

Katya Op de beeck
Robert Hermans
Pierre R. Delaere
Walter Van den Bogaert
Guy Marchal

Laryngeal squamous cell carcinoma presenting as a prelaryngeal neck abscess: report of two cases

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K. Op de beeck · R. Hermans (✉) ·
G. Marchal
Department of Radiology,
University Hospitals, Herestraat 49,
3000 Leuven, Belgium
E-mail: robert.hermans@uz.kuleuven.ac.be
Phone: +32-16-343781
Fax: +32-16-343765

P. R. Delaere
Department of Otorhinolaryngology,
Head and Neck Surgery, University
Hospitals, Herestraat 49, 3000 Leuven,
Belgium

W. Van den Bogaert
Department of Radiation Oncology,
University Hospitals, Herestraat 49,
3000 Leuven, Belgium

Abstract Head and neck tumours presenting as a neck abscess are extremely rare. Two patients with laryngeal squamous cell carcinoma, presenting with a prelaryngeal abscess, are described. Although clinically and on the CT studies these cases were suspect for underlying malignancy, the initial biopsies were negative for cancer. Because of persistent suspicion, repeat biopsies finally confirmed the presence of a squamous cell carcinoma. Pathological examination after total laryngectomy showed cancer localised in one of the true vocal cords, invading the anterior commissure and thyroid cartilage. However, the prelaryngeal soft tissues were free of tumour, showing only inflammatory changes and collections of pus. These cases emphasize the importance of repeat targeted biopsies and follow-up CT-studies in patients with a prelaryn-

geal abscess of obscure aetiology, in order to exclude or confirm a possible underlying malignancy.

Keywords Larynx · Neck neoplasms · Abscess

Introduction

Some cases of squamous cell carcinoma presenting as cervical cellulitis or an abscess in the site of metastatic neck nodes have been described [1]. We report two cases of laryngeal squamous cell carcinoma presenting as a prelaryngeal abscess. To the best of our knowledge, a laryngeal malignancy presenting in this manner has not been described previously.

