Lesions of the Posterior Glottis: Clinical and Pathologic Considerations and Treatment Outcome

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Summary: Objective. To assess the clinical profile, presentation, prognosis, and response to treatment of patients with posterior glottic lesions and the prevalence of malignancy in this group.

Study Design. Retrospective cohort.

Methods. Studying medical records, videostroboscopic examinations, and pathologic reports of patients diagnosed and treated between 2008 and 2011.

Results. Forty-six patients had lesions limited to the posterior glottis. Forty-one of the cases were diagnosed clinically or pathologically as inflammatory granulation tissue; three were cysts; one carcinoma *in situ*; and one invasive squamous cell carcinoma. Of the inflammatory granulation patients, 71% had lesions defined as spontaneous and 29% were considered iatrogenic. Reflux symptoms and reflux signs, as well as psychological stress were significantly more prevalent in the spontaneous group. Fifty percent of the patients with spontaneous lesions had psychological stress, compared with 8% in the iatrogenic group (P value = 0.009). Smoking was a significant risk factor in the iatrogenic group (54% vs 21% P value = 0.03). Nine percent of the lesions were treated with primary surgery. Ninety-one percent were treated with primary conservative management, of whom 31% were eventually referred to surgery. Overall, 91% of the patients were treated successfully. All cases of iatrogenic lesions responded to conservative management or a single surgical intervention. All patients that required multiple interventions were spontaneous.

Conclusions. The results of this study suggest that only a small percent of posterior glottic lesions are malignant, thus the decision about biopsy should be based on clinical judgment. Also, spontaneous granulomas are more refractory to treatment, which can be explained by the repetitive exposure to the etiologic factors.

Key Words: Posterior glottis–Vocal process–Laryngeal contact ulcer–Vocal process granuloma–Laryngeal carcinoma–Laryngopharyngeal reflux.

INTRODUCTION

Glottic lesions most commonly arise from the anterior membranous two-thirds of the vocal folds. Because only this portion participates in vibration, anterior lesions are commonly associated with vocal overuse, abuse, and misuse.[1] This may result in remodeling and the formation of vocal fold nodules, polyps, and cysts.[1] Posterior glottic lesions, however, are less frequent and share distinct clinical and pathologic characteristics.

The posterior third of the glottis comprised the cartilaginous portion of the vocal folds, along with the posterior commissure. It is unique both anatomically and functionally. Anatomically, the posterior glottis is adjacent to the upper esophageal sphincter and houses muscular tissue on the posterior commissure, the cartilage and perichondrium of the arytenoids on each side, and the cricoid lamina. Functionally, the posterior glottis is responsible for 50–65% of the entire adult airway.[2]

These special features of the posterior glottis result in the formation of specific lesions. The most common lesion seen in the posterior glottis is inflammatory vocal process granulation tissue, most often referred to as "granuloma." For convenience, we will use the term granuloma in the following sections, although histopathologically, this is not an accurate definition, as will be discussed in detail, later. In general, these granulomas are divided by their etiology into two subtypes: spontaneous granulomas also known as contact granulomas and iatrogenic or intubation granulomas.

Posterior glottis granulomas may appear as epithelial and cartilaginous ulcerations or may take the form of a nodular or exophytic masses. Although macroscopic appearance of these lesions may be suspected for malignancy, their histology is benign. Vocal process granulomas may be resistant to treatment and recur, yet they do not harbor an invasive potential. Other lesion types, benign or malignant, of the posterior glottis, are relatively infrequent and primary carcinoma only rarely develops in the posterior glottis. When carcinoma is recognized in the posterior glottis, it is more often an extension of an anterior glottic lesion.[3]

The objectives of this study were to map the baseline clinical profile, risk factors, clinical presentation, prognosis, and response to treatment of patients with posterior glottic lesions, and specifically outline the differences between subgroup of patients with vocal process granulomas. The gross appearance and histologic features of these lesions were described, and the prevalence of malignancy was assessed.

MATERIALS AND METHODS

A retrospective study on patients diagnosed and treated in our institution between 2008 and 2011 was conducted. Patients with lesions limited to the posterior glottis were included. Cases that also involved the membranous portion of the vocal fold or extended outside the glottis were excluded.

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We reviewed the patients' medical reports and videostroboscopic examinations to describe demographics, risk factors, clinical presentation, morphology, general course, and prognosis. In cases of surgical intervention, we also reviewed the surgical and pathologic reports.

