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Radiology in Focus

Laryngocele and squamous cell carcinoma of the larynx

M. Harney, N. Patil, R. Walsh, P. Brennan*, M. Walsh

Abstract
We present a case report of a lady with a laryngocele and a squamous cell carcinoma of the larynx. The pathogenesis of the relationship between these two entities is discussed and the literature reviewed. This association means a carcinoma must be outruled if a laryngocele is detected clinically or radiologically.

Key words: Larynx: Diverticulum; Carcinoma, Squamous Cell

Case report

An 80-year-old woman presented with a two-month history of progressive dysphagia and hoarseness, which had been present for a number of years. She smoked 30 cigarettes per day but had no other relevant medical history. A fibreoptic examination of her larynx revealed polypoidal degeneration of her vocal folds. An exophytic lesion was noted involving her right ventricle and right false cord, extending onto the laryngeal surface of her epiglottis. A small, firm mass was palpated on the right side of her neck, in the region of her thyroid.

Upon admittance, a chest X-ray was performed, which was normal. A fine-needle aspirate of her thyroid nodule revealed a benign colloid nodule. CT scans showed the presence of a large laryngocele, extending up to the level of the hyoid bone, with both an internal and external component, with an adjacent thickened aryepiglottic fold (Figure 1). The tumour mass extended inferiorly to the right ventricle, with the proximal end of the laryngocele visible at this level (Figure 2). A right-sided thyroid mass was also identified (Figure 3). The patient underwent urgent panendoscopy confirming the presence of a large exophytic supraglottic tumour. There was no involvement of the glottis or subglottis. The tumour was debulked with CO_2 laser, and biopsy specimens sent for analysis. The laryngocele was uncapped, revealing mucoid fluid.

Biopsy specimens showed moderately differentiated squamous cell carcinoma, which was graded at $T_2N_0M_0$ (Stage 2). The patient was referred for radiotherapy treatment of her tumour.

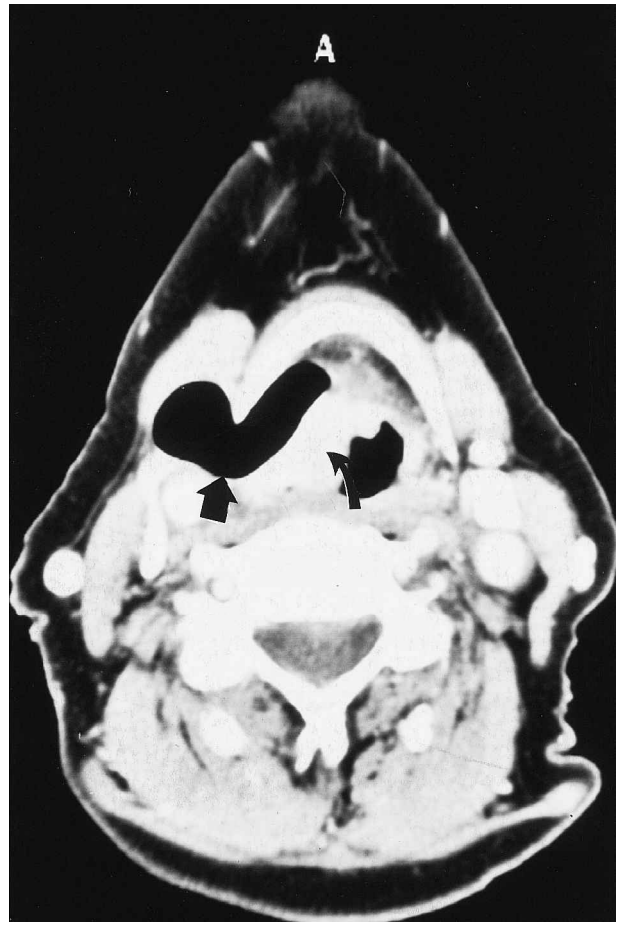

Fig. 1
Axial dynamic CT scan at level of hyoid showing mixed laryngocele with an adjacent thickened right aryepiglottic field.

Discussion

The saccule, or appendix of the laryngeal ventricle, is present in the majority of human larynges. It arises from the anterior end of the ventricle, and extends superiorly in the paralaryngeal space, bounded by the false fold medially and the thyroid cartilage laterally. A laryngocele is an abnormally large saccule, though there is some disagreement over the precise definition of this term. The

From the Departments of Otolaryngology and Radiology*, Beaumont Hospital, Dublin, Ireland.
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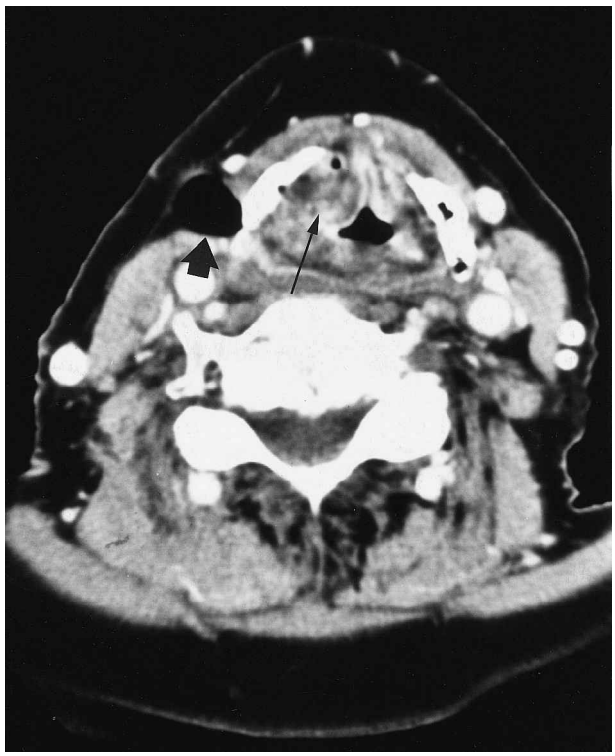

FIG. 2
CT scan showing tumour mass in right ventricle, with proximal end of laryngocele.