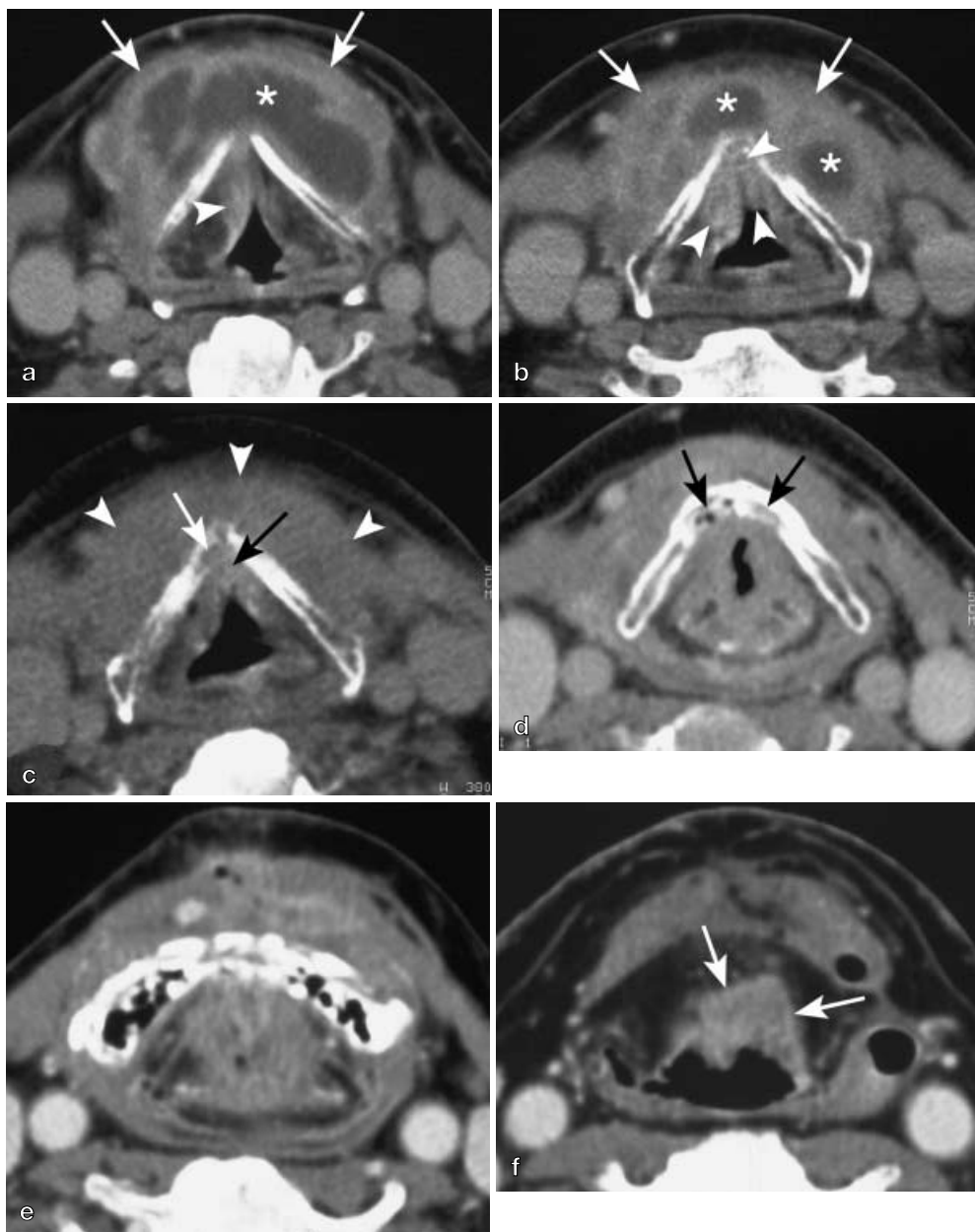
Case reports

Case 1

A 63-year-old man, known with tobacco abuse and complaining of hoarseness of 2-year duration, presented with recently progressive hoarseness, soar throat and dysphagia. Indirect endoscopic examination revealed diffuse laryngeal dysplasia. A mass was palpated in the prelaryngeal soft tissues.

A contrast-enhanced CT study was performed. This showed a large predominantly cystic mass with rim enhancement in the prelaryngeal soft tissues, localised under the strap musculature, suggestive in the first instance of a prelaryngeal abscess. The intralaryngeal soft tissues, especially the region of the anterior com-

Fig. 1 Axial contrast-enhanced CT images at the level of the false vocal cords, **a** 5 mm cranial to **b**. A large fluid collection (asterisks) with rim enhancement is seen in the prelaryngeal soft tissues, displacing the strap muscles (arrows) anteriorly. Enhancing soft tissue thickening in the anterior part of the false vocal cords and at the anterior commissure (arrowheads). The anterior margin of the thyroid cartilage appears slightly irregular, suggesting cartilaginous involvement. **c** Axial contrast-enhanced CT image obtained 2 weeks after **a** and **b**. Persistent prelaryngeal (arrowheads) and intralaryngeal (black arrow) soft tissue thickening. Again, some irregularity of the adjacent inner cortex of the thyroid cartilage is seen (white arrow). **d** Axial contrast-enhanced CT image obtained 2 months after **c**. Thickening of the true vocal cords and anterior commissure. Defects in the inner cortex of the thyroid cartilage (arrows), containing some air bubbles on the right side, progressive compared with **c**. **e, f** Axial contrast-enhanced CT images obtained approximately 10 months after **d**. Important soft tissue thickening at the glottic level (**e**), causing stenosis of the laryngeal airway. Prelaryngeal soft tissue thickening. Fragmentation and collapse of the thyroid cartilage, containing air bubbles. At the supraglottic level (**f**) epiglottic thickening and infiltration of the pre-epiglottic space (arrows) is seen



missure and anterior parts of the false vocal cords, were thickened and showed some enhancement. A laryngeal malignancy could not be excluded (Fig. 1a, b).

Antibiotic therapy was started and 2 weeks later a follow-up CT study was obtained, showing volume reduction of the abscess. The intralaryngeal soft tissue thickening was still present. In the region of the anterior commissure some irregularity of the adjacent inner cortex of the thyroid cartilage was noted. Again, a strong suspicion for underlying malignancy was postulated (Fig. 1).

Direct endoscopic examination at that time showed an ulcerative lesion in the anterior commissure, extending on both the true and false vocal cords. Multiple biopsies were taken. Histology of these biopsies showed acanthosis and hyperkeratosis but no evidence of malignancy. The prelaryngeal mass was explored under

general anaesthesia. A large abscess was found and drained. *Streptococcus pyogenes* was cultured from the pus, and adapted antibiotic therapy was started.

Follow-up CT study, performed 2 months later, showed complete regression of the abscess with some residual inflammatory changes in the prelaryngeal tissues; however, there was a further progression of the intralaryngeal soft tissue thickening, now also extending in the subglottis and epiglottis. Defects in the inner cortex of the thyroid cartilage, containing some air bubbles, were visualised at the glottic level (Fig. 1d). Again, these findings were considered to be suspicious for malignancy, but as the previous biopsies were negative, the possibility of an aggressive inflammation or infection was included in the differential diagnosis. Repeat biopsies could not confirm malignancy.

