Laryngeal Schwannoma: A Case Presentation and Review of the Mayo Clinic Experience

Jonathan J. Romak, H. Bryan Neel III, and Dale C. Ekbom, *Rochester, Minnesota*

Summary: Objectives. The aim of this study was to clarify the nature of laryngeal schwannomas through review of the experience of a single institution during a 104-year period.

Study Design. This is a retrospective case series.

Methods. The Mayo Clinic, Rochester, Minnesota clinical and surgical pathology database was reviewed for the years 1985–2011. Four cases of laryngeal schwannoma were identified. These cases were pooled with a previously published series of laryngeal schwannomas treated at our institution between 1907 and 1986. The characteristics of all 11 cases were studied, and relevant literature was reviewed.

Results. A total of 11 cases of schwannoma of the larynx were identified. The mean age at presentation was 48 years (range 12–73 years). The most common presenting symptoms were dysphonia and dysphagia. The most frequently involved primary site was the false vocal fold (six patients), followed by the aryepiglottic fold (three), epiglottis (two), subglottis (two), ventricle (one), true vocal fold (one) and postcricoid region (one). The mean maximal tumor diameter was 2.5 cm. In all but one case, surgical excision was curative with no recurrence during recorded follow up ranging from 1 to 17 years.

Conclusions. Laryngeal schwannomas, although rare, should be considered in the differential diagnosis of laryngeal tumors. They occur most frequently in the false vocal fold and present most commonly with dysphonia and/or dysphagia. Surgical excision is the treatment of choice.

Key Words: Larynx–Schwannoma–Neurilemmoma–Neurinoma–Laryngeal.

INTRODUCTION

Schwannomas, also known as neurilemmomas or neurinomas, are benign peripheral nerve sheath tumors arising from the Schwann cells. Schwann cells are neural crest-derived support cells and are responsible for peripheral nerve myelination.[1] Schwannomas become symptomatic due to mass effect on the nerve of origin and adjacent structures. They tend to be well circumscribed, encapsulated masses that are attached to the involved nerve but in most cases can be separated surgically. Grossly, schwannomas appear as gray masses, with variable xanthomatous or cystic changes. Microscopically, two distinct growth patterns (Antoni A and Antoni B) are observed, and S-100 staining is positive. In both growth patterns, individual cells are elongated and have oval nuclei (Figure 1A). In Antoni A, cells are arranged in a compact, parallel ("palisading") pattern. In Antoni B, the tumor is less cellular, less organized, and contains microcysts and lipid laden histiocytes.[1]

Approximately 25–45% of all schwannomas occur in the head and neck, and the majority are found in the parapharyngeal space.[2] Schwannomas originating within the larynx are rare and are thought to arise from the internal branch of the superior laryngeal nerve.[3] Schwannoma and neurofibroma together represent 0.1–1.5% of all benign laryngeal tumors, with schwannomas being slightly more common.[2,4] Schwannomas usually present in the fourth or fifth decade of life and are more common in women.[5] Schwannomas are not known to be associated with any habitual or lifestyle factors; prior radiation exposure and genetic predisposition are the only known risks. Schwannomas may be found incidentally as asymptomatic masses but are more frequently associated with stridor, hoarseness, globus sensation, dysphagia, odynophagia, and/or dyspnea.[6] Complete surgical excision is the treatment of choice.

Schwannomas of the larynx are rare, and the relevant literature is dominated by individual case reports. This paper presents what we believe to be the largest case series of laryngeal schwannomas, consisting of 11 cases at a single institution during a 104-year period, 4 of which are reported herein for the first time. It is helpful for otolaryngologists to understand the clinical behavior, treatment, and outcomes of patients with this neoplasm.

MATERIALS AND METHODS

The approval for this study was granted by the Office of Human Research Protection, Mayo Clinic, Rochester MN (IRB 10—008804). Our clinical and surgical pathology database was queried for cases of schwannoma of the larynx from 1985 to 2011. Tumors involving paralaryngeal structures or involving the larynx by contiguous extension were excluded. Four new cases were identified. These data were pooled with data compiled previously and published by Stanley et al within a review of all

Accepted for publication December 2, 2015.

Author Contributions: JJR reviewed clinic records from 1985 to 2011 and composed the initial manuscript. DCE designed, advised, and guided the project. HBN was the senior author of the 1987 Mayo Clinic publication reviewing laryngeal schwannoma cases from 1907–1986. All authors revised, approved, and completed the final manuscript.

Presented in part as a poster at the Combined Otolaryngology Spring Meeting, April 10–14, 2013, Orlando, Florida.

Conflict of Interest: None.

Financial Disclosure: (i) All financial and material support for this research and work came from the department directly. (ii) There are no financial interests for any of the authors in companies or other entities that have an interest in the information in this article. None of the authors have any financial disclosures.

From the Department of Otorhinolaryngology—Head and Neck Surgery, Mayo Clinic, Rochester, Minnesota.

