

## LARYNGOPYOCELE

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**An apparently healthy 31-year-old man presented with dysphonia. Laryngoscopy revealed a mass at the right side of epiglottis. He underwent a CT examination after intravenous injection of a iodinated contrast agent and this showed the presence of a paralaryngeal mass with rim enhancement. The diagnosis of laryngopyocele was made. Treatment consisted of endoscopic laser surgery, confirming the diagnosis and resolving the symptomatology.**

**Key-word:** Larynx, CT.

First described by Larrey in 1827, then by Virchow in 1867, simple laryngocele is an air-filled dilation of the saccule of the laryngeal ventricle, situated between the false and true vocal cords. While the saccule normally measures 5 to 15 mms, laryngocele will reach few centimeters. It is called laryngomucocele when fluid-filled. If infected and filled with pus, it is a laryngopyocele.

Here is a case investigated by computed tomography after laryngoscopy showed submucosal swelling.

### Case report

A 31-year-old man consulted his physician, complaining only about dysphonia. He reports singing from time to time and no other increasing intraglottic pressure factor. A laryngoscopy was performed first, revealing a smooth-surfaced mass at the right side of epiglottis, pushing to the left both epiglottis and glottic structures.

Our patient went through a subsequent computed tomography with IV contrast which revealed a thin walled fluid-filled low density mass, with rim enhancement (Fig. 1). It was situated in the infra epiglottic paraglottic place, pushing the thyrohyoid membrane although not protruding through. The diagnosis of laryngopyocele was made. Original 3-D reconstructions and virtual endoscopy were performed (Fig. 2).

He went through endoscopic laser surgery and complains no more. The fluid contained in the laryngocele was pus, confirming pyolaryngocele diagnosis. Since surgery was performed, patient's wife reports his husband is no more snoring.

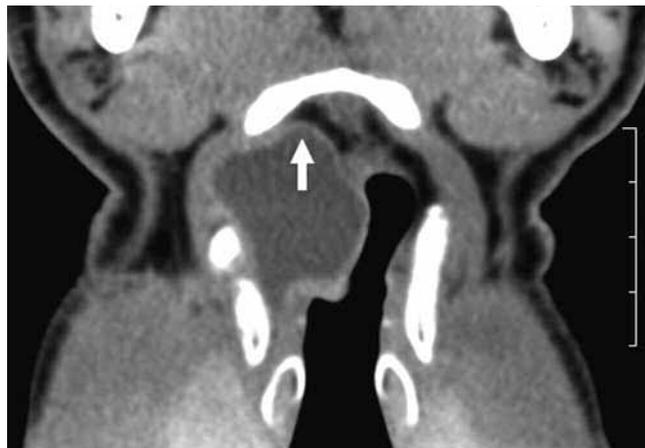


Fig. 1. — CT Scan contrast enhanced, coronal view shows low density mass, with rim enhancement (arrow).

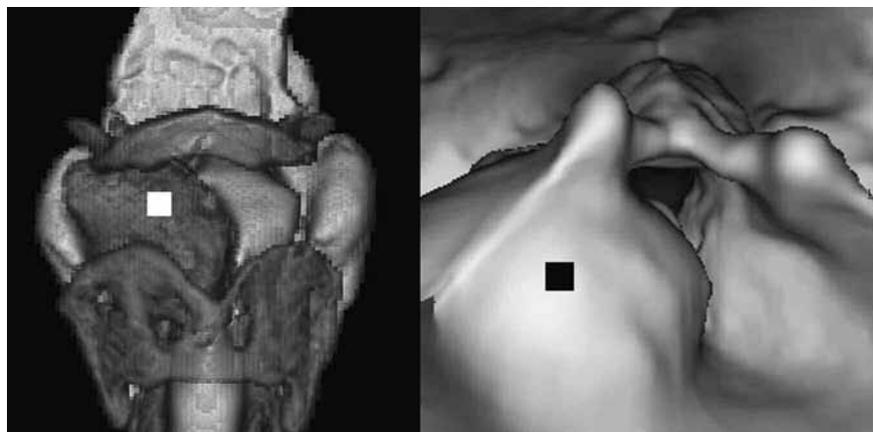


Fig. 2. — 3-D CT scan reconstructions. Left picture, 3-D overview: white square showing the laryngopyocele (upper middle shade is hyoid bone and lower middle shade is crico-thyroid cartilage). Right picture, virtual endoscopy: black square shows submucosal swelling, right sided.

### Discussion

According to the site of extension of the saccule, laryngocele can be

classified as internal, external or mixed type. Internal laryngocele is confined within the larynx, extending above the thyroid cartilage without piercing the thyrohyoid membrane. It extends postero superiorly into the aryepiglottic fold and false vocal folds. External laryngocele extends outside the thyrohyoid membrane to the neck, through what is believed to be a weak point caused by the opening for laryngeal nerves

