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Pathology in Focus

Intra-parenchymal thyroid epidermal cyst presenting with a left recurrent laryngeal nerve palsy

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Abstract
We present a rare case of an intra-parenchymal thyroid epidermal cyst presenting with a left recurrent laryngeal nerve palsy. There was a complete recovery of the nerve function following surgical excision of the lesion. Theories of aetio-pathogenesis of the cyst and underlying mechanisms responsible for the nerve paralysis are explored.

Key words: Recurrent Laryngeal Nerve; Epidermal Cyst; Thyroid Gland

Introduction

Paralysis of the recurrent laryngeal nerve is rarely found with benign disease of the thyroid gland. In a series of recurrent laryngeal nerve paralysis, only 2.3 per cent were associated with benign conditions.[1] Here, we report a man who presented with a left recurrent laryngeal nerve palsy and a neck mass in whom the pre-operative findings were suggestive of a malignant lesion. The histopathological finding was of a benign intra-parenchymal thyroid epidermal cyst. Despite an extensive search of published reports, we have not been able to find a similar case.

Case report

A 60-year-old male Indian presented to our department with a three-year history of an intermittent dysphonia. In the two weeks prior to presentation, his voice had significantly deteriorated and he had noticed a left-sided neck lump, which was gradually increasing in size, associated with occasional discomfort. There was no associated dyspnoea or dysphagia. He had no systemic symptoms and no previous medical history. Clinical examination revealed a hoarse patient with a left-sided neck mass which moved on swallowing. There was suggestion of a retrosternal extension and displacement of the trachea to the right. Flexible nasendoscopy revealed a left vocal fold paresis with the fold in the paramedian position. There was no associated palpable cervical lymphadenopathy. The clinical findings at that stage were suggestive of a malignant lesion.

An ultrasound of the neck demonstrated a 3×3 cm well-circumscribed hypoechoic lesion within the left lobe of the thyroid extending retrosternally. Surrounding this was an area of marked heterogeneity with evidence of vascular flow on Power Doppler. Magnetic resonance imaging (MRI) of the neck (Figures 1 and 2) revealed a

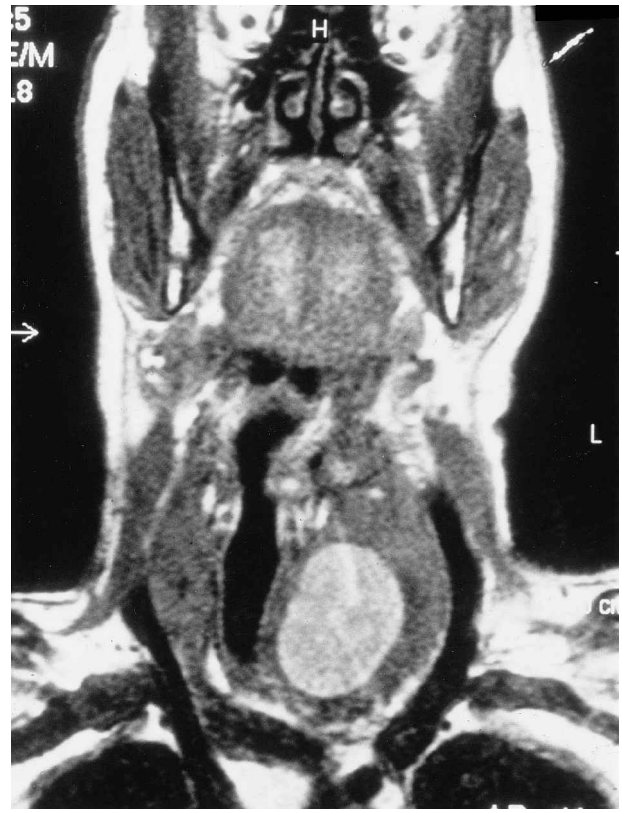

Fig. 1
Coronal T1-weighted MRI scan showing mass centred on left lobe of thyroid with displacement of the trachea to the right.

