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The changing faces of a parotid mass

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Abstract
The development of a neurofibroma in the temporal and parotid regions of the facial nerve is rare. We report a case occurring in a 32-year-old male, where the initial presentation was a parotid mass. Cytologically this was initially thought to be a pleomorphic adenoma. However, the diagnosis was then changed to a schwannoma and finally a neurofibroma after complete excision of the lesion. The case illustrates how fine needle aspiration cytology under ultrasound guidance, and even histological examination of an incision biopsy can sometimes fail to give the correct diagnosis. In this case magnetic resonance imaging was used to help plan definitive surgery.

Key words: Neurofibroma; Facial nerve; Parotid gland

Introduction

A mass in the parotid gland is likely to be benign in 80 per cent of cases, and 80 per cent of these will be pleomorphic adenomas. Thus, investigation will usually involve ultrasound and fine needle aspiration cytology. Other benign tumours, including neurogenic facial nerve tumours are uncommon. Those which involve both intratemporal and intraparotid sites are very rare. Such 'dumbell' tumours have been described by Shambaugh *et al.* (1969), Cawthorne (1969) and Neely and Alford (1974). There are two main benign varieties of such tumours, namely schwannomas and neurofibromas. Facial nerve schwannomas were first reported by Schmidt in 1930 and their presentation as parotid masses has been reported in the medical literature. Elahi *et al.* (1995) presented a case with a literature review and stated that theirs was the 56th case reported in the English literature. The only case report of a schwannoma developing within a neurofibroma of a cranial nerve came from Kayem *et al.* (1995).

Schwannomas are benign and slow growing lesions, that arise from the Schwann cells that ensheath axons of the peripheral, cranial and autonomic nervous systems (Thawley and Panje, 1979). Most occur in the central nervous system and facial nerve schwannomas, particularly extratemporally are very rare (Shambaugh *et al.*, 1969). Although most facial nerve tumours are benign schwannomas, malignant schwannomas and cellular schwannomas have been reported (Conley and Janecka, 1974; White *et al.*, 1990).

Neurofibromas usually occur as part of von Recklinghausen's disease (Neely, 1974; Batsakis, 1979), but may also occur as solitary or multiple lesions without von Recklinghausen's disease.

Case report

A 32-year-old Asian male presented to general surgical colleagues with a mass in the region of the right parotid gland which was increasing in size. Fine needle aspiration cytology was performed and the patient referred for definitive ENT management. Cytological examination results were inconclusive and the investigation was repeated under ultrasound guidance. Ultrasound imaging demonstrated a mass in the superficial lobe of the parotid gland and repeat cytology suggested a pleomorphic adenoma. The condition was explained to the patient and after discussion of the potential complications he underwent a superficial parotidectomy.

At surgery, via a McCabe Work incision, the position of the mass precluded identification of the main trunk of the facial nerve, and so a retrograde approach was adopted. The marginal mandibular branch of the facial nerve was identified and traced towards the main trunk, but could only be traced as far as the mass. Upon using the nerve stimulator on this mass, movement of the face was

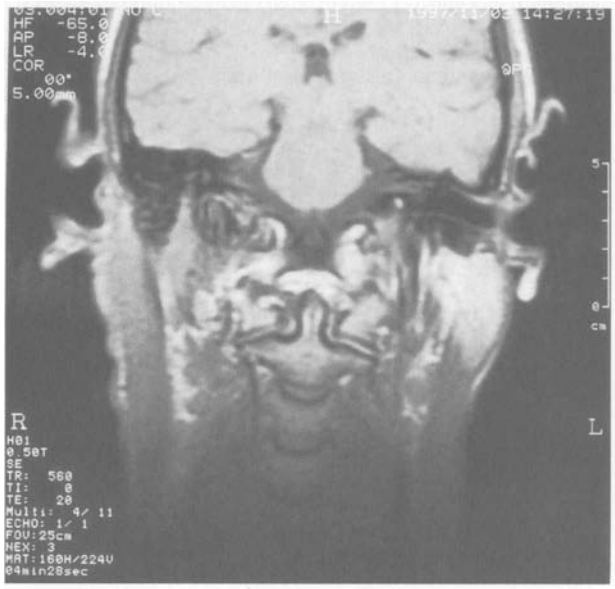

FIG. 1
Magnetic resonance image showing right facial nerve mass extending from the mastoid portion to the second genu.

