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Clinical Records

Middle ear lipoma

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Abstract
We report a case of primary middle ear lipoma diagnosed in the right ear of a five-year-old child with concurrent bilateral middle ear effusions. The lipoma occupied a site favoured by congenital cholesteatoma and was occlusive to the eustachian tube contributing to its dysfunction. This is the first case of *de novo* middle ear lipoma diagnosed in the UK, and the third in world literature. Our CT scans are suggestive of a similar but smaller lesion in the left ear of the same child.

Key words: Lipoma; Middle ear

Introduction

Lipoma is the commonest benign, adipose tissue neoplasm. It is rare before the age of 20 years, but becomes very common thereafter. Embryologically, adipose tissue originates from the maturation of lipoblasts which are mesenchymal in origin (Veillios *et al.*, 1958) and lipomas are encapsulated masses of this mature adipose tissue. Several histological variants are well described (Hadfield *et al.*, 1985), namely, angiolipomas, myxolipomas, spindle cell lipomas, pleomorphic lipomas and hibernomas (a tumour of brown fat). They may occur as solitary lesions or as part of a systemic lipomatosis, for example, Madelung's disease (Tizian *et al.*, 1963). Lipomas are most commonly encountered superficially as subcutaneous lesions but may also be found in the deeper tissue planes of the limbs, mediastinum, retroperitoneum and in some visceral organs, occasionally causing obstructive symptoms (Watt and Spence, 1986). In general, lipomas do not undergo malignant change, in spite of several reports of such, which Enzinger and Weiss (1983) found unconvincing.

In the temporal bone region, lipomas are exceedingly rare. Thirteen cases of cerebellopontine angle lipomas have been reported (Pensak *et al.*, 1986). Within the substance of the temporal bone, one case of primary intravestibular lipoma has been reported in a 35-year-old woman in Taiwan (Republic of China) discovered unexpectedly during a destructive procedure for intractable vertigo (Huang, 1989). Two cases of middle ear lipomas have been reported in world literature. In the first case (Stegehuis *et al.*, 1985), the middle ear lipoma in a 64-year-old Caucasian lady in New Zealand, was so huge that it extended through the eustachian tube and the nasopharynx into the oropharynx causing airway obstruction. The second case (Selesnick *et al.*, 1990) was a four-year-old Caucasian girl in New York with an atretic left ear who was found to have a middle ear effusion in the right ear. Both tumours were found to have arisen from the anterior epitympanum. The following is a report of the first case of middle ear lipoma in the UK.

Case report

A five-year-old Caucasian boy with severe speech and language difficulties was referred to our team for joint management having been evaluated by the Nuffield Hearing and Speech Centre, London. His hearing was assessed to be within normal limits although his parents would not concur with this. In Nuffield's assessment, the boy was noted to have a small mass showing through the antero-superior segment of the tympanic membrane. A CT scan was performed prior to our assessment which revealed the mass to be situated in the anterior mesotympanum adjacent to the eustachian tube. As this position is favoured by congenital cholesteatoma, which usually occupies a space bounded by the handle of the malleus, tensor tympani and the processus cochleariformis (Michaels, 1987), this was thought to be the most likely diagnosis and a similar but smaller lesion was also noted in the left ear (Figure 1).

Examination revealed a yellowish, opaque mass showing through the antero-superior segment of the tympanic membrane, which was retracted. The left tympanic membrane was found to be retracted with evidence of middle ear effusion but no evidence of the smaller mass noted on the CT scans. A pure tone



Fig. 1
Computerized axial tomograms of both petrous temporal bones showing bilateral anterior epitympanic masses (arrowed).

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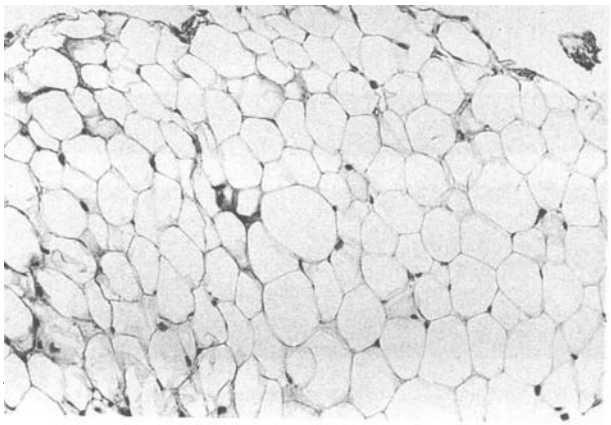


