TYMPANIC BODY TUMOURS

By J. I. MUNRO BLACK (Newcastle-upon-Tyne)

IT is now accepted that there occur in the middle ear tumours of similar or identical structure to that of carotid body tumours. As an explanation for this similarity it has been suggested that they arise from collections of cells of the same nature as the carotid body itself, which can be found in close association with the walls of the tympanum. When searched for in serial sections these collections of cells will, in about half of the specimens, be found in the adventitia of the jugular bulb just below the cellar of the tympanum, and in the remainder, in association with the tympanic branches of the vagus and glossopharyngeal nerves. The name glomus jugulare has been suggested for such a collection of cells, but the alternative suggestion of tympanic body is perhaps better as comparable with the carotid body itself.

When discussing the pathology of such a tumour one must think not only of the histological appearance, but of its real nature—what is it, and what does it do? A tumour process arising in such a collection of cells may be expected to have much the same characteristics as a carotid body tumour, and a survey of the literature allows the comparison. Carotid body tumours are now looked upon in the great majority of cases as histologically and clinically benign, although there are some active types. It is very rare for metastasis to occur, but local infiltration of tissues is noted. Usually the rate of growth is very slow, and as a result there is often great delay in seeking treatment, with consequent difficulties in treatment and poorer prognosis. Their danger lies not in their own nature, but in their location and the fact that they are often not seen until adherent to the bifurcation of the common carotid artery. An enthusiastic surgeon may then excise the artery during operation, with consequent serious trouble in many cases.

Likewise in the case of the tympanic body tumours, their danger lies in their situation rather than their nature. The slow-growing majority may be left without adequate treatment, and the actively growing few may produce much local irreparable damage before being treated.

There have now been over fifty cases of tympanic body tumours reported, and an assessment of their nature can be made from a study of these reports.

Nomenclature

In the first publication of one of these tumours it was called a carotid body tumour of the ear. Later the names Glomus jugulare tumour or

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tympanic body tumour were suggested, and also non-chromaffin paraganglioma of the middle ear. The more commonly known tumours in the neck seem now to be called simply carotid body tumours, and it would seem easier to accept also the name tympanic body tumour.

Incidence

The tumour seems to be one of adult life, and no cases have been reported in patients younger than their late teens. The majority seem to begin a little later than this, although they may not be recognized until after many years of slow growth. Case histories of twenty years and more duration are noted. On the other hand, rapidly-growing tumours of short clinical history do occur at all ages. It is more common in females to the extent of at least three-quarters of the cases.

Situation

Probably about half of the tumours appear to arise in the dome of the jugular bulb, and present upwards through the cellar of the tympanum or floor of the external auditory canal. Others may arise from the promontory, and also grow in the tympanum. More rarely, the origins may be near the geniculate ganglion. There are no case reports of bilateral tumours, but coincidence with a tumour of the carotid body is noted. It has been suggested that there is a familial tendency, but this is based on a unique record.

Extension

Most commonly the tumour will fill the tympanum, penetrate the tympanic membrane and present in the external auditory meatus as a polypus. If not treated, expansion of the bone will occur, but growth may be extremely slow. Extension beyond these limits will be along lines of least resistance. Thus, it may spread to the jugular foramen, causing probably a series of nerve palsies, thence along the base of the skull or down into the neck. Also, it may find a path along the eustachian tube towards the nasopharynx. Destruction of the local bone may, of course, expose and paralyse the facial nerve, which has been noted especially in the long-standing and surgically treated cases. Apart from those arising in the tympanum, others are noted which have an intracranial spread, either early, or as a late stage of the advanced case.

Metastasis

Metastasis is extremely rare. Enlarged lymph nodes are noted, but they do not contain tumour. One case of liver metastasis has been described.

Death

If caused by the tumour alone, death seems to be largely due to intracranial extension. Often, however, like the carotid body tumour, death

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has resulted from surgical intervention and perhaps secondary sepsis. In many cases, no doubt, the tumour outlives its host, who dies from other causes.

Histology

The varieties of clinical behaviour are reflected in the histological picture. Ordinarily the tumour is composed of nests of cells surrounded by a very vascular stroma. Well-formed, fairly large cells and reasonably good blood vessels, suggest a benign type. Rather more growth activity is suggested by smaller cells with darker nuclei, and most activity by great variation in cell size with large irregular dark nuclei. It is unusual to see mitoses even in actively growing tumours with marked cell irregularity. If the tumour becomes polypoid the vascular spaces may be dilated and a very loose structure occur with the cells spread out, and a resultant appearance similar to granulation tissue.

Clinical Picture

Usually there is a long story of some trouble with the ear involved, pulsing tinnitus and deafness, but no pain and no otorrhœa. Diagnosis depends upon clinical examination, when usually an extremely vascular and perhaps sessile polypus will be noted, or if found earlier in its life the tumour will be seen in the tympanum shining through the tympanic membrane. Later, and particularly after surgical intervention, the appearance will be that of chronic otitis media with particularly vascular granulation tissue, or of epithelioma, and may be diagnosed as either, pending histological examination.