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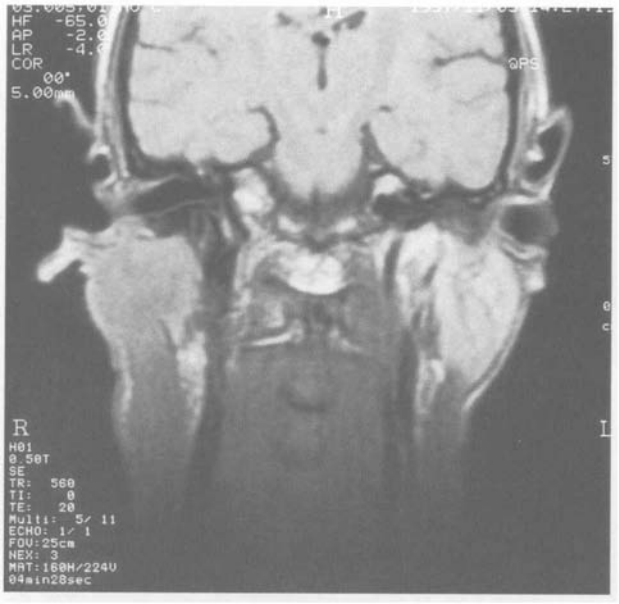

FIG. 2

Magnetic resonance image showing a facial nerve mass in the right parotid region.

observed. Thus it appeared that the mass, which extended up to the stylomastoid foramen was a facial nerve tumour. A biopsy of a non-stimulating area of the mass was performed and the great auricular nerve, as well as the mass, were marked with prolene sutures for future easy identification, before closing the wound in the usual manner.

Post-operatively, the patient underwent magnetic resonance imaging of the facial nerve which showed tumour extending from the parotid up to the second genu of the facial nerve within the middle ear via the stylomastoid foramen (Figures 1 and 2). Histological examination of the intra-operative biopsy suggested the mass was a facial nerve schwannoma (Figure 3).

Despite the benign nature of the pathology, in view of the rapid increase in size and extent of the mass it was felt appropriate to proceed to definitive resection of the mass. After careful further explanation to the patient, he underwent complete excision of the lesion including the involved portion of the facial nerve with a nerve graft using the previously identified great auricular nerve, and a lateral tarsorrhaphy. Histological examination of the specimen showed it to be a neurofibroma (Figure 4). Seven months post-operatively, the patient is doing well.

Discussion

This case illustrates the fact that even with ultrasound-guided fine needle aspiration cytology the diagnosis of a benign schwannoma or neurofibroma can be difficult. It is thought that the cells are securely attached in tumours of neurogenic origin, and that this is the reason for difficulties with fine needle aspiration cytology (Bretlau *et al.*, 1983).

