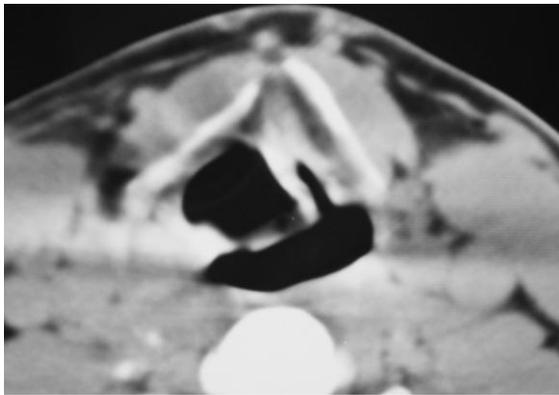




LARYNGOCOELE/LARYNGOCELE: SURGICAL MANAGEMENT Johan Fagan

Laryngocoeles/laryngoceles are dilatations of the saccule of the laryngeal ventricle. They are therefore *supraglottic* cysts, the walls of which are lined by ciliated pseudostratified cylindrical epithelium with variable numbers of goblet cells.

Internal laryngocoeles are limited to the larynx and confined medially by the false vocal cord, and laterally by the lamina of the thyroid cartilage. (Figures 1-3).



Figures 1: Axial views of air-filled internal laryngocoele, confined by the false cord medially and the thyroid lamina laterally

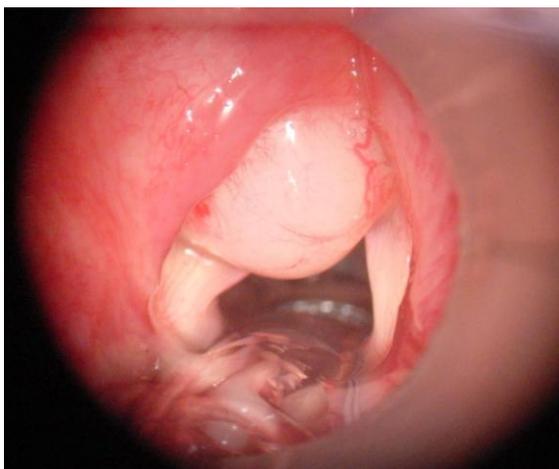


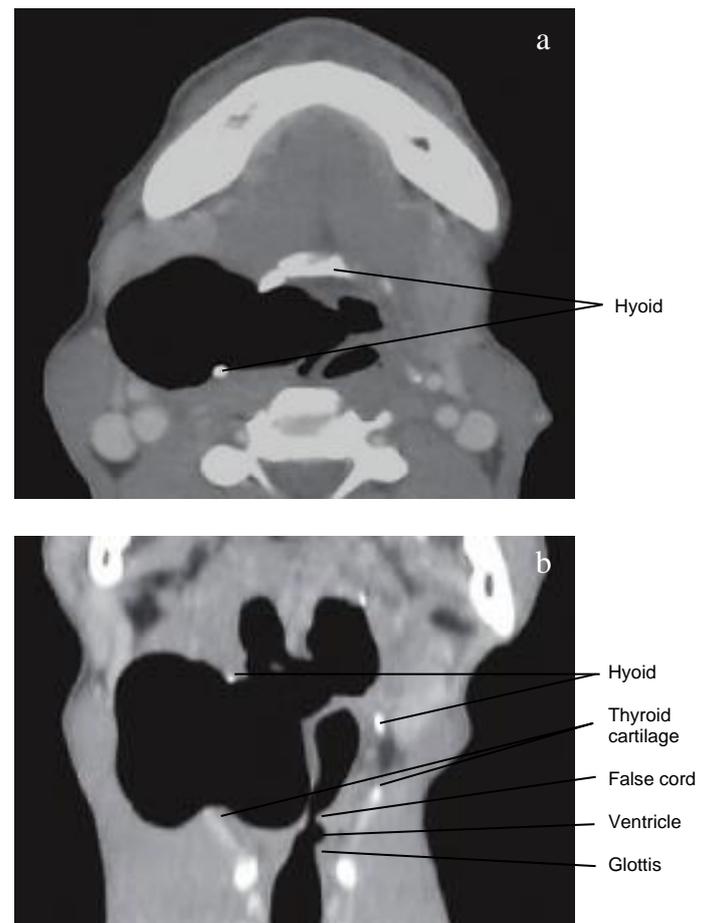
Figure 2: Internal laryngocoele

Combined laryngocoeles extend superiorly and laterally into the neck through the thyrohyoid membrane (between the hyoid bone and the superior edge of the thyroid

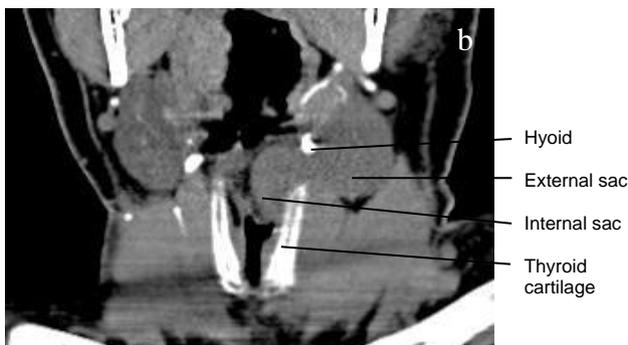
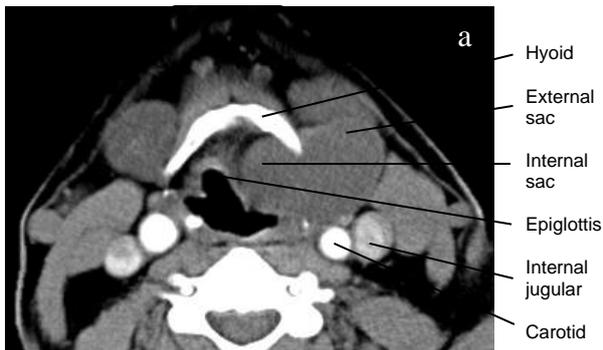
cartilage) in close proximity to the internal branch of the superior laryngeal nerve and superior laryngeal artery (Figures 4, 5, 6).



Figure 3: Internal laryngocoele



Figures 4a, b: Axial and coronal views of combined laryngocoele with wide communication with the larynx¹



Figures 5 a, b: Fluid-filled combined laryngocoele

Laryngocoeles are filled with air when they retain a communication with the laryngeal lumen (Figures 1, 4); when they become isolated from the laryngeal lumen, they become fluid-filled (Figures 3, 5) or infected (laryngopyocoele) (Figure 6).