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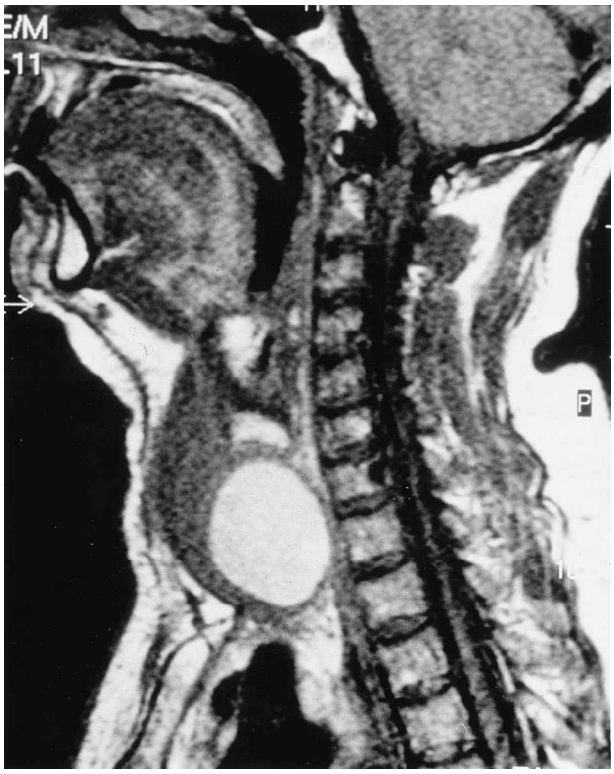

FIG. 2

Saggital T1-weighted MRI scan showing a very well defined 5 cm diameter high signal area consistent with a cyst.

large mass centred on the left lobe of the thyroid. At its centre was well-defined 5 cm diameter high signal area, that could represent a cystic component. Surrounding this was a much more ill-defined mass of T1 intermediate, T2 high signal. Inferiorly, the mass extended just below and posterior to the superior aspect of the manubrium. The left common carotid artery and internal jugular vein were displaced laterally. The trachea was displaced to the right and slightly narrowed. An attempt at diagnosis using fine needle aspiration cytology proved inconclusive. Other routine haematological investigations including thyroid function tests and a chest X-ray were all normal. Neck exploration was scheduled. A thyroid incision was performed with mid-line dissection of the strap muscles. It then became evident that there was a large cystic mass with a necrotic centre in the left thyroid lobe extending to surround the trachea and internal jugular vein, displacing the carotid artery posteriorly. The left recurrent laryngeal nerve could be identified caudal to the thyroid lobe and was safely dissected from the mass. Following separation of the mass from the trachea and full mobilization, a left thyroid lobectomy was performed. Histopathological analysis revealed thyroid gland containing an epidermal cyst. The cyst was partly denuded of an epithelial lining; instead bordered by inflamed fibroblastic and granulation tissue. Where present, the cyst lining was composed of stratified squamous epithelium (Figure 3). Beyond the cyst was fibrosis and atrophy of thyroid parenchyma (Figure 4). There was no evidence of neoplasia. The contents of the cyst were sterile on microbiological examination. The post-operative period was uncomplicated. A formal swallowing assessment prior to discharge was normal. The patient was discharged three days post-operatively with a significant improvement in his voice and resolution of his other symptoms.

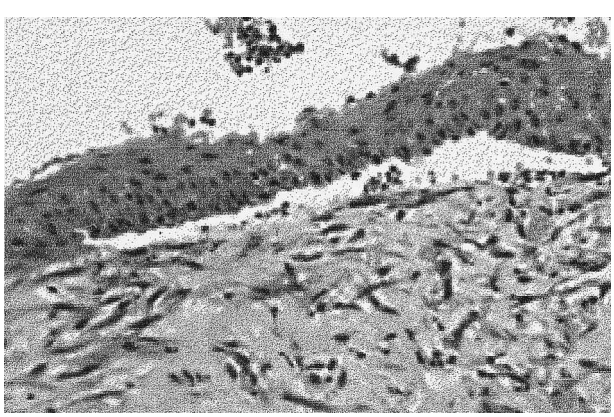

FIG. 3

Photomicrograph demonstrating the stratified squamous epithelium lining the cyst (H & E; ×200).

