# Sudden-onset life-threatening stridor in an adult caused by a laryngeal ductal cyst

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## Abstract

*Laryngeal cysts are rare in adults; therefore, the majority of previous reports deal primarily with laryngeal cysts in infants and children. Ductal cysts of the larynx arise from the submucous glands when the ducts of these glands are occluded. They are most commonly located in the vallecula. In this report, we present a rare cause of life-threatening stridor in adults, a large ductal cyst of the larynx that was removed via endoscopic $CO_2$ laser resection. On the basis of clinical observations during the postoperative period, we conclude that endoscopic $CO_2$ laser resection is a reliable and safe method for removing cysts of the larynx. It is also a cost-effective procedure that minimizes hospitalization time and the need for tracheotomy.*


## Introduction

Laryngeal cysts have been classified into *saccular, ductal,* and *thyroid cartilage foraminal* cysts.[1] Ductal cysts of the larynx arise from the submucous glands when the ducts of these glands are occluded. They are most commonly located in the vallecula and are smaller than 1 cm.[2,3]

Because laryngeal cysts are rare in adults, most previous reports deal primarily with laryngeal cysts in infants and children.[4] These lesions usually present with severe stridor and dyspnea in children.[3,5,6] According to Kristensen and Tveterås, almost 50% of the cases have been discovered at autopsy.[7] Adults present more frequently with alteration of voice and, less commonly, with dyspnea.[4]

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Various modalities of treatment, including needle aspiration, incision and drainage, endoscopic marsupialization, laser incision and vaporization, and excision via external or endoscopic approaches, have been utilized for the resection of laryngeal cysts.[3-6,8] In this article, we present a rare cause of life-threatening stridor in adults, a ductal cyst of the larynx that was successfully removed via endoscopic $CO_2$ laser resection. We also comment on the differential diagnosis and management of laryngeal cysts.

## Case report

A 68-year-old man presented with sudden dyspnea and severe stridor. The patient had no significant medical history except intermittent hoarseness; he was otherwise healthy. On the videolaryngoscopic examination, a large supraglottic mass that completely occluded the airway was observed at the level of the left false vocal fold (figure 1, A). The overlying mucosa of the mass was healthy without any erosion or ulceration. No accompanying abnormality was found on the endoscopic examination of the nasopharynx and hypopharynx, and no palpable mass was found on the neck. Computed tomography (CT) of the cervical region revealed that the lesion was a well-demarcated cyst arising from the left false vocal fold with a wide pedicle (figure 1, B).

The patient was urgently admitted for endoscopic $CO_2$ laser resection. The operation was performed under general anesthesia after intubation with a laser-safe endotracheal tube. Intubation was performed more easily than expected. The laryngoscope was positioned for optimum exposure of the left false vocal fold. Care was taken to protect the vocal folds and subglottis from laser impact by placing moistened cottonoid pledgets on the vocal folds and around the intubation tube.

An incision was made with the $CO_2$ laser into the mucosa of the superior surface of the left false vocal

fold (figure 1, C), then the lesion was pulled toward the other side with a microforceps and the incision was deepened laterally to the wall of the cyst. Traction was applied to the lesion, and the $CO_2$ laser beam was used to dissect the plane between the lesion and surrounding tissue. After this dissection was finished, the lesion was completely resected (figures 1, D and 2, A). Bleeding was controlled either by defocusing the $CO_2$ laser beam or by tamponade with cottonoid pledgets soaked in 1:10,000 epinephrine-saline solution.

The patient was discharged the day after the surgery without any respiratory problems, and no medication was required other than analgesics. The pathologist had reported this lesion as a ductal cyst, and the histopathologic examination of the surgical specimen revealed that the lesion was indeed a cystic structure lined with respiratory epithelium under the laryngeal squamous epithelium, and with inflammatory infiltration (figure 2, B). Follow-up at 18 months showed no recurrence of the symptoms or the lesion.