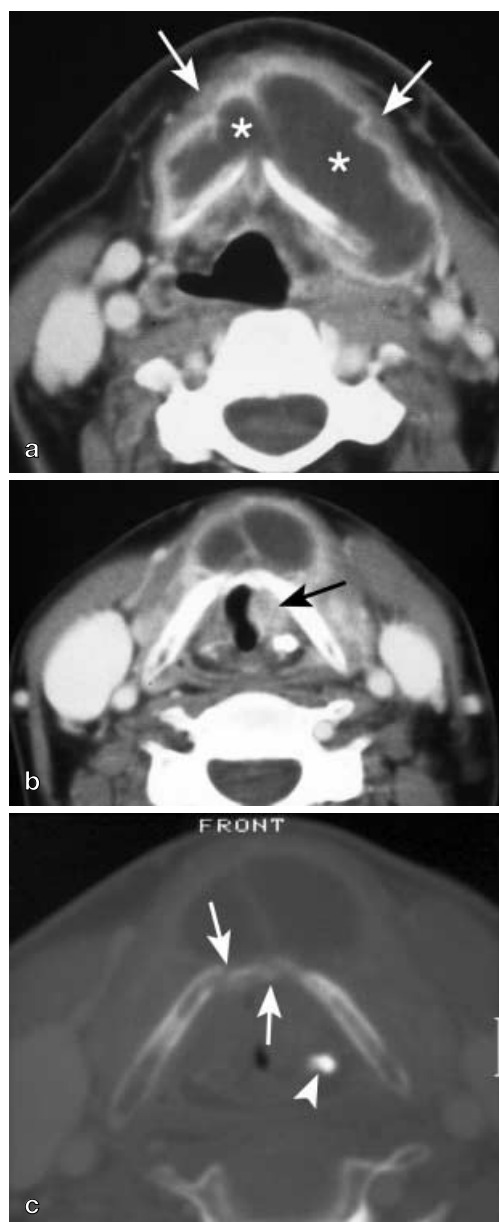


Fig. 2a-c Axial contrast-enhanced CT images. **a** Supraglottic level. Large fluid collection (asterisks) with rim enhancement is seen in the prelaryngeal soft tissues, displacing the strap muscles (arrows) anteriorly. **b** Glottic level. The large fluid collection extends downwards to this level. Thickening and enhancement of the left true vocal cord (arrow). **c** Same level as **b**, bone window. Fragmentation of the anterior part of the thyroid cartilage (arrows). Sclerosis of left arytenoid cartilage (arrowhead)

In the course of several months, the patient presented twice with recurrent prelaryngeal abscesses which were drained and treated with proper antibiotic therapy. Histologically, no malignancy was found. On one of these occasions, *Corynebacterium amycolatum* was cultured from the pus.

A repeated CT study, performed 1 year after initial presentation, demonstrated further progression of the intralaryngeal soft

tissue thickening, with important subglottic and glottic stenosis, and progressive fragmentation and collapse of the thyroid cartilage (Fig. 1e). There was also thickening of the epiglottis and infiltration of the pre-epiglottic fat (Fig. 1f). New biopsies were obtained, now revealing squamous cell carcinoma.

Definitive histological examination, after total laryngectomy, showed a well-differentiated transglottic squamous cell carcinoma with surrounding inflammatory changes. The thyroid cartilage was invaded on both sides. The prelaryngeal soft tissues contained no malignant cells, only pus collections and inflammatory changes.

The patient received postoperative radiotherapy, up to 50 Gy. The patient has been followed up for 2 years after initial presentation, without evidence of recurrent disease.

Case 2

A 59-year-old man, known with tobacco abuse and hoarseness of 2-year duration, presented with a few-days history of progressive soar throat. There was important dysphagia for solid food and to a lesser degree for fluids.

A solid soft tissue mass was palpated, anterior to the thyroid cartilage. Indirect laryngoscopy could not be performed.

A contrast-enhanced CT study of the larynx showed a large, predominantly cystic mass with rim enhancement in the prelaryngeal soft tissues, underneath the strap muscles and extending from the pre-cricoidal region up to the level of the hyoid. These changes were highly suggestive for a prelaryngeal abscess. On one slice the left true cord appeared markedly thickened and enhancing. The left arytenoid cartilage was sclerotic. Focal fragmentation of the adjacent thyroid cartilage was seen (Fig. 2). These findings were considered as suspicious for an underlying malignancy.

Direct endoscopic examination showed granulomatous tissue on the anterior part of both true vocal cords with some pus in-between. Biopsies from the anterior commissure and both true vocal cords showed only acute and chronic inflammatory changes, but no evidence for malignancy.

The prelaryngeal mass was explored under general anaesthesia. A large abscess was found and drained. *Streptococcus pyogenes* was cultured from the pus and antibiotic therapy was started.