The more actively growing tympanic body tumour will present like a malignant neoplasm, and after only a short clinical history will already have produced much local damage and perhaps nerve palsies. A more rare type presents as an intracranial neoplasm, and there may be little in the tympanum to show for it.

Untreated Prognosis

This can be assessed from the clinical picture at the time of examination and the length of history of local trouble. That is, how long has it taken to do so much local damage, and, thus, how much longer might it take to produce dangerous local damage ? Careful X-ray of the petrous bone should help to assess this local damage. Histological examination will be essential, and should, apart from confirming or otherwise the clinical diagnosis, give some idea of expected future behaviour if left alone.

Treatment

Treatment can be discussed only on the basis of untreated prognosis. Thus, in the earliest cases where the tumour is confined to the tympanum

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and visible only through an intact membrane, a long period of observation is justifiable. If growth is proceeding, excision would be wise as easier at this early stage, and likely to leave as little operative damage as possible. Where growth is very rapid, the neoplasm may be radiosensitive, and even if it can only be stopped growing, that may be enough. Operation will be difficult owing to the very profuse hæmorrhage, but if begun must be persisted in until the likely roots of origin of the tumour have been excised.

Treated Prognosis

In the majority of cases this should be good as far as life is concerned, although an ultimate attributable death-rate of 34 per cent. is quoted. It is too early yet to judge as regards local cure. Most of the cases quoted of long duration were inadequately treated, and the tumour remained *in situ*, although benign. No doubt earlier diagnosis and treatment will now offer a better treated prognosis.

Illustrated Cases

CAROTID BODY TUMOURS

Fig. 1 and Fig. 2 show the great variation in histological picture which may be found in carotid body tumours, not only in separate tumours but also within the confines of a single tumour. Fig. 1 is more like the typical structure of nests of cells with a vascular stroma. Another type consists of larger sets of cells, more like epithelium and with little reticulum, which has been called the adenoma type. Where there are a lot of capillaries with the cells grouped around them, the name angioma type has been applied. Seeing that we find such a variation of structure in known carotid body tumours, we may expect a similar variation in tympanic body tumours.

TYMPANIC BODY TUMOURS

CASE I. (FIG. 3.)

Histology: Very similar to Fig. 2. Large vascular channels with the typical cells scattered in between.

Case History: Male. Aged 33.

January, 1950. Deafness and tinnitus left ear for eight months. No otorrhœa.

Lesion. Very red polypus fills the left external auditory canal—coming up through its floor. Bleeds on touching.

Biopsy. Polypus removed—extremely profuse bleeding. Histology of tympanic body tumour.

February, 1950. Endaural mastoidectomy. Mastoid air cells normal. Neoplasm removed—coming up through floor of tympanum and deep meatus.

June, 1950. Operation—postaural incision. Enlarged lymph node removed. Histology of chronic lymphadenitis. Sigmoid sinus non-pulsatile and devoid of blood flow. Incision in neck—jugular vein collapsed and empty.

January, 1952. All well.

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ILLUSTRATED CASES, see page 318.

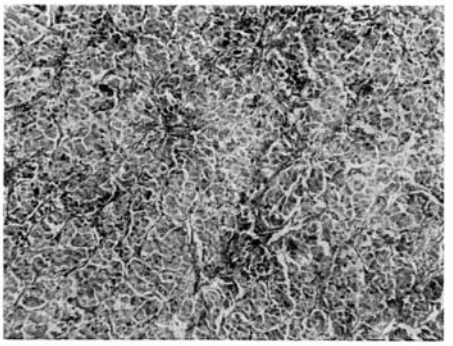


FIG. 1

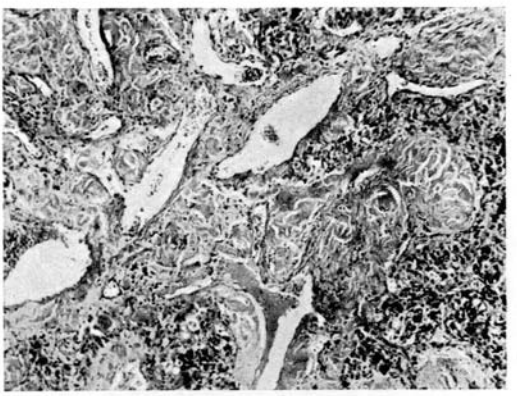


FIG. 2

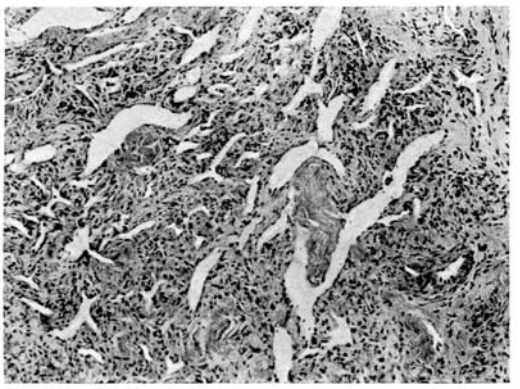


FIG. 3

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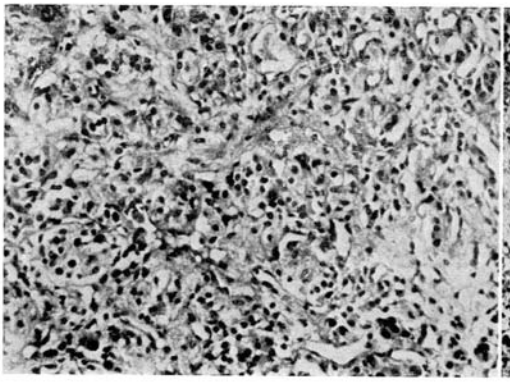


