



# A Rare Case of Malignant Laryngeal Squamous Cell Carcinoma Metastasizing to the Adrenal Glands

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## Abstract

The most common malignancy of the larynx is Squamous cell carcinoma, which accounts for more than 90% of laryngeal malignancies. This cancerous growth remains predominantly localized in the larynx, and distant metastasis is rare. A 53-year-old male chronic smoker presented with dyspnea at our department. Imaging revealed a mass on his right vocal fold, which was histopathologically confirmed as T2bN0M0 non keratinizing laryngeal squamous cell carcinoma. The tumor was resected with partial laryngectomy. Eighteen months later, a left adrenal gland tumor was identified as a metastatic lesion originating from the larynx. Subsequent surgical resection was performed while narrow band imaging ruled out tumor recurrence in the larynx.

## Abbreviations

CT: Contrast tomography; MRI: Magnetic Resonance Imaging; NCCN: National Comprehensive Cancer Network; PET: Positron Emission Tomography; PET/CT: Positron Emission Tomography - Computed Tomography

## Introduction

Squamous cell carcinoma is represented by malignant proliferation of the squamous epithelium and can be found in a number of different types of cancers. Although the larynx is host to a wide variety of malignancies, squamous cell carcinoma remains the most common, accounting for 85% to 95% of all laryngeal cancer cases [1]. This type of cancer usually arises in the glottis but can also originate from the supraglottic or rarely the subglottic region. Patients with laryngeal cancer often present with hoarseness, dyspnea, and dysphagia. Primary risk factors include smoking and alcohol consumption, with a proportional increase in risk correlated with their duration of use [2]. Distant metastasis is rare and varies according to the primary location of the tumor. The most frequent pattern of metastasis involves hematogenous spread to the lungs. In this case report, we discuss a case of non keratinizing squamous cell carcinoma originating from the larynx, which had disseminated to the adrenal gland.

## Case Presentation

A 53-year-old male was referred to our otolaryngology department from the emergency room due to a 2-month history of dyspnea and hoarseness. A laryngeal mass was later discovered and identified as the source of the symptoms. In our department, the patient underwent Kleinsasser microsurgery to obtain histopathological samples, in which the results confirmed non keratinizing squamous cell carcinoma. Subsequent contrast-enhanced Computed Tomography (CT) revealed an irregular enlargement of the right vocal fold associated with an increase in intensity of 5 mm (Figure 1). These changes did not extend past the anterior commissure down to the level of the cricoid cartilage. Moreover, invasion of the laryngeal cartilage was not observed. Further investigations with routine chest X-ray and abdominal ultrasound established no changes, staging the tumor as T2bN0M0.

Transoral partial laryngectomy of the glottis was performed using a CO<sub>2</sub> laser. During treatment, the right vocal fold, arytenoid, anterior commissure, vestibule part and a third of the anterior left vocal fold were resected. The subglottic space showed no abnormalities, indicating the absence of infiltration. The tumor was excised using three safety margins; thus, no radiotherapy was necessary.

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**Figure 1:** Axial contrast-enhanced Computed Tomography (CT) image of the neck. A 5mm mass with increased intensity is identified on the right vocal fold in the supraglottic region.

The material obtained from the laryngectomy further confirmed the initial diagnosis with a grade of 2. In routine follow-up imaging and laryngoscopy, no abnormalities were observed.

Eighteen months later, the patient was admitted to the emergency department due to complaints of left renal colic. Diagnostic imaging revealed a heterogeneous mass in the left adrenal gland, which measured 66 mm in diameter at its largest point. The mass demonstrated poor washout characteristics (less than 50%), indicating a possibility of metastasis to rather than originating from the kidney; there was also clear demarcation between the kidney and the mass. Furthermore, there were a few simple cortical cysts and renal sinus cysts present on imaging in the left kidney (Figure 2). After imaging, the tumor was surgically removed.

Initially, the tumor was suspected to have originated from the lungs. Therefore, the patient was referred to the pulmonology department, and a chest CT was conducted. CT exhibited no changes, thus ruling out metastasis from the lungs. Histopathology results confirmed the adrenal gland tumor as having non keratinizing squamous cell carcinoma characteristics. Due to the patient's history of laryngeal cancer, the origin of metastasis was finally deemed to be the larynx.

**Discussion**

The rate of distant metastasis varies according to the site of the primary laryngeal tumors, among which supraglottic cancers are most commonly found to metastasize [1]. Laryngeal squamous cell carcinoma is known to metastasize hematogenously to distant organs while spreading lymphatically to regional lymph nodes [3]. The

tumors predominantly spread to the lungs; however, other organs, such as the liver and the skeletal system, are infrequently involved.