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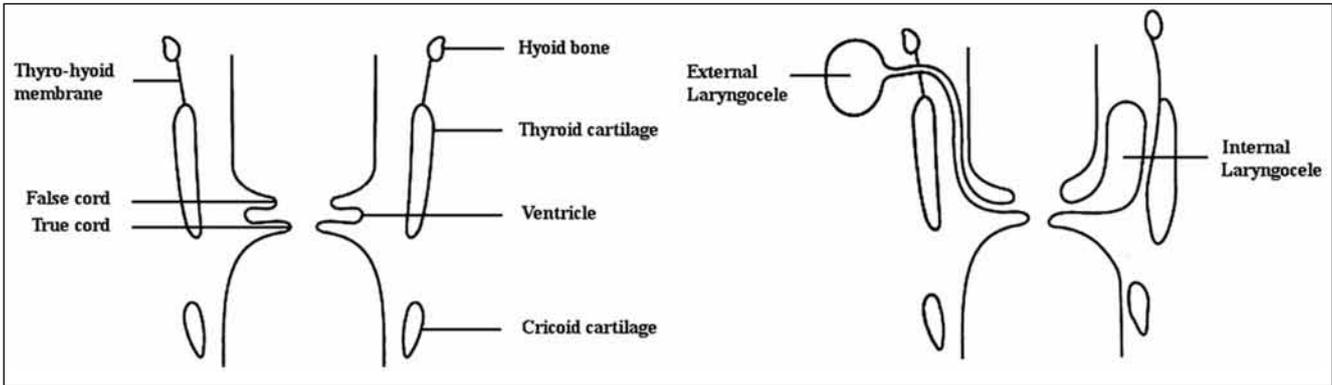


Fig. 3. — Left sided diagram shows normal larynx anatomy. Right sided diagram shows both internal (INT) and external (EXT) laryngocele. [Inspired from: Case of the month: What a blow. *Br J Radiol*, 1998, 71, 799-800].



Fig. 4. — CT scan contrast enhanced. Left picture, axial view showing a mixed laryngocele: an air-filled dilation of the saccule of the left Morgani's ventricle with virtual wall, protruding through the thyrohyoid membrane. Right picture, coronal view showing a laryngomucocele (arrow): a low density mass, with no rim enhancement.

and vessels (uncommonly, a case where the site of penetration was postero superior to the neurovascular bundle has been reported, 1) (Fig. 3). Mixed laryngocele is a combination of both internal and external forms.

Laryngocele is more common in men after the 5th decade and in Caucasian population. It is more commonly acquired than congenital. Chronic increased intralaryngeal pressure may predispose to a laryngocele (for example: singers, glass-blowers, chronic cough, wind instrument players, ...) (3, 4). 80-85% are unilateral with equal frequency between right and left sides (1, 2, 3). Of them, 20 to 40% are internal, 40-50% are combined, and 20-30% are strictly external (2, 3, 5).

Symptoms may include cough, hoarseness, dyspnea, inspiratory stridor, dysphagia, sore throat (2, 3).

The external and combined laryngocele can present as a swelling in the neck at the level of the hyoid bone, anterior to the sternocleidomastoid muscle. It may increase during a Valsalva's manoeuvre and shrink on palpation.

In contrast to a saccular cyst for example, simple laryngocele maintains its communication with the laryngeal lumen. As a matter of fact, the lining of laryngocele contains mucous glands. If mucus does not collect, laryngocele will be an air filled dilation (Fig. 4, left picture). While a laryngeal mucocele is a fluid-filled laryngocele resulting from proliferation of mucous glands when duct is obstructed. Filled with low density mucus, we also talk about "laryngomucocele" (Fig. 4, right picture). If infection occurred (an estimated 8% of laryngoceles become infected (6, 8)), it may fill

with pus. They are then referred as pyolaryngocele and can be a vital emergency.

Ventricular appendix is one of the entities to be considered in the differential diagnosis (11). When air-filled, this normal structure may mimic a small laryngocele but it does not lead to submucosal deformation. Depending on his location, an abscess (peripherally enhancing mass with central low density) can simulate a pyolaryngocele but would usually be surrounded with more inflammatory changes. Regarding cysts, the primary concern will be to define their location. Submucosal cysts are superficial structures protruding into airways and derived from submucosal glands. Their location is variable. Thyroglossal duct cysts are located on the midline, adjacent to mid-portion of hyoid bone and typically extralaryngeal. Second branchial cleft cysts are posterior to sub-mandibular gland, at the angle of mandible and have no connection with the larynx. Finally, lying anterior to epiglottis and typically displacing it posteriorly, vallecular cysts (more common in children) are another possibility.

Laryngoscopy is performed to search for evidence of an occult tumour and a guided biopsy is certainly justified at the entrance of the saccule (2). In a previous study, 17% of the cases of a laryngocele had an associated malignancy (3). That is the reason why patients should undergo laryngoscopy and biopsy (10).

Surgery is treatment of choice. Internal laryngocele can be excised endoscopically with the use of a laser. External or combined laryngoceles are usually approached externally, through the neck (but for the 10 last years, some authors have

published cases of endoscopic laser excision of combined laryngoceles (2)).

### Conclusion

A standard radiography may have shown a soft tissue density projecting against air column in supraglottic region. Otherwise, it would have shown an air pocket in upper neck soft tissues with or without an associated fluid level.

Ultrasound should be used in the initial evaluation of neck masses, to differentiate between fluid filled lesions and solid lesions (3, 7).

Computed tomography scan of the neck – especially coronal reconstructed images – is needed to define the anatomy and nature of the defect. It will characterize and demonstrate very precisely anatomical extent of the lesion (7, 8). Only the laryngopyoceles demonstrated peripheral rim enhancement on contrast CT and a thickening of the wall (6, 7). CT-Scan is also necessary to look for evidence of an occult tumour: incidence of laryngoceles in laryngeal carcinoma patients is

higher than in the normal population (4).

MRI with superior soft tissue resolution, may be alternative, also showing the laryngocele and any associated tumour (10).

Not considering MRI's costs and poor availability, the excellent spatial resolution of a multi slice CT-Scan combined with coronal reconstructions, make contrast enhanced computed tomography an excellent imaging tool (11).

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