

HOARSENESS AS A WINDOW INTO THE COMPLEXITY OF SUPRAGLOTTIC CARCINOMA: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

Laryngeal carcinoma ranks among the most prevalent malignancies affecting the head and neck, with supraglottic carcinoma emerging as the predominant subtype, particularly in certain developing regions characterized by prevalent risk factors such as alcohol consumption and smoking. Hoarseness, characterized by a change in the voice, constitutes approximately 1% of all primary care consultations. The predominant etiologies include acute and chronic laryngitis, responsible for 42.1% and 9.7% of cases, respectively, followed by functional dysphonia, benign and malignant tumors, neurogenic factors, and the natural aging process. A 65-year-old male, with a history of active smoking, was referred from a primary healthcare center due to complaints of throat pain and worsening hoarseness that had persisted for one year. The significant airway obstruction observed in this patient underscores the importance of discussing available management options in such cases. It is crucial for primary care physicians to recognize the clinical signs presented by the patient promptly in order to initiate the appropriate management without delay. Regrettably, tend to seek medical attention at an advanced stage of the disease, resulting in a notably unfavorable overall survival rate.

Keyword: Laryngeal Carcinoma, Supraglottic Carcinoma, Hoarseness, Survival Rate

INTRODUCTION

Laryngeal carcinoma ranks among the most prevalent malignancies affecting the head and neck, with supraglottic carcinoma emerging as the predominant subtype, particularly in certain developing regions characterized by prevalent risk factors such as alcohol consumption and smoking. Patients afflicted with supraglottic carcinoma typically manifest throat discomfort, dysphagia, and neck lymphadenopathy, as primary

clinical features. (Ambrosch et al., 2018; van Dijk et al., 2014) Regrettably, these individuals tend to seek medical attention at an advanced stage of the disease, resulting in a notably unfavorable overall survival rate. The anatomical scope of the supraglottic laryngeal region encompasses vital structures like the epiglottis, ventricular bands, aryepiglottic fold (in its laryngeal aspect), and the laryngeal ventricle, each serving distinctive

anatomical functions. To date, it remains an open question whether disparities exist in clinical features and prognosis contingent upon the specific subregion of carcinoma involvement. (Petrakos et al., 2012; Silvestri et al., 1992)

Hoarseness, characterized by a change in the voice, constitutes approximately 1% of all primary care consultations. The predominant etiologies include acute and chronic laryngitis, responsible for 42.1% and 9.7% of cases, respectively, followed by functional dysphonia, benign and malignant tumors, neurogenic factors, and the natural aging process. Notably, any patient presenting with persistent or progressive hoarseness persisting for more than two weeks and possessing risk factors should trigger immediate investigation and referral to a secondary or tertiary healthcare facility to rule out the possibility of laryngeal cancer. (Divakar & Davies, 2023; Mourad et al., 2017) Despite laryngeal cancer often manifesting with an early and prominent symptom such as hoarseness, delays in referral to an otolaryngologist remain a common issue, as illustrated in our case.

LITERATURE REVIEW

Laryngeal malignancies constitute a substantial proportion of the total head and neck cancer cases, amounting to approximately one-third, and they carry a significant burden of disease-related morbidity and mortality. They are most frequently identified in individuals with a substantial history of tobacco consumption, which also elevates their susceptibility to other aerodigestive tract cancers. Laryngeal cancers can manifest in various subsites within the larynx, each manifesting distinct clinical presentations, patterns of

metastasis, and treatment strategies. Early-stage cases typically exhibit a high likelihood of curability through singular therapeutic modalities, such as surgery or radiation therapy, with an emphasis on preserving laryngeal function. Conversely, advanced-stage disease results in poorer prognoses, necessitates a multidisciplinary treatment approach, and is less amenable to laryngeal preservation. Notably, patients requiring laryngectomy now have access to enhanced speech rehabilitation techniques in contemporary medical practice. (Divakar & Davies, 2023; Mourad et al., 2017)

Annually, an estimated 13,000 cases of laryngeal cancer are diagnosed in the United States, predominantly comprising squamous cell carcinomas. While the historical approach to treating laryngeal cancer predominantly relied on surgical intervention, contemporary management strategies prioritize organ preservation through chemoradiation therapy, which has been supported by numerous studies demonstrating comparable outcomes to total laryngectomy. Furthermore, modern medical practice also incorporates endoscopic techniques for managing laryngeal cancer. (Petrakos et al., 2012; Ruytenberg et al., 2018)

Case Presentation

A 65-year-old male, with a history of active smoking, was referred from a primary healthcare center due to complaints of throat pain and worsening hoarseness that had persisted for one year. Prior to his referral, he had sought medical attention at primary care clinics, where he received two courses of antibiotics over a span of two months. Subsequently, he was referred to a secondary healthcare

facility, where an otorhinolaryngology consultation was sought. Notably, he also reported experiencing dysphonia during the month leading up to his referral.