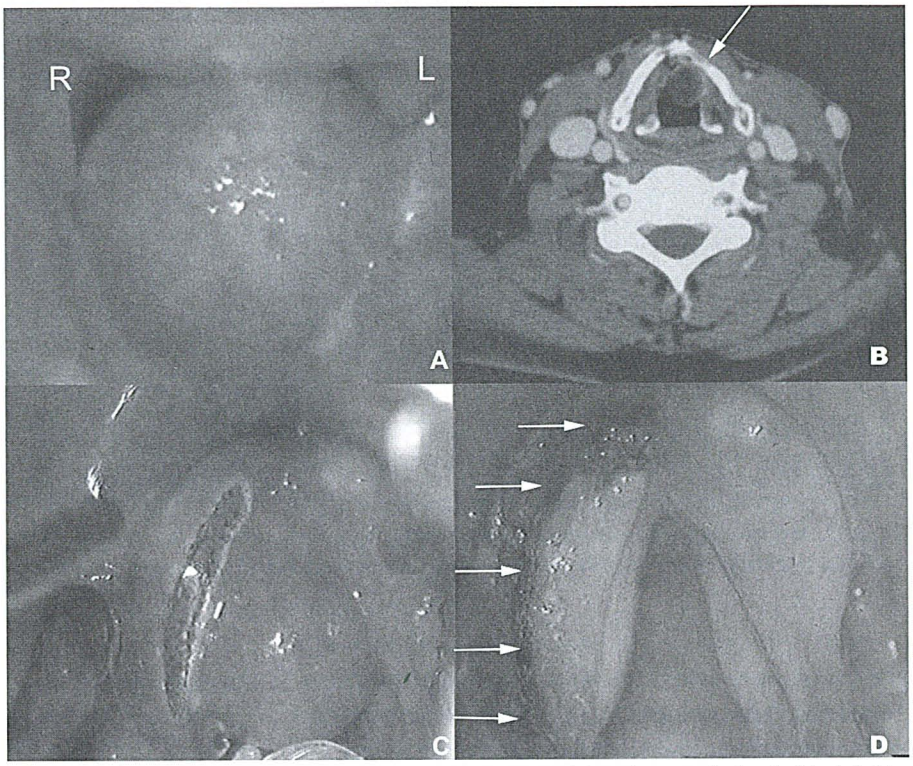



*Figure 1.* ***A:*** *Videolaryngoscopic view shows the large laryngeal ductal cyst at the level of the left false vocal fold.* ***B:*** *CT scan reveals a well-demarcated cyst arising from the left false vocal fold.* ***C:*** *Intraoperative photo shows the incision into the mucosa of the superior surface of the left false vocal fold, made with a $CO_2$ laser.* ***D:*** *This view shows the rima glottidis after complete resection of the cyst.*

## Discussion

The laryngeal saccule is a pouch arising from the anterior end of the laryngeal ventricle.[4] It is variously known as the *sacculus laryngis, appendix ventriculi laryngis, laryngeal pouch,* or *Hilton's sac.*[9] It extends superiorly between the false vocal fold and the inner surface of the thyroid cartilage.[2] The most common lesions of the laryngeal saccule include saccular cysts, laryngoceles, and ductal cysts.[6] A laryngeal cyst can be distinguished from a laryngocele because a laryngocele communicates with the laryngeal lumen, but a laryngeal cyst—which is a mucus-filled dilatation—does not.[1,2]

A ductal cyst of the larynx may occur in the true vocal fold, but our patient's ductal cyst was supraglottic. The large laryngeal ductal cyst completely occluded the supraglottic airway and caused severe dyspnea with hoarseness. It arose from the left false vocal fold and mimicked an internal laryngocele. The definitive diagnosis of this cyst was made by histopathologic examination of the surgical specimen.

Endoscopic examination may be inadequate to differentiate laryngeal cysts from laryngoceles. In that situation, diagnosis can be confirmed by imaging studies that may reveal the exact extension of the lesion. CT scanning is recommended to differentiate internal laryngoceles from laryngeal cysts.[10-12] However, MRI should be the choice if a concurrent laryngeal tumor is suspected.[12,13] Because our patient had severe dyspnea, we chose CT, since it can be performed quickly and eliminates the problems of anxiety and claustrophobia for the patient.