Repeated biopsies were taken some weeks later because of persistent suspicious aspect of the laryngeal tissues during clinical follow-up. Histology of these biopsies confirmed squamous cell carcinoma. Total laryngectomy was performed. A moderately differentiated squamous cell carcinoma, located on both the true vocal cords and anterior commissure, extended in both the false vocal cords. Posteriorly, the tumour reached the left arytenoid, which showed minimal neoplastic invasion. There was bilateral invasion of the thyroid cartilage with focal destruction of its external contour. In the prelaryngeal soft tissues only cicatricial and inflammatory changes were detected.

Postoperatively, radiotherapy was administered up to 50 Gy. The patient remained locally controlled but died 4 years later of metastasised lung cancer.

Discussion

The diagnosis of laryngeal squamous cell cancer is usually straightforward, as most cancers arise on the mucosal surfaces which can be evaluated by indirect and direct laryngoscopy. Radiological evaluation, using CT or MRI, is complementary to clinical evaluation, re-

vealing deep tumour extension not visible by endoscopy. A similar accuracy with both techniques in the assessment of tumour extension in the various laryngeal compartments has been reported [2, 3]. Both techniques are also of value in demonstrating nodal spread not evident by palpation. In our two cases no MR studies were performed. Neither CT nor MRI allow differentiation between tumour tissue and surrounding inflammatory tissue [4].

The presentation of a primary head and neck malignancy as cervical cellulitis or a neck abscess is rare. The centre of a large primary malignant lesion may be susceptible to infection because of tumour necrosis resulting from poor vascular supply [1, 5]. There are some reports describing series of patients with metastatic head and neck squamous cell carcinoma presenting as abscesses in the regional adenopathies [1, 6, 7, 8]. A patient who presented with a neck abscess originating in a cluster of metastatic adenopathies originating from a primary oesophageal squamous cell carcinoma was reported [9]. In all these cases a biopsy specimen from the wall of the abscess at the time of the drainage was diagnostic for cancer.

Other malignancies reported to be associated with neck abscesses in involved neck nodes are non-Hodgkin's lymphoma and colon carcinoma [10, 11].

The pathophysiology of abscess formation in a neck adenopathy involved by squamous cell carcinoma is not clear. The invariably infected ulcer of the primary tumour is a likely source of abscess forming bacteria draining into these lymph nodes. The organism most commonly found in such tumour abscesses is *Staphylococcus aureus* [7].

As far as we know, squamous cell carcinoma presenting as a prelaryngeal abscess has not been reported previously. The abscesses were not localised in metastatic adenopathies, and no obvious malignant cells were found in the abscess walls, nor in the prelaryngeal soft tissues. In both cases the primary lesion was a glottic cancer, arising on the true vocal cords and/or anterior commissure, invading the thyroid cartilage. This suggests a possible pathophysiological relation between neoplastic invasion of the thyroid cartilage and development of a prelaryngeal abscess. Histopathological osteomyelitis (defined as necrotic bone or marrow spaces containing acute inflammatory exsudate) or

chondronecrosis (defined as cartilage bathing in purulent exsudate) has been found in approximately 25% of cases with advanced laryngeal cancer (pT3 or pT4), both in irradiated and non-irradiated patients. Such findings usually occur on the side of the tumour [12]. Presumably, in the presented cases the neoplasm, or the combination of the neoplasm and a locally aggressive infection, eroded through the thyroid cartilage, offering the bacteria a pathway to the prelaryngeal soft tissues. Why in these two cases an abscess developed, which was not seen in other cases of laryngeal transcartilagenous tumour extension, is not clear; it may be related to a virulent type of infection and/or reduced host resistance.

The main differential diagnosis in the presented cases is infected thyroglossal duct cyst; however, these cysts are typically embedded within the prelaryngeal strap muscles, and not underneath these muscles [13]. Thyroglossal duct cysts may bulge in the larynx at the level of the thyrohyoid membrane. They are not expected to cause intralaryngeal abnormalities at the level of the anterior commissure or vocal cords. In the reported cases, laryngopycoele was not considered a likely aetiology. Such a lesion is expected to be located within the intralaryngeal paraglottic space, sometimes protruding extralaryngeally through the (lateral) thyrohyoid membrane [14].

Infection coexisting with malignancy complicates the clinical picture and may lead to a delayed diagnosis of malignancy. It is likely that the superposition of infection on a malignant process reduces the chances of obtaining a positive biopsy. Therefore, careful follow-up after the initial treatment should be set up if the aetiology of the infection remains obscure, especially in patients with an increased risk of developing head and neck cancer (alcohol and/or tobacco abusers). Repeat CT (or MRI) are helpful in coming to a correct diagnosis, visualising submucosal lesions and allowing targeting of biopsies in the area most radiologically suspect. In cases of negative or inconclusive biopsy results, but suspect radiological findings, further investigation, including repeat biopsy, should be performed [15, 16].

In the case of an abscess associated with head and neck malignancy, the management involves definitive cancer treatment and appropriate treatment of the abscess.

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