Endoscopic evaluation of the larynx conducted at the secondary healthcare facility revealed vocal fold immobility and the presence of an irregular mass in the supraglottic region (Figure 1). Despite these concerning findings, the patient exhibited stable vital signs, with a respiratory rate of 20 breaths per minute and an initial room air oxygen saturation level of 98%. Notably, no palpable neck masses or lymphadenopathy were detected during the physical examination. In response to the airway obstruction and edema, the patient received

dexamethasone for management and prevention of further complications. The patient will promptly undergo a scheduled biopsy procedure aimed at ascertaining the specific nature of the supraglottic cancer. The result of biopsy information will enable the implementation of an appropriate therapeutic regimen until definitive surgical intervention can be carried out for the cancer.

The significant airway obstruction observed in this patient underscores the importance of discussing available management options in such cases. It is crucial for primary care physicians to recognize the clinical signs presented by the patient promptly in order to initiate the appropriate management without delay.



Figure 1. Irregular mass located in the supraglottic region.

DISCUSSION

Laryngeal cancers constitute approximately one-third of all head and neck cancers and can impose substantial morbidity and mortality. They are frequently diagnosed in individuals with a significant history of tobacco smoking. Laryngeal cancers can manifest at various sites within the larynx, and the specific site of involvement has a notable impact on the clinical presentation, patterns of metastasis, and available treatment modalities. In cases of early-stage disease, successful

outcomes are often attainable through surgical intervention or radiation therapy as standalone treatments, with a strong emphasis on larynx preservation. Conversely, late-stage disease carries a less favorable prognosis, necessitating multimodal therapy approaches and presenting challenges in preserving laryngeal function.(Mourad et al., 2017; Petrakos et al., 2012)

The current statistics regarding the incidence, prevalence, and mortality of laryngeal cancer are

as follows: there are an estimated 2.76 new cases per year per 100,000 inhabitants, a prevalence rate of 14.33 cases per 100,000 inhabitants, and an annual mortality rate of 1.66 deaths per 100,000 inhabitants. Collectively, this results in an average of 3.28 million Disability-Adjusted Life Years (DALYs) attributed to laryngeal cancer each year. Over the past three decades, there has been a 12% increase in incidence and a 24% increase in prevalence, while mortality has declined by approximately 5%. (Brandstorp-Boesen et al., 2014)

The epidemiological burden of this malignancy exhibits a significant gender disparity, with males experiencing a five-fold higher incidence compared to females. Additionally, the risk of laryngeal cancer rises with advancing age, peaking after the age of 65. Geographically, both incidence and mortality rates are higher in Europe and lower in Africa, but the ratio of deaths to incidence is most pronounced in Africa. Notably, while Europe has witnessed a gradual decline in incidence over the past three decades, South-East Asia and the Western Pacific have observed an increase. The primary risk factors for laryngeal cancer are cigarette smoking and alcohol abuse, which collectively contribute to approximately 90% of the overall worldwide mortality associated with this disease. (Bhattacharyya et al., 2015; Petrakos et al., 2012)

A well-established association exists between smoking, excessive alcohol consumption, and the development of squamous cell cancers within the upper aerodigestive tract. In the case of individuals who smoke, the risk of laryngeal cancer decreases following smoking cessation, although it remains elevated even years later when compared to nonsmokers. For

patients who have experienced a single cancer episode, if they continue to engage in both smoking and heavy alcohol consumption, the likelihood of achieving a cure through any treatment modality diminishes, and the risk of developing a second tumor increases. It is noteworthy that due to clinical complications arising from smoking and alcohol use in this patient population, many individuals succumb to intercurrent illnesses rather than succumbing directly to the primary cancer. Supraglottic cancers typically manifest with symptoms such as a sore throat, painful swallowing, referred ear pain, changes in voice quality, or the presence of enlarged neck lymph nodes. In contrast, early-stage vocal cord cancers are typically identified due to the occurrence of hoarseness. However, when these cancers are detected, they often involve the vocal cords, leading to symptoms that are primarily related to contiguous spread. (Forastiere et al., 2018; Hanna et al., 2019)

Laryngeal cancers can be anatomically categorized into glottic, supraglottic, and subglottic cancers, with the most common sites being the supraglottis and glottis. The distribution of carcinomas in these sites varies among different countries. (Ferlay et al., 2019; Ruytenberg et al., 2018) Notably, the incidence rates of laryngeal cancer are notably high in Spain, France, and northern Italy. In Latin European countries, supraglottic squamous cell carcinomas predominate, whereas in the United States and England, glottic carcinomas are the most frequently observed laryngeal tumors, accounting for 60-70% of cases, while approximately 35% originate from the supraglottic site. (Bhattacharyya et al., 2015; Divakar & Davies, 2023)