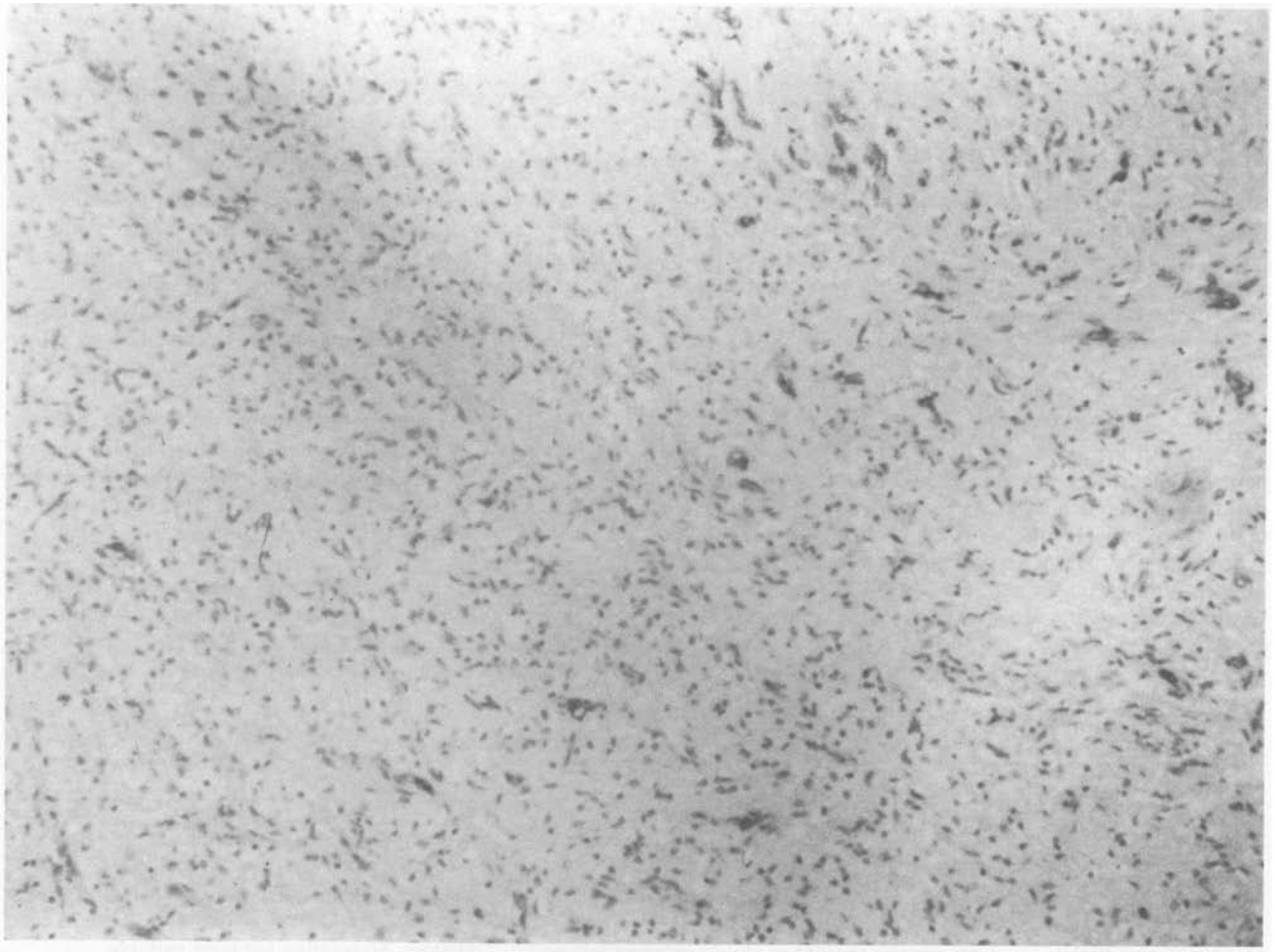

FIG. 3

Incisional biopsy suggestive of a facial nerve schwannoma (H & E; × 40).

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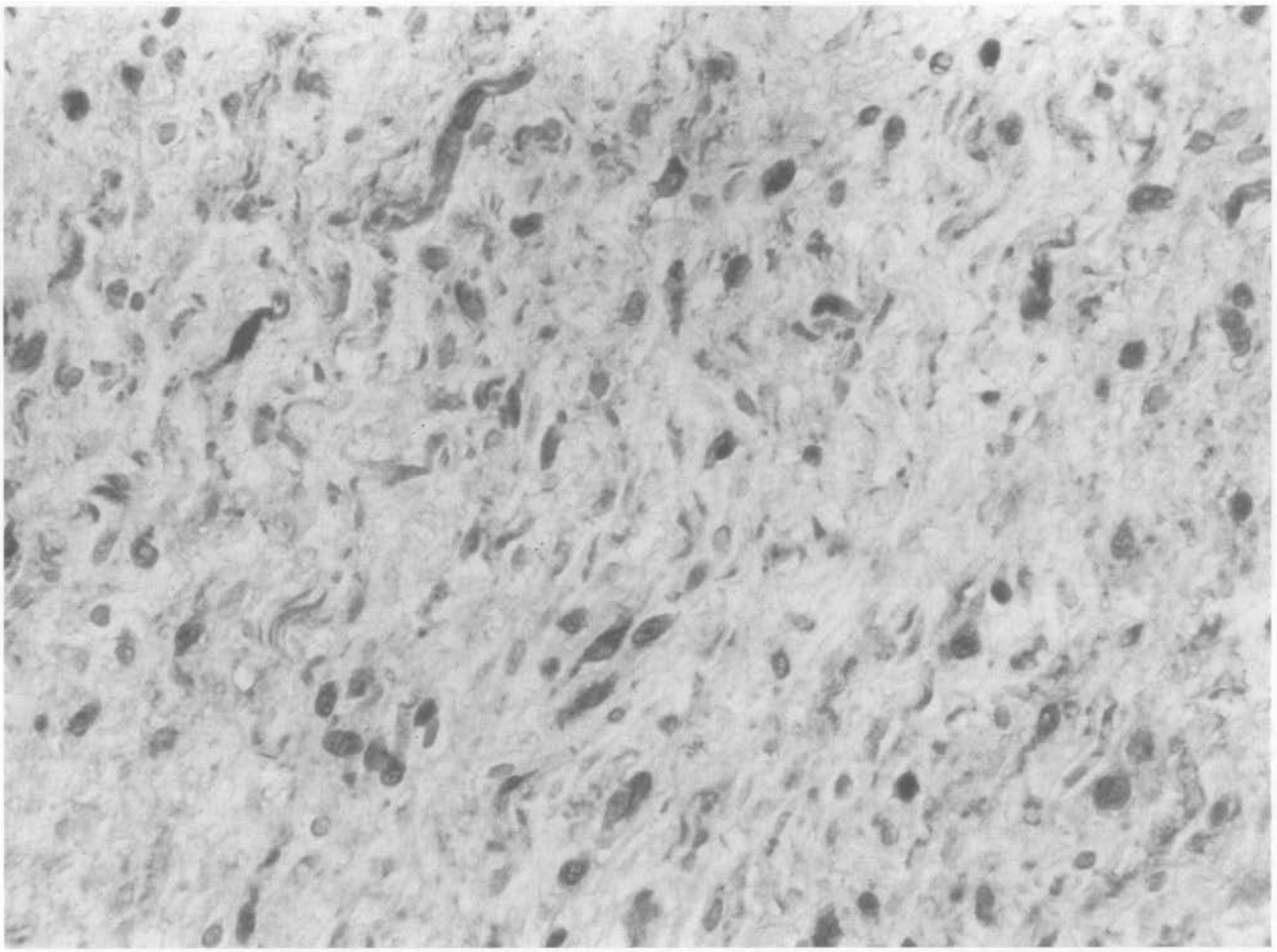