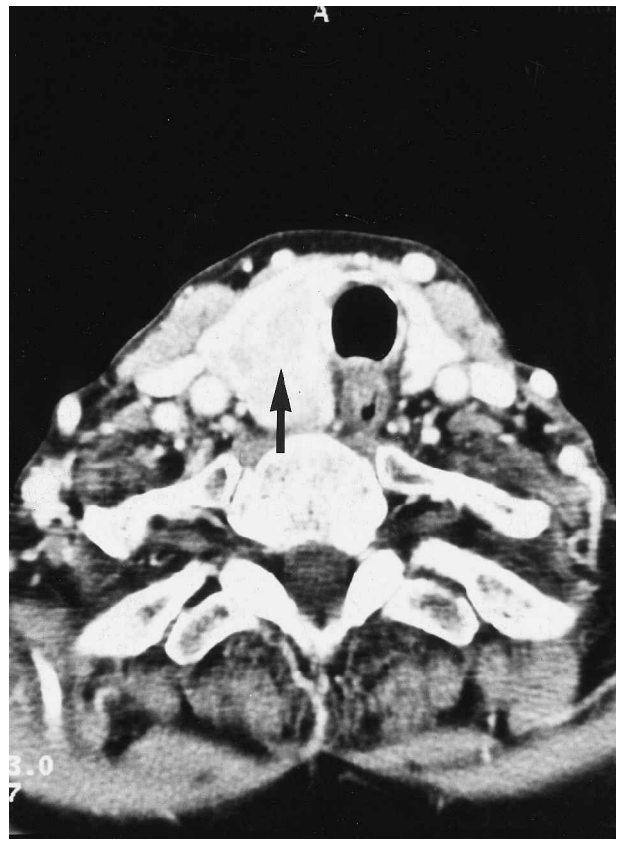

FIG. 3
CT scan showing incidental right thyroid nodule.

most common definition is where the saccule extends above the superior level of the thyroid cartilage.[1–3] Laryngoceles are usually classified as internal, where the saccule is dilated but remains within the confines of the larynx, external where the saccule pierces the thyrohyoid membrane at the site of entry of the superior laryngeal artery and nerve, or mixed, where features of both are present. Laryngoceles are normally air-filled, but may be filled with mucous or pus, to form laryngomucoceles or mucopyoceles, respectively.

Laryngoceles are often asymptomatic, but may present with symptoms of cough, hoarseness, a foreign body sensation or as a cystic swelling anterior to the sternocleidomastoid.[4] However, the focus of much of the published data on laryngoceles, lies with its relationship with laryngeal carcinoma. The coexistence of laryngocele and laryngeal carcinoma was first described by Marschik in 1927. In an extensive review of the literature by Brit,[2] the presence of a laryngocele in patients with laryngeal cancer varied between 0.16 and 18 per cent. These disparate figures can, at least in part, be explained by the various authors' precise definition of laryngocele, as well as the extent to which a laryngocele was searched for. Birt's own study, in which he retrospectively assessed 353 laryngeal specimens, found laryngoceles in 4.9 per cent of patients with laryngeal carcinoma, increasing to 17.8 per cent when a definition used for laryngocele was that in which the saccule exceeded alar cartilage dimension. Micheau *et al.*[5] compared 546 total laryngectomy specimens and 360 pharyngolaryngectomy specimens, among which they found an incidence of laryngoceles of 18 per cent and two per cent respectively, providing strong evidence of the relationship between these saccular dilatations and laryngeal cancer, in particular. Finally, Canalis[6] reviewed 131 patients with symptomatic laryngoceles and found the rate of occult cancer to be four per cent.

The aetiology of this relationship has been debated. Distortion of the saccule neck by carcinoma may create a one-way valve, with subsequent inflation and distension of the saccule. This does not, however, explain the existence of contralateral or bilateral lymphoceles. A second theory is that carcinoma may preferentially arise in the lining epithelium of a large saccule. However, there is little in the way of scientific evidence to support this hypothesis. Another suggestion is that altered laryngeal physiology, in the presence of a carcinoma, may increase intralaryngeal pressure, possibly from frequent coughing, phonatory alterations, or altered laryngeal neuromuscular mechanics, resulting in enlargement of a congenitally large saccule.[2,7]

In conclusion, standardized definitions limit comparison of studies, although Virchow's original definition of a saccule extending above the level of the thyroid cartilage is the most accepted. There does appear to be a relationship between laryngoceles and laryngeal carcinoma, although the mechanism behind this is still unclear. The relationship is sufficient to warrant endoscopy to rule out carcinoma in those patients who initially present to the otolaryngologist with a laryngocele.

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Address for correspondence:
Mr M. Harney,
11 Glendoher Road
Rathfarnham,
Dublin 16,
Ireland.

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