The association of laryngoceles with squamous cell carcinoma of the larynx presenting as a deep neck infection

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Abstract. The association of laryngoceles with squamous cell carcinoma of the larynx presenting as a deep neck infection. Laryngoceles with squamous cell carcinoma. Objectives: We present a case of an external laryngocele with laryngeal carcinoma. Introduction: A laryngocele is a rare benign lesion of the larynx resulting from an abnormal dilation of the laryngeal saccule filled with air. When the neck of the laryngocele is obstructed, it fills with mucus and is called a laryngopyocele.

Results: There may be a relationship between laryngoceles and squamous cell carcinomas of the larynx. A review of the literature found a reported association between laryngoceles and carcinomas of the larynx of between 4.9 and 54%. In this report, we present a case of an external laryngocele associated with laryngeal carcinoma. Another important point of this case is that a deep neck infection was the first symptom.

Conclusion: In the light of the cases presented in the literature, patients with a deep neck infection should undergo CT imaging and patients with laryngoceles must also be examined with direct laryngoscopy.

Introduction

A laryngocele is a rare benign lesion of the larynx resulting from an abnormal dilation of the laryngeal saccule filled with air. Laryngoceles have been classified as internal, external, or combined according to their relationship with the thyrohyoid membrane. An internal laryngocele is medial, an external is lateral, and a combined laryngocele is both medial and lateral to the thyrohyoid membrane. Although their origin is unclear, it is probably related to an increase in intralaryngeal pressure. Clinically, a laryngocele presents as hoarseness, with neck mass, airway obstruction, and even a neoplasm. The relationship between laryngoceles and laryngeal carcinomas is not fully understood. In this report, we present a case of an external laryngocele with laryngeal carcinoma. Another important point of this case is that a deep neck infection was the first symptom.

Case report

A 48-year-old man presented complaining of progressive hoarseness over the past year and swelling of the neck. Physical examination showed a 6-centimetre swelling on the midline from hyoid bone to the left supraclavicular region. This mass was tender, fluctuating and hyperaemic (Figure 1). The rapidly progressive mass was drained surgically and the infected secretion aspirated. The culture was negative. On microlaryngoscopic examination, we observed oedema on the left arytenoids and the left vocal cord was fixed. Intensive treatment with IV antibiotics (sulbactam-ampisillin 4×1 gr, metronidazole 2×500 mg.) was started. However, the deep neck infection progressed rapidly and the skin of the anterior neck area between sternocleidomastoid muscles necrotised and was lost (Figure 1). Contrast-enhanced CT scans confirmed the marked thickening of the false vocal cord and vocal cord, and the extension of the laryngocele through the thyrohyoid membrane of the larynx. There was also a collection extending from the inferior part of left submandibular gland to the supraclavicular region (Figure 2).

The patient underwent direct laryngoscopy under general anaesthesia. The endolarynx was normal. However, when the left false vocal cord was elevated, leukoplakia and ulceration were seen in the ventricle. There was a pouch filled with leukoplakia and extending to the subglottic region. Biopsies were taken from pouch and ventricle. Histopathological examination revealed the microinvasive squamous cell carcinoma. The clinical stage of the tumour...
was T3N0M0. Histology was also obtained from the neck and it was tumour-negative. After antibiotic therapy, the patient was free of mass in the neck examination and the skin of the anterior neck area re-epithelialised without any surgical intervention. The patient was treated with curative radiation therapy for the larynx and neck to prevent tumour spillage (70 cGy). The patient was free of the disease for 6 months.

**Discussion**

The term laryngocele was introduced by Virchow in 1867 to describe the abnormal dilatation of the saccule or ventricle. The incidence of laryngoceles is estimated to be 1 per 2.5 million population per year, and laryngoceles have been reported to be 5 times more frequent in men, with a peak incidence in the sixth decade of life. When the neck of the laryngocele is obstructed, the laryngocele fills with mucus and is known as a laryngopyocele. The pathogenesis of laryngoceles is uncertain. Some feel there is congenital predisposition owing to the embryological development of the saccule. Following a period of rapid growth during the second month of embryogenesis, the rate of growth of the saccule slows progressively in comparison to the rest of the larynx. Another theory suggests that increased intralaryngeal pressure leads to the dilatation or herniation of the saccule. This theory is supported by the prevalence of laryngoceles in patients with certain occupations such as glass blowers and wind instrument players and those with chronic respiratory disease.

There is a relationship between laryngoceles and squamous cell carcinomas of the larynx. The aetiology of the laryngocele with carcinoma is not well understood. Several theories about the coexistence of laryngocele and laryngeal carcinoma have been put forward. The first theory describes the distortion of the saccule neck by a carcinoma, which may create a one-way valve that inflates and distends the saccule. The second theory is that a carcinoma may arise from the lining epithelium of a large saccule. The third theory postulates an alteration of laryngeal physiology due to carcinoma, which may increase intralaryngeal pressure, possibly as a result of frequent coughing, phonatory misuse or changes in laryngeal neuromuscular mechanics, resulting in the enlargement of the congenitally large saccule. When the literature was scrutinised carefully, reports were found of an association between laryngoceles and carcinomas of the supraglottic larynx.
but this is the first case in the literature of a laryngopyocele with laryngeal carcinoma presenting as a deep neck infection. In this case, the laryngopyocele extended through the thyrohyoid membrane and between fascias of the neck, and led to deep neck infection.

The incidence of the combination of a laryngocele with laryngeal carcinoma\textsuperscript{9-13} has been reported at 4.9-54%. Micheau \textit{et al.}\textsuperscript{9} performed detailed pathological examinations on a total laryngectomy and pharyngolaryngectomy specimens resected because of cancer. They reported that laryngoceles were present in about 2% of the 360 pharyngeal cancer specimens and in 18% of 546 laryngectomy specimens. Celin \textit{et al.}\textsuperscript{10} reported an incidence of laryngoceles concurrent with squamous cell carcinoma of the larynx of between 4.9% and 28.8%. Close \textit{et al.}\textsuperscript{11} reported that, of 59 patients with biopsy-proven squamous cell carcinoma of the larynx, 17 (28.8%) had an associated laryngocele, whereas 21 laryngoceles were identified among 245 patients (8.6%) without laryngeal cancer. Lindell \textit{et al.}\textsuperscript{12} observed that 49% of laryngoceles were associated with laryngeal carcinoma. Pietrantoni \textit{et al.}\textsuperscript{13} retrospectively reviewed 857 patients who underwent laryngectomies and had preoperative radiographic examinations. Although the exact diagnostic criteria were not stated, 53 (6%) were found to have laryngoceles.

**Conclusion**

In conclusion we described a deep neck infection and laryngeal carcinoma arising from an external laryngocele. In the light of this case and the literature, patients with deep neck infections should undergo CT imaging and patients with laryngoceles must be examined with direct laryngoscopy.

**References**