a dowal graft being pushed into the canal (case 14), or follow upon pseudo-arthrosis from a posterior fusion (case 15), with resulting bony hypertrophy. In cases of successful fusion, but with marginal canal, degeneration of the disc just above the fused levels, may be the factor triggering this silent stenosis into a symptomatic one. This might make out a case for assessment of the canal diameters before fusion.

RESULTS

This is a short-term appraisal (Table I), and is not regarded as the final evaluation. One case was a complete failure, probably due to inadequate decompression. Seven cases were regarded as having a good result, their symptoms being improved, but still having minor neurological signs or symptoms. Twelve cases had an excellent result, as both their symptoms and signs were vastly improved postoperatively.

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REFERENCES


Granular Cell Tumours of the Larynx*

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SUMMARY

The larynx is an uncommon site for granular cell tumours (granular cell myoblastoma). To date just over 60 cases have been recorded in the world literature. We wish to report 2 further cases and discuss the histogenesis, natural history and treatment of this tumour.


CASE REPORTS

Clinical History

Case 1: A 56-year-old Coloured female presented with an acute external ear canal furunculosis, and on routine examination was found to have a smooth swelling of the posterior third of the left vocal cord. This was incompletely removed in January 1969, and by June 1969 it had enlarged to its original size. On this occasion it was completely removed by endolaryngeal microsurgical dissection. Her voice, which had been hoarse for 3 years before surgery, returned to normal. To date there has been no evidence of recurrence.

Case 2: A 37-year-old Coloured female presented with a 4-year history of hoarseness of voice, and a 2-month history of discomfort in her throat on swallowing. There were no other relevant symptoms. Clinical examination showed only a small diffuse goitre. On indirect laryngoscopy, a smooth, dome-shaped swelling lying behind the left arytenoid was visible; the larynx was otherwise normal, and both vocal cords were mobile. In March 1972, a 1 x 1.5 cm tumour was removed by endolaryngeal microsurgical excision. The hoarseness and dysphagia disappeared within 1 month, and she has remained asymptomatic for the past 5 months.

*Date received: 20 September 1972.

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Pathology

Macroscopic: The excised tissue from case 1 consisted of irregular fragments measuring up to 1.0 cm in maximum dimension, with no distinguishing features. That from case 2, consisted of a dome-shaped nodule measuring 0.6 cm in diameter and having a smooth epithelial-lined surface. The cut surface had a tan colour.

Microscopic: Both lesions showed similar histological features. They both took the form of circumscribed projecting nodules, covered on the one surface by intact normal-looking squamous epithelium. The deep margins were free of tumour. Although circumscribed, the tumours were not encapsulated, and at their periphery merged with the surrounding tissues and incorporated mucous glands (Fig. 1). The cells comprising this lesion were fairly uniform, but varied in shape; some were polyhedral, others round or oval, and yet others strap-like, superficially resembling muscle cells (Fig. 2). The nuclei were rounded and vesicular and had a uniform appearance. The most distinguishing feature in all the cells was the presence of prominent eosinophilic granules in their cytoplasm. The granules filled the entire cytoplasm and varied in size; some were quite coarse, and others of a finer texture. They were strongly periodic acid Schiff-positive and resistant to prior treatment with diastase. Within the strap-like cells, cross striations and myofibrils were not seen (Fig. 3). Mitoses were not present.

Fig. 1. Dome-shaped tumour mass with intact covering of squamous epithelium above. Entrapment of ducts and acini of mucous glands is shown in the left lower corner (H. and E. x 16).

DISCUSSION

It has been cited that granular cell tumour (GCT) was first recognized by Weber in 1854, and has since been described in a variety of organs. Its occurrence in the larynx was not documented until 77 years later.

Since its detailed description by Abrikossoff, many reports have appeared discussing the histogenesis and nature of this lesion. This is reflected in the many synonyms that have been applied to this lesion, viz. granular cell myoblastoma, myoblastic myoma, granular cell neurofibroma, granular cell schwannoma and lipid thesaurismosis. The cell of origin has been variously ascribed to skeletal muscle fibres, fibroblasts derived from the endoneural or perineural cells, histiocytes, mesenchymal cells and Schwann cells. All electron microscopic studies of the lesion have demonstrated the presence of polymorphous intracytoplasmic granules, having vesicular, granular amorphous and vacuolar elements. While these appear to be a distinctive feature of the cells, they have not helped in elucidating the histogenesis of the lesion. In some of these tumours, actin-like filaments have been demonstrated in the cytoplasm, suggesting a myogenic origin. However, other studies have demonstrated that the tumour cells have axon-like cytoplasmic processes, prominent infoldings of the plasmalemma, as in Schwann cells, and intracytoplasmic structures resembling myelinated axons. Recently Christ and Ozzello reported
three GCTs, two of which showed ultrastructural features consistent with a Schwann cell origin, while the third had myofibrils in the cytoplasm. They therefore concluded that the GCT may in fact originate from more than a single cell type. In addition to the problem of its histogenesis, the basic nature of the lesion is also obscure. It has been variously considered to be degenerative, metastasizing, or neoplastic. The rare occurrence of metastasizing GCT indicates that at least some of the lesions must be true neoplasms.

To date just over 60 laryngeal GCTs have been documented. Clinically this lesion may resemble a variety of other benign laryngeal lesions, e.g. cysts, polyps and granulomata. Symptoms include dysphonia, dyspnœa and rarely dysphagia, respiratory obstruction and stridor.

In a large review of laryngeal GCTs, the following sites were involved in decreasing order of frequency: posterior third of the vocal cord (24), arytenoid (15), supraglottis (6) and subglottis (3). They occurred twice as commonly in males as in females. Although presenting at any age, the peak incidence was in the fourth decade. Only 5 cases have been recorded in children of 16 years or under, and no hereditary predisposition has been observed. Multiple tumours in the same patient, involving both the larynx and other sites, have been documented, viz. larynx, chest wall, axilla and floor of mouth, and larynx and base of tongue.

The histological diagnosis usually presents no great difficulty. Typically the tumour cells are arranged in strands and groups, embedded in a variable amount of collagen or reticulin. They are large and show a distinct relationship to the overlying larynx epithelium. The cytoplasm is characterized by the presence of eosinophilic granules which fill the cytoplasm. The granules are periodic acid-Schiff-positive and are resistant to prior treatment with diastase.

An interesting and at times disquieting feature is the presence of an associated pseudocarcinomatous hyperplasia of the overlying squamous epithelium. This occurs in about 50% of cases. Goldstein et al. have reported a case in which a GCT and a squamous carcinoma coexisted in the same larynx, the squamous carcinoma being present on the left true cord, false cord and epiglottis, while the GCT was present on the right false cord. This indicates the difficulty that may arise in distinguishing pseudocarcinomatous hyperplasia from true carcinoma occurring in association with a GCT. We believe that biopsy specimens including epithelium peripheral to, and not merely overlying the GCT, may help to distinguish pseudocarcinomatous hyperplasia from true carcinoma.

The treatment of this laryngeal lesion is purely surgical. Resection with the aid of suspension laryngoscopy and the operating microscope is the treatment of choice for most lesions. In some cases a laryngofissure may be required. Incomplete excision may be followed by recurrence of the lesion, as seen in case 1. Periodic follow-up examination of the larynx is necessary, and is advisable for at least 3 years after removal of the original lesion. Irradiation is said to be of no value. In a case described by MacNaughton and Fraser 2200 rads of teleradium was found to be of no avail in the treatment of a recurrent GCT.

To date we are unaware of a malignant GCT of the larynx, and the prognosis after adequate excision is excellent.

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REFERENCES