The majority of the discovered adrenal tumors result from metastasis [4]. Lungs, breasts, and kidneys are the most prevalent sites of origin of adrenal tumors. Typically, metastasis to the adrenal glands is often accompanied by an associated metastasis to other organs [5]. Despite the common nature of cancerous cells spreading to the adrenal glands, it is quite rare to observe such patterns of metastasis from laryngeal malignancies.

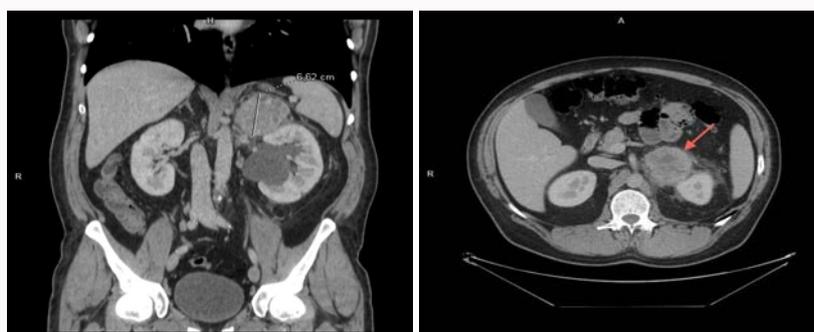
Laryngeal cancers are diagnosed using imaging techniques along with physical examination. The gold standard for imaging is CT or Magnetic Resonance Imaging (MRI), as these provide the most information regarding tumor invasion and other pertinent characteristics. In common practice, confirmation is obtained with additional examinations, such as flexible laryngoscopy and endoscopic examination with biopsy.

Metastases to the adrenal glands are primarily asymptomatic. However, when patients present with symptoms, the tumors are found to be at a more advanced stage. Similar to that for laryngeal cancer, imaging with MRI and CT is used to obtain a diagnosis. PET (Positron Emission Tomography) scans are utilized to discern between benign and malignant tumors [4]. Biopsy is then used to confirm the diagnosis and determine the site of origin.

Transoral laser surgery is generally preferred over open partial laryngectomy in the treatment of early-stage laryngeal tumors, as evidence has shown a relative decrease in morbidity, a shorter recovery time, and an overall better-preserved laryngeal function with the former [6,7]. In late stages, aggressive treatment may be required, starting with routine chemotherapy or radiotherapy. Total laryngectomy is only pursued to eradicate any remaining tumor when all other treatment modalities have failed [8].

Adrenalectomy is performed in patients whose adrenal glands are the only site of metastasis [9]. Radiotherapy is offered to patients who do not qualify for surgical treatment [10]. Chemotherapy is considered when the cancer spreads to other organs beyond the adrenal glands, but this treatment is not curative [11].

The prognosis of laryngeal squamous cell cancer is deemed to be relatively favorable, with a 5-year survival rate of 64% [12]. After surgical resection, follow-up tests are performed to detect any potential cases of recurrence or new lesions since a majority occur within the first few years [9]. Recurrence rates depend not only on the stage of the tumor but also on the location [13]. For instance, tumors originating from the supraglottic region are more prone to recur than tumors in



**Figure 2:** Contrast-enhanced Computed Tomography (CT) scans of the abdomen. **A)** Coronal plane image showing a heterogeneous mass measuring 66 mm in diameter on the left adrenal gland along with a renal sinus cyst. **B)** Axial plane image showing the same heterogeneous mass located on the left adrenal gland.

the subglottis [14]. Currently, there is no definitive consensus among guidelines regarding the surveillance of laryngeal cancers [15]. The National Comprehensive Cancer Network (NCCN) provides a recommended surveillance regimen for clinical examination at different intervals depending on the time after treatment and post treatment baseline imaging within the first 6 months. Cases such as this exemplify the importance of continued surveillance in patients after treatment, especially in patients who continue to smoke and experience risk factors indicated in laryngeal cancer [16,17]. To provide adequate postsurgical care to our patients, we suggest a more comprehensive surveillance regimen for a period of 5 years. Younger patients under the age of 50 should have an abdominal and chest CT performed every 6 months for the first year and once a year in the following years. PET/CT is also recommended to rule out distant metastasis if the patient presents with symptoms. Furthermore, the patient should undergo routine endoscopic procedures every month for the first year, every 3 months in the following year, and then every 6 months in the remaining 3 years. If local recurrence is suspected, narrow band imaging should be performed. With this intensive postsurgical management, we can detect and minimize the likelihood of unusual or aggressive pathologies as a result of the primary tumor, especially in patients with significant risk factors.

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