FIG. 4

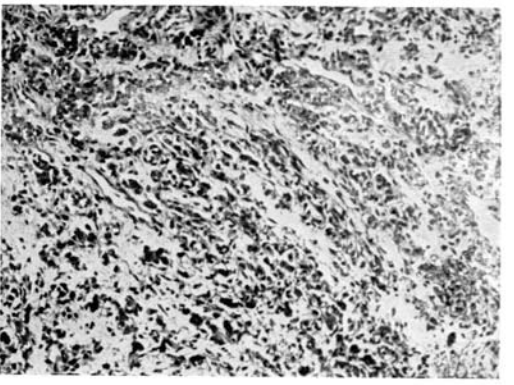


FIG. 5

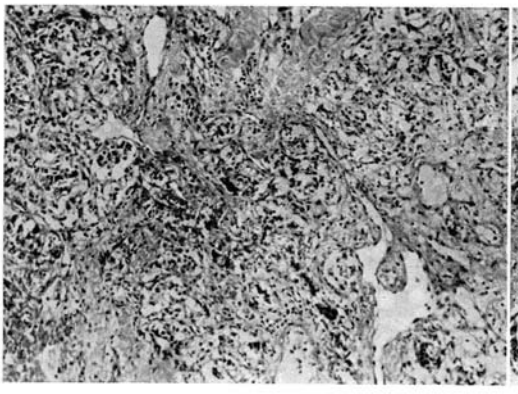


FIG. 6

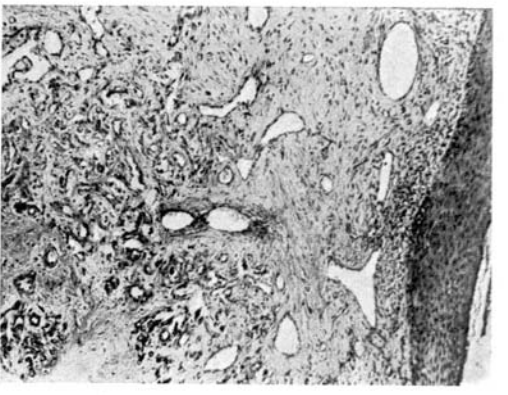


FIG. 7

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CASE II. (FIG. 4.)

Histology: Largely made up of polyhedral cells closely packed, vascular spaces small.

Case History: Female. Aged 49.

July, 1950. Irritation, deafness and throbbing in right ear for three months.

Lesion. Red polypus in right external auditory meatus, coming up through the floor.

Operation—Removal of polypus: profuse bleeding. Histology of tympanic body tumour.

January, 1952. Residuum of tumour evident in floor of meatus, probably external to tympanic membrane. For excision later.

CASE III.

Not illustrated owing to the great similarity to the case shown by Mr. Capps with such a good coloured picture.

Case History: Female. Aged 52.

August, 1950. Tinnitus and deafness right ear for several years.

Lesion. Red mass visible inside of the lower anterior part of the right tympanic membrane. Found to have attended in July, 1945, and noted as identical lesion then.

January, 1952. Probably unchanged. Advised remove tumour at a later date.

CASE IV. (FIG. 5.)

Histology: Very like Case II.

Case History: Female. Aged 69.

November, 1932. Pulsation and deafness in right ear for about ten years. Polypus removed seven years ago, and later cautery applied. Mastoidectomy about five years ago with facial palsy.

Operation—Granulations removed and radium applied.

June, 1949. Removal of polypus. Histology of tympanic body tumour.

January, 1952. Still has some tumour in floor of meatus.

CASE V. (FIG. 6.)

Histology: A rather more vascular type.

Case History: Female. Aged 46.

February, 1946. Large hæmorrhagic polypus in left radical mastoidectomy cavity. Operation about seventeen years ago. Removal of polypus two years ago caused serious bleeding.

Operation—Removal of polypus: profuse bleeding. Local radium. Histology of tympanic body tumour.

May, 1947. Died. Probable intracranial hæmorrhage.

CASE VI. (FIG. 7.)

Histology: From a superficial part of the polypus. Very vascular and suggestive, but not certain of tympanic body tumour.

Case History—Male. Aged 44.

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Known to have had some trouble with the left ear at least fifteen years ago. A red swelling noted behind the tympanic membrane. About ten years ago had excisions of carotid body tumour from left side of neck. Three years ago a very hæmorrhagic polypus was removed from the ear, the histology of which is illustrated.

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