We assessed the prevalence of several risk factors by questionnaires and history taken by the physician. Among those factors are intubation-history, vocal overuse, and psychological stress. The patients were asked for their profession and to grade their voice use at work and in general. All patients with more than moderate vocal use, occupational, or nonoccupational were categorized with a risk factor of vocal overuse. Psychological stress was reported positive in patients who gave a positive answer to at least one question regarding stress in several fields in life, at work, at home, or in general.

Relevant symptoms included hoarseness, phlegm, foreign body sensation, coughing, dyspnea, and throat pain.

The macroscopic morphologic description of the granuloma was based on videostroboscopic images, as well as the presence of another glottic pathology or reflux-related signs. Reflux signs were defined in patients who met the criteria described by the reflux findings score of Belafsky[4,5]: pseudosulcus, ventricular obliteration, and vocal fold or diffuse laryngeal edema. Special attention was given to the findings of erythema or hyperemia, posterior commissure hypertrophy, and thick endolaryngeal mucus.

We divided the cases of vocal process granuloma into two groups by their etiology, either iatrogenic or spontaneous. Comparing these two groups, the statistical analysis included chi-square test and likelihood ratio to validate the association between categorical variables. We considered significant values as P value <0.05.

Finally, we defined the treatment outcome as failure or success. Success was defined as disappearance of the original posterior glottic lesion during the follow-up period. Failure was defined as recurrence or persistence of the lesion during the follow-up period.

RESULTS

Forty-six patients met the inclusion criteria, all diagnosed with lesions limited to the posterior glottis and treated in our institute between April 1, 2008 and September 30, 2011. The mean follow-up period of this cohort, from first to last clinical visit, was 464 days (15.5 months). The median follow-up period was 452 days with interquartile range of 98–746 days.

The lesions were classified into three groups by their clinical or histologic diagnosis. The great majority, 41 lesions (89%) were granulomas, three (7%) were cysts, and two which account for 4% were diagnosed histologically as squamous cell carcinomas. These groups are further described by their specific location in Table 1. All cysts and carcinoma were surgically removed and the diagnosis was confirmed by pathology. The diagnosis of granuloma was based on pathology in 12 cases and on clinical behavior in 29.

The two malignant lesions are shown in Figure 1; both patients were females. The first patient had invasive squamous cell carcinoma presented with hoarseness with no known risk factors for malignancy. She underwent biopsy due to suspicion of malignancy; the appearance was atypical of granuloma. The malignant lesion was the only pathology in her larynx. The second patient had carcinoma *in situ*, was a heavy smoker, and presented with hoarseness and dyspnea. Aside from the vocal process lesion, she had significant polypoid degeneration (ie, Reinke space edema) of the membranous vocal folds that explained her dyspnea. She underwent surgery to improve her airway and preclude malignancy. Both patients had no classic reflux-related symptoms as throat clearing or heartburn and showed no reflux signs on examination.

The vast majority of the lesions in our study, accounting for 41 cases, were granulomas. Thirty-one (76%) of them were males and 10 (24%) were females. The mean age was 52 years. Thirty-six (88%) of the granuloma patients had unilateral lesion involving the vocal process and four (10%) had bilateral vocal process granulomas. The remaining single patient had a granuloma located on the midline of the posterior commissure (Table 2).

We further divided the granuloma cases into two subgroups by their etiology. Twenty-eight cases (69%) were defined as spontaneous and 13 cases (31%) were iatrogenic. Ten of the iatrogenic granulomas followed endotracheal intubation and three cases were related to laryngeal surgery. There were no statistically significant differences between the two subgroups regarding their demographic characteristics or lesion location as demonstrated in Table 2.

The prevalence of different risk factors is further described in Table 3. Other than intubation history that was positive in 51%, the most common risk factors were vocal overuse (41%) and psychological stress (37%). The most common symptom reported by the patients was hoarseness (68%), followed by phlegm (34%), and foreign body sensation (27%). Other

TABLE 1.
The Lesions by Diagnosis and Specific Location

		Location		
Lesion Type	N (%)	Midline/Posterior Commissure	Bilateral Vocal Process	Unilateral Vocal Process
Total, N (%)	46 (100)	2 (4)	4 (9)	40 (87)
Granulomas, n (%)	41 (89)	1 (2)	4 (10)	36 (88)
Cysts, n (%)	3 (7)	1 (33)	0 (0)	2 (67)
Carcinoma, n (%)	2 (4)	0 (0)	0 (0)	2 (100)