It is also difficult to differentiate a saccular cyst of the larynx from a ductal cyst arising from the false vocal fold. We feel that this differentiation is unnecessary because the current treatment of choice for both lesions is surgical removal.

Management of laryngeal cysts is mainly influenced by

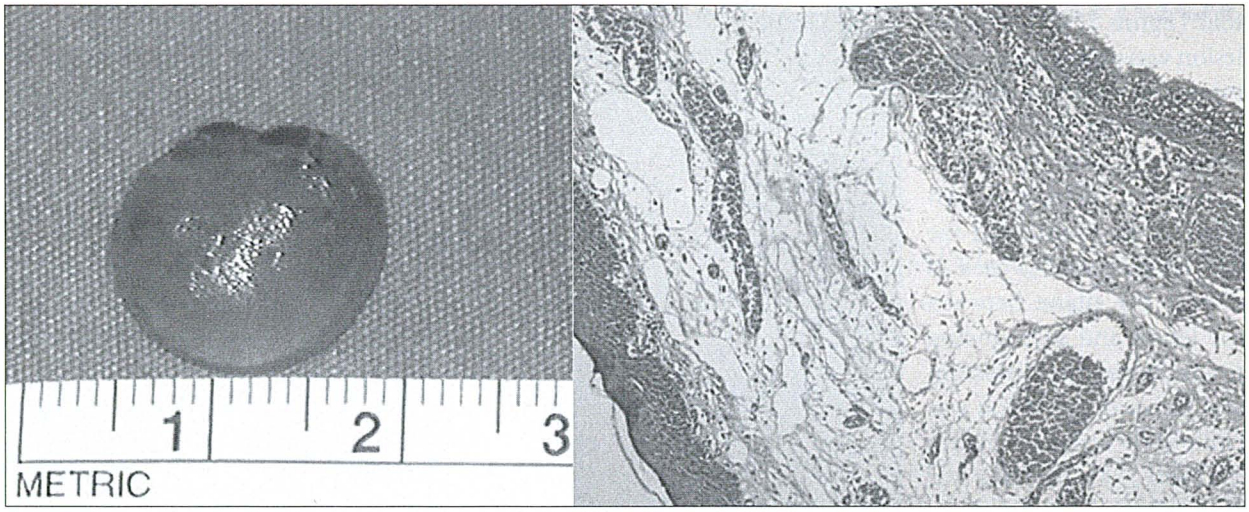



*Figure 2.* ***A:*** *Photo shows the resected cyst.* ***B:*** *Histopathologic examination of the surgical specimen reveals a cystic structure lined with respiratory epithelium under the laryngeal squamous epithelium, with inflammatory infiltration.*

the size of the lesion and the experience of the surgeon. Needle aspiration, incision and drainage, endoscopic marsupialization, laser incision and vaporization, or resection via external or endoscopic approaches all have been used for the removal of laryngeal cysts.[3-6,8]

Although an external approach for submucosal lesions of the larynx has still been advocated by some authors,[13] endoscopic management of laryngeal cysts has gained popularity with the use of the $CO_2$ laser in microlaryngoscopic surgery.[4,8,12] Endoscopic marsupialization of the laryngeal cyst with vaporization of its lining by $CO_2$ laser has been reported as a successful method of treatment for laryngeal cysts,[8] but recurrent cases have also been encountered after failure of endoscopic procedures.[4] Therefore, we believe that total excision of these lesions with minimal laryngeal trauma will prevent recurrence and provide an optimum treatment outcome.

Endoscopic resection with a $CO_2$ laser in our patient resulted in the complete dissection and total resection of the lesion with minimal damage to the endolarynx and true vocal folds. No complications were encountered during or after the surgery. Vocal and swallowing functions were preserved in our patient, and neither tracheotomy nor prolonged hospitalization was required for him. On the basis of clinical observations during the postoperative period, we concluded that endoscopic $CO_2$ laser resection provides a reliable and safe method for removing cysts of the larynx. It is also a cost-effective procedure that minimizes hospitalization time and the need for tracheotomy.

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