FIG. 4

S100 staining of excision biopsy showing features of a neurofibroma (× 200).

Som *et al.* (1984) state that the specific histology of parotid region masses cannot be confidently obtained from imaging studies alone, and so clearly some form of biopsy is necessary. We need to remember, however, that neurogenic tumours in this region are rare. In the words of Conley and Janecka (1973) 'the incidence of a neurogenic tumour of the facial nerve in the differential diagnosis of parotid gland masses is so low, that their pre-operative diagnosis can be no more than chance speculation'.

Table I shows some features of schwannomas and neurofibromas. About 25 to 45 per cent of schwannomas occur within the head and neck region, outside the central nervous system (Kyriakos, 1987). Solitary schwannomas arise sporadically in patients with no evidence of a genetic predisposition (Hardin and Reed, 1969). There appears to be no sex or race bias (Elahi *et al.*, 1995). It is reported that only 20 per cent of intraparotid schwannomas have facial nerve paresis or paralysis (Bretlau *et al.*, 1983).

Sullivan *et al.* (1987) reviewed the literature and found only 56 cases of primary neurogenic tumours involving the intraparotid facial nerve. Most of these were schwannomas. Katz *et al.* (1971) described the occurrence of a solitary neurofibroma involving the peripheral branches of the facial nerve and Maxwell (1951) described one of the main trunk. Both of these cases had normal function of the facial nerve at presentation.

The management hinges around facial function (Sullivan *et al.*, 1987). The rare malignant tumours require surgical excision with adequate margins, and so any mass with facial weakness must be biopsied. However, benign tumours may also cause facial weakness (Conley and Selfe, 1981).

Management of benign lesions with no facial weakness is more difficult. If left, a weakness may develop through compressive effects as the tumour enlarges. Fisch (1977) is in favour of surgery prior to this stage as he feels that the

TABLE I

FEATURES OF SCHWANNOMAS AND NEUROFIBROMAS

Feature	Schwannoma	Neurofibroma
Morphology	Encapsulated and single	No capsule and usually multiple
Histology	Cellular and oedematous areas alternate (Antoni A and Antoni B)	Scant and haphazard delicate spindle cells in loose collagenous matrix
Relation to nerve	Attached to or surrounded by nerve	May incorporate nerve fibres so nerve sectioning is required to remove tumour
Malignant potential	Low, usually present as slowly growing lesions without neurological symptoms	Higher. Association between multiple neurofibromatosis and sarcoma. More risk in deep tumours in male subjects (Sullivan, 1987)

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results of facial nerve reconstruction are better. May (1986), on the other hand, believes that resection should not be performed where the evidence is of a benign lesion (intra-operative appearance, inseparability from the facial nerve and facial movement elicited by electrical stimulation of the tumour). Sullivan *et al.* (1987) agree with this except for intratemporal lesions where compressive problems are more likely. In our case of a large 'dumbell' tumour with increasing size of the mass, excision and grafting was felt to be the correct management.

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