to be stopped by pressure packing. Biopsy of the tumour (16 × 6 × 6 mm) showed it to be finger-shaped, firm and give a gritty sensation on cutting. Microscopic examination showed focally ulcerated squamous epithelium, over a fibrous core replaced in the lower half, including the resection edge at the base, by a tumour showing the characteristic features of a paraganglioma (Figure 3).

Discussion

Paragangliomas, though rare, are the commonest middle ear neoplasms. They occur mostly in women, usually above 40 years of age. Middle ear paragangliomas arise from paraganglionic tissue in the jugular bulb, on the cochlear promontory, the tympanic canaliculus or the descending facial canal (Batsakis, 1979). The glomus jugulare arises from the jugular bulb, while the glomus tympanicum arises from the middle ear, usually at the promontory, along Jacobson's nerve. Due to their respective locations, the tympanicum gives otological manifestations early, while the jugulare gives neurological manifestations earlier.

Clinical and radiological evidence in this case was in favour of a glomus tympanicum rather than jugulare because, in spite of the extension of the tumour to the middle and external ears, there was no neurological abnormality and no destruction to the jugular foramen (Figure 1). However, before histopathological proof, a malignant lesion could not be excluded because of the extensive bony destruction of the mastoid bone and antrum, the posterior ear canal wall, the sinus plate and the ossicles (Figures 1 and 2) and also because of the relatively short history of one year; an average of three years before presentation was found in the Larson *et al.* (1987) series.

In the series of 55 cases with glomus tympanicum chemodectomas reviewed by Larson *et al.* (1987), the radiographical findings were of tumours surrounding the ossicles, filling the middle ear or protruding into the ear canal but there was no indication of bony destruction. The same was found in other papers by House and Glasscock (1968) and Chakeres and LaMasters (1984).

Our case shows that radiological evidence of bone destruction in middle ear tumours should not necessarily be considered against the diagnosis of paragangliomas, nor should it constitute proof in favour of a malignant tumour without histopathological confirmation.

Conclusion

A histopathologically confirmed case of right middle ear paraganglioma in a 64-year-old Qatari female, showed by computerized tomography extensive bone destruction, simulating a malignant neoplasm. This was found unusual on review of the literature, so we suggest that radiographical bone destruction can, occasionally, occur with glomus tympanicum tumours.

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https://doi.org/10.1017/S0022215100127586 Published online by Cambridge University Press

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https://doi.org/10.1017/S0022215100127586 Published online by Cambridge University Press