It has consistently been demonstrated that supraglottic cancers tend to have a less favorable prognosis compared to glottic cancers. For instance, a 3-year adjusted survival rate of 46% for supraglottic carcinoma patients compared to 83% for glottic carcinoma patients. (Petrakos et al., 2012; Takenaka et al., 2022) This discrepancy in survival rates can be attributed to several factors. Firstly, glottic tumors are often diagnosed at an earlier stage as hoarseness, a cardinal symptom of glottic carcinoma, is more likely to manifest with smaller lesions of the vocal folds. In our own cohort, 62.4% of glottic tumors were diagnosed at stage I, whereas this was the case for no more than 18.6% of supraglottic cancers. Secondly, supraglottic cancers are more frequently associated with nodal involvement at the time of diagnosis, which is attributed to the richer lymphatic supply of the supraglottic area. (Aaltonen et al., 2014; Cosetti et al., 2008)

The supraglottic region is known for its extensive lymphatic drainage. Following penetration of the pre-epiglottic space and the thyrohyoid membrane, the initial lymphatic drainage occurs towards the jugulodigastric and midjugular lymph nodes. Approximately 25% to 50% of patients with supraglottic cancers present with affected lymph nodes, with the exact percentage being contingent upon the T (tumor) stage of the disease. (Jumaily et al., 2019; Mourad et al., 2017) Notably, the true vocal cords lack lymphatics. Consequently, cancer confined solely to the true vocal cords very rarely, if ever, results in the involvement of lymph nodes. However, extension of the tumor above or below the vocal cords may lead to lymph node involvement. Primary subglottic cancers, though

relatively rare, follow a distinct pattern of lymphatic drainage. They drain through the cricothyroid and cricotracheal membranes towards the pretracheal, paratracheal, and inferior jugular lymph nodes, and on occasion, they may extend to mediastinal nodes. (Hannu Raitiola, Juhani Pukander, 1999; van der Woerd et al., 2018)

The prognosis for individuals diagnosed with small laryngeal cancers that have not extended to regional lymph nodes is undeniably promising, with cure rates typically ranging from 75% to 95%. (Forastiere et al., 2018; Hay et al., 2019) The ultimate prognostic outcome hinges on a constellation of factors, including the specific site of the tumor, its size, and the extent of infiltration. In many instances, patients harboring early-stage lesions can achieve a curative outcome through the application of either radiation therapy or surgery. However, in certain cases, radiation therapy may emerge as a reasonable therapeutic choice, particularly when the primary objective is to preserve the patient's vocal function. This approach reserves surgical intervention for potential salvage scenarios. (Patel et al., 2018; van der Woerd et al., 2018) In scenarios featuring locally advanced laryngeal cancers, the standard of care often entails a combination of treatment modalities, such as radiation therapy and chemotherapy, occasionally accompanied by surgery. The primary aim in these cases frequently revolves around the preservation of the larynx in appropriately selected candidates. However, it is essential to recognize that even when the primary tumor is effectively controlled, the occurrence of distant metastases remains a possibility. (Rosenthal et al., 2015; van Dijk et al., 2014)

Intermediate lesions occupy a clinical middle ground with correspondingly intermediate prognoses, influenced by a multitude of factors encompassing tumor site, T (tumor) stage, N (regional lymph node) stage, and the patient's performance status. Consequently, therapy recommendations for patients presenting with intermediate lesions necessitate a comprehensive evaluation that takes into account the intricate interplay of anatomical, clinical, and social variables. This assessment should be conducted through multidisciplinary consultation, involving specialists in surgery, radiation therapy, and dental and oral surgery. (Beitler et al., 2014; Budach et al., 2016)

CONCLUSION

Laryngeal cancers represent a complex spectrum of diseases with varying presentations and prognoses. Early-stage tumors, when detected and treated promptly, offer a favorable outlook for cure, with cure rates ranging from 75% to 95%. The choice between radiation therapy and surgery as the primary treatment modality depends on multiple factors, including the preservation of vocal function. Patients with advanced disease often require a multidisciplinary approach that combines radiation therapy, chemotherapy, and potentially surgery, all with the goal of laryngeal preservation in suitable candidates. The choice of therapy must consider a complex interplay of clinical, anatomical, and social factors. Multidisciplinary consultation involving specialists from various fields is crucial in tailoring the most appropriate treatment strategy for each individual patient. As in our case, clinical symptoms were evident; however, delayed diagnosis

has led to a deterioration in the patient's current health status.

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