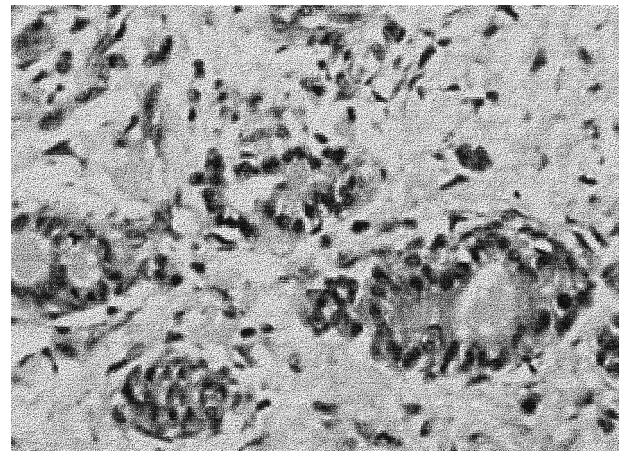

FIG. 4

Photomicrograph showing fibrosis and atrophy of thyroid parenchyma (H & E; ×200).

At follow-up, two weeks after the operation, flexible nasendoscopic examination of the larynx revealed sluggish movement of the left vocal fold with adequate compensation by the right fold producing a near-normal voice that tired with use. On a recent review, six months post-operatively, the patient remained asymptomatic with a complete recovery of his voice. Stroboscopic examination of the larynx was entirely normal with both vocal folds fully mobile.

Discussion

Embryologically, the thyroid gland develops as an out-pouching in the floor of the foregut, between the first and second branchial arches. This out-pouching descends caudally, leaving an epithelial-lined tract in its path, the thyroglossal duct. The tract normally obliterates by the sixth week of foetal life; failure to do so results in the formation of a thyroglossal duct cyst.

The histopathological characteristic features of this epidermal cyst could be a manifestation of a branchial pouch anomaly or a thyroglossal duct remnant. Thyroglossal cysts usually occupy the mid-line. They may be eccentrically placed when too large to occupy the mid-line or when they recur after surgery. However, true lateral thyroglossal cysts are rare.[2] Even rarer are thyroglossal cysts within the substance of the thyroid gland. There have been only two cases, both children, with thyroglossal cysts within the substance of the thyroid gland described in the literature.[3] There have been no reports, to the best of our

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knowledge, of an adult presenting with an intra-parenchymal thyroglossal duct cyst. The only confirmatory evidence that a lesion is a thyroglossal duct cyst histologically is the finding of thyroid tissue in the excised cyst wall. However it has been shown that histological examination of excised lesions shows thyroid tissue remnants in less than 35 per cent of specimens.[4] It thus follows that we cannot exclude the thyroglossal duct remnant possibility in this particular case.

Similarly, brancial cysts commonly arising from the second branchial arch or cleft usually present anterior to the sternomastoid muscle at about the level of the junction of the upper third and lower two thirds. Again, there have been no reports, to our knowledge, of a branchial cyst arising within the thyroid gland parenchyma.

The question then arises of the mechanism of the recurrent laryngeal nerve palsy associated with this lesion. Numerous theories relating recurrent laryngeal nerve paralysis to benign thyroid disease have been proposed including simple stretching of the nerve over the thyroid swelling[5] and calcification or inflammation.[6] Pressure on the nerve between the swelling and the trachea or cervical spine as well as oedema of the nerve trunk and infection have also been included as causal factors.

Stretching of the nerve over a thyroid swelling probably does not occur with normally positioned thyroid glands. However, in the presence of a retrosternal extension, this may well occur particularly on the left side where the recurrent nerve has a much longer course to run. Spread of an inflammatory process beyond the thyroid gland can involve the nerve, as the latter is intimately related to the capsule. During the acute phase, this could be caused by thrombosis of the minute arterial supply, oedema of the nerve or a combination of the two.[7] In the chronic phase, perineural fibrosis might be a more common cause. The relationship of paralysis to calcification is not clear. In the case of haemorrhage into a colloid nodule, this can lead to perinodular fibrosis and calcification in the wall of the nodule. If the nodule were in close approximation to the nerve, the fibrosis would involve it, producing damage. Removal at an early stage would prevent ensuing permanent damage.

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