FIG. 2
Histological section of the right middle ear biopsy showing mature adipose tissue. (H & E; × 250).

audiogram showed bilateral 20 dB air conduction thresholds and tympanometry gave flat traces on both sides. Examination under anaesthesia was carried out. It was decided at that stage to treat the bilateral middle ear effusions and not to interfere with the possible cholesteatoma. Serous fluid was aspirated from both ears and Shah grommets were inserted bilaterally. The boy's hearing was noted to be improved (by his parents) despite an apparently unimproved audiogram post-operatively: the boy's responses were noted to be erratic. Our patient's speech and language development continued to improve aided by our colleagues in audiophonological medicine.

Twelve months following his insertion of grommets, his hearing had deteriorated. Clinically, he was found to have a recurrence of the bilateral middle ear effusions with the grommets extruded. The mass in the right ear seemed to have enlarged and extended more inferiorly than before. It was also more obviously yellowish in contrast to the typical white pearl of a congenital cholesteatoma. No lesion was observed on the left side. A pure tone audiogram showed a 40 dB conductive hearing loss on the right side and a 30 dB conductive loss on the left. The tympanometric traces were flat bilaterally.

Both ears were examined under anaesthesia at the same time as adenotonsillectomy was performed for obstructive symptoms and significant recurrent tonsillitis. On the right side, an extended myringotomy was made antero-superiorly over the inferior portion of the mass and mucoid glue was aspirated. A yellowish mass with a noncystic, polypoid, consistency was found to be occluding the eustachian tube. Multiple piecemeal biopsies were carefully taken with micro-cup forceps reducing the size of the mass, thus clearing the eustachian tube opening. It was apparent that the origin was from high in the anterior epitympanum but this was not traced. A Shah permavent tube was inserted. On the left, no obvious tumour could be seen clinically, and an antero-inferior myringotomy allowed aspiration of some serous fluid which was followed by insertion of a Shah grommet.

Macroscopically the specimen consisted of six small fragments of soft yellow-grey tissue. All fragments were processed, embedded in paraffin wax and sections cut to 5 μm. These were stained with haematoxylin and eosin. The histological features are of mature adipose tissue, with no atypical features (Figure 2).

The patient's post-operative course was uneventful with instant improvement in his hearing to within normal limits. It was felt unnecessary to excise the lipoma *via* a tympanotomy at this stage as the histopathology and its benign nature had been established and the patient was symptom free. His ears will be closely watched in the out-patient clinic and appropriate intervention instituted if necessary.

Discussion

Middle ear lipomas are exquisitely rare with this case representing the third such reported. This is no surprise as Michaels (1987) makes no mention of the presence of adipose tissue within the normal middle ear mucosa. The lipoma must have originated from immature mesenchymal tissue or from metaplasia of connective tissue. Akaan-Penttila (1982) in his study of twenty live and stillborn infants (25–40 weeks gestational age) demonstrated the presence of subepithelial primitive mesenchyme in the middle ears of younger subjects. This is a possible origin of the lipoma and, if so, it was probably in existence in our patient at birth. It is interesting to observe that in all three cases reported, the lipomas appear to have originated from the anterior epitympanum and were drawn to the eustachian tube opening. The anterior epitympanum may well be a site favoured by primitive mesenchyme if present. In our case, the lipoma occluded the eustachian tube contributing to its existing functional deficit. Although the lipoma mimicked a congenital cholesteatoma as did the case in New York (Selesnick *et al.*, 1990) because of their antero-superior position, its origin is actually higher than that of a congenital cholesteatoma which occupies the space bounded by the handle of the malleus, the tensor tympani and the processus cochleariformis as described by Michaels (1987).

Our biopsies have reassured us as to the benign nature of the tumour. The first reported case of adipose tissue mass in the middle ear was a liposarcoma arising from the mastoid in a four-year-old child (Agarwal *et al.*, 1975). Fortunately, this is the only reported case. A lipoma should not undergo malignant change. Our patient is now hearing well and his speech and language continue to improve. The lesion in the opposite ear on CT evaluation is most likely to be a small lipoma although this lesion is not clinically obvious. Careful follow-up is the most appropriate strategy at this stage. The lipomas will be excised if symptomatically indicated and this should be easier to undertake when the patient is older.

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