Internal laryngopyocele presenting as acute airway obstruction

Kristin L. Fredrickson, DO; Anthony J. D’Angelo, Jr., DO, FOCOO

Abstract
A laryngopyocele forms when a laryngocele becomes infected and fills with mucopus. We report a case of an internal laryngopyocele that presented as airway obstruction in a 34-year-old man; such a presenting sign is exceedingly rare. We also review the anatomy, etiology, and clinical course of the different types of laryngoceles.

Introduction
Laryngoceles arise as a result of a herniation of the sacculcule of the laryngeal ventricle of Morgagni secondary to a prolonged increase in intraglottic pressure. Certain individuals are predisposed to laryngoceles: singers, musicians who play wind instruments, glassblowers, persons with an abnormally long saccule, and patients with chronic laryngitis. Also, a higher incidence of laryngocele has been found in patients with laryngeal cancer as a result of obstruction of the saccule by the carcinoma; while laryngoceles are found in only 2% of adult larynges, they have been identified in approximately 18% of laryngeal cancer cases. It is therefore imperative that the physician perform laryngoscopy on every patient with a laryngocele, not only to rule out laryngeal cancer but to differentiate the lesion from other similar entities (table 1).

Three types of laryngoceles have been described: internal, external, and combined. The internal laryngocele remains within the larynx, whereas the external type extends through the thyrohyoid membrane into the neck and presents as a neck mass. Combined laryngoceles, which are made up of both internal and external elements, are the most common of the three types.

Symptoms may be intermittent. Their onset may not occur until a laryngocele enlarges by becoming filled with air or fluid. The most common presenting symptoms are cough, dysphonia, and a foreign-body sensation. Bryce’s sign—a hissing or gurgling sound produced by manual pressure on an external laryngocele—may occasionally be elicited. However, the maneuver used to elicit this sign may result in respiratory embarrassment secondary to internalizing the mass.

A laryngopyocele forms when a laryngocele becomes infected and fills with mucopus. Laryngopyoceles are rare, as only 37 cases have been previously reported in the world literature. Few laryngopyoceles present as airway obstruction, and even fewer laryngopyoceles present in this manner. We describe a new case of acute airway obstruction secondary to an internal laryngopyocele.

Case report
A 34-year-old man presented to the emergency room with respiratory distress and stridor following a 2-day period of sore throat and a subsequent change in voice. His medical history included diabetes mellitus and coronary artery disease. He drank a six-pack of beer daily but denied using tobacco and illicit drugs.

Physical examination was conducted with the man sitting upright in bed. He was obese and exhibited inspiratory and expiratory stridor and dysphonia. His neck was supple, and no masses were noted. Indirect flexible laryngoscopy at the bedside detected a large, mucosa-covered mass that originated in the left false vocal fold and caused a near-total obstruction of the airway. The lesion formed a ball-valve obstruction during respiration. Computed tomography (CT) showed an 18-mm, low-attenuation mass above the level of the true vocal folds with significant airway obstruction (figure 1). The lesion was confined within the larynx, and it was diagnosed as an internal laryngopyocele.

The patient was taken to the operating room for endoscopic excision of the mass. He was administered general anesthesia and intubated with mild difficulty. Direct laryngoscopy with an anterior commissure laryngoscope revealed that the large laryngopyocele originated in the ventricle and had caused an almost 100% airway obstruction (figure 2, A). The operating laryngoscope was then suspended. The 400-mm objective lens of the microscope was placed, and the laryngopyocele was excised. A large amount of purulent material was removed from the lesion, and cultures were taken. No obvious neoplasm was noted. After the mass was dissected from the left false vocal fold...
and removed, the true vocal folds were visualized, and no additional lesions were noted. Specimens were sent for pathologic evaluation. Phenylephrine and lidocaine pledgets were placed to achieve hemostasis. The vocal folds were reexamined, and they appeared to be normal (figure 2, B). The patient was kept intubated overnight on intravenous antibiotics, and he tolerated extubation the next morning. However, he signed out against medical advice to attend a rock concert that evening.

Discussion

Controversy remains over what constitutes pathologic enlargement of the saccule and how to definitively treat the associated pathology. To review, the laryngeal ventricle is the space that exists between the true and false vocal folds. The saccule is located at the anterior end of the ventricle beneath the false vocal folds. The saccule is lined with respiratory epithelium, and mucous glands in the saccule normally function to lubricate the vocal folds.

Virchow arbitrarily assigned the limit for normal extension of the saccule as the upper border of the thyroid cartilage. However, it seems that the more logical determinant of what constitutes a laryngocele is the presence of symptoms rather than precise anatomic limits.

Table 1. Differential diagnosis of internal laryngoceles

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Description/characteristics</th>
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<tr>
<td>Saccular cyst (laryngeal mucocele)</td>
<td>A mucus-filled congenital cyst of the larynx; no communication with the laryngeal lumen; found in infants and children</td>
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<tr>
<td>Ductile cyst</td>
<td>A simple acquired mucus retention cyst; arises in the lamina propria of the supraglottic larynx</td>
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<tr>
<td>Tracheocele</td>
<td>Communicates with the trachea; may exhibit associated bronchoceles</td>
</tr>
<tr>
<td>Pseudolaryngocele</td>
<td>Associated with advanced destructive disease (e.g., carcinoma, tuberculosis, syphilis)</td>
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Figure 1. CT shows the obstructing mass (arrow) at the level of the thyrohyoid membrane. The mass, which is located above the true vocal folds and is confined to the larynx, is an internal laryngopyocele.

Figure 2. Laryngoscopy shows the laryngopyocele prior to endoscopic decompression and excision (A) and an unobstructed view of the larynx following excision and hemostasis (B).
Approximately 8% of laryngoceles become infected, and symptoms invariably occur. Patients frequently have a history of hoarseness, which may be a sign of an early noninfected laryngocele.

The recommended treatment of a laryngopyocele is immediate endoscopic drainage; additional definitive surgery should be performed via an external approach for external and combined lesions. The additional surgery can be performed either immediately after endoscopic decompression or at a later date. The additional surgery generally involves removal of the superior margin of the thyroid lamina. Endoscopic decompression with marsupialization is generally sufficient to treat an internal laryngopyocele; this avoids the surgical morbidity associated with a neck insult, including possible injury to the superior laryngeal neurovascular bundle.

Laryngopyoceles are rare, and isolated internal laryngopyoceles are particularly rare. Even so, we stress the importance of keeping laryngopyocele in the differential diagnosis of acute airway obstruction (table 2). An understanding of the different types of laryngoceles, their association with laryngeal carcinoma, and the possible complications of laryngopyoceles will help the otolaryngologist identify and promptly treat this unusual cause of airway obstruction.

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References