Address correspondence and reprint requests to Dale C. Ekbom, Department of Otorhinolaryngology—Head and Neck Surgery, Mayo Clinic, 200 First St SW, Rochester, MN 55905. E-mail: Ekbom.Dale@mayo.edu

Journal of Voice, Vol. 31, No. 1, pp. 129.e15–129.e18

0892-1997

http://dx.doi.org/10.1016/j.jvoice.2015.12.003

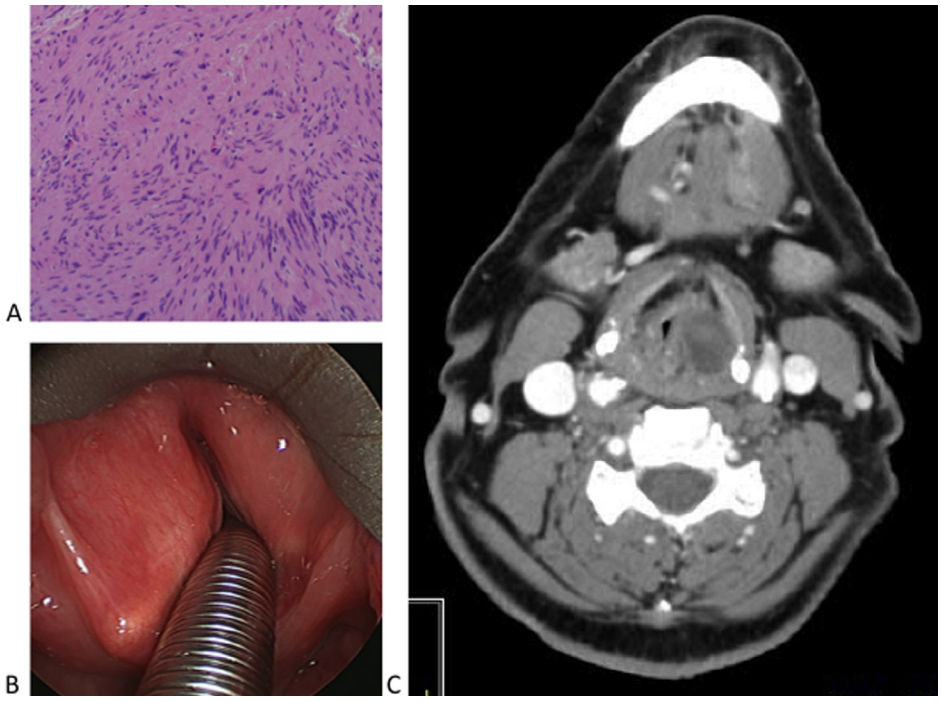

FIGURE 1. **A**. Hematoxylin and eosin stain of the pathologic specimen showing histologic characteristics consistent with schwannoma. **B**. Endoscopic view of left supraglottic schwannoma. **C**. Axial computed tomography (CT) scan showing left supraglottic schwannoma.

laryngeal tumors of neural or neuroendocrine origin at our institution during the years 1907–1986.[7] Their series included seven cases of laryngeal schwannoma. Data regarding patient demographics, tumor characteristics, and outcomes were compiled and analyzed for all 11 patients.

CASE PRESENTATION

For illustration, we have included details of our most recent case. A 65-year-old woman presented with a 6-month history of dysphagia and dysphonia. She reported a history of a "benign" laryngeal lesion removed at an outside facility 6 months earlier. Laryngoscopy revealed a large, smooth left supraglottic submucosal mass (Figure 1B). Computed tomography scan was reported as consistent with an internal saccular cyst (Figure 1C). Transoral CO_2 laser excision was performed, and surgical pathology confirmed schwannoma (Figure 1A). Due to postoperative dysphonia, endoscopic true vocal fold injection augmentation with Cymetra micronized AlloDerm tissue (LifeCell, Bridgewater, NJ) was performed with good result. The patient has been followed for 3 years with no evidence of recurrence.

CASE SERIES

A query of our records from 1985 to 2011 yielded four cases of laryngeal schwannoma.

Stanley et al previously identified seven cases of laryngeal schwannoma at the same institution for the years 1907–1986. Therefore, a total of 11 cases of schwannoma of the larynx were treated at Mayo Clinic, Rochester, during a 104-year period (Table 1). The mean age at presentation was 48, with a range from 12 to 73 years. Eight patients (73%) were female, seven patients (64%) had dysphonia at presentation, and 3 patients (27%) had dysphagia. Two patients had globus sensation and/or "asthma" and two had no symptoms at all. One patient presented with dyspnea, one with stridor and one presented with odynophagia. Seven of nine symptomatic patients presented with multiple symptoms; two presented with isolated dysphonia.

Six patients (55%) had tumors involving the false vocal fold. Three patients (27%) had tumors involving the aryepiglottic fold. Two patients had tumors involving the epiglottis, and another two had tumors involving the subglottis. One patient had a tumor involving the postcricoid region, one in the ventricle, and one in the true vocal fold. Three patients had tumors involving more than one subsite, and one patient had two distinct tumors. All patients underwent surgical excision, with procedures ranging from simple transoral excisional biopsy to cricotracheal resection. Four patients received no documented follow up (it is not uncommon for patients to travel to Mayo Clinic for care and to be followed locally after surgery). One patient had evidence of persistent tumor during 4 years of follow up. 6 patients were followed for between 1 and 17 years, none of whom had evidence of recurrent tumor. Tumor dimensions were available for all but one patient. The mean tumor size in greatest diameter was 2.5 cm with a range from 1 cm to 4.5 cm.

DISCUSSION

Schwannoma of the larynx is an extremely rare entity, and the current literature on the subject consists primarily of individual case reports. To our knowledge, this report presents the largest cohort of patients with laryngeal schwannomas to date. Compiling reported cases from the literature does not necessarily represent the true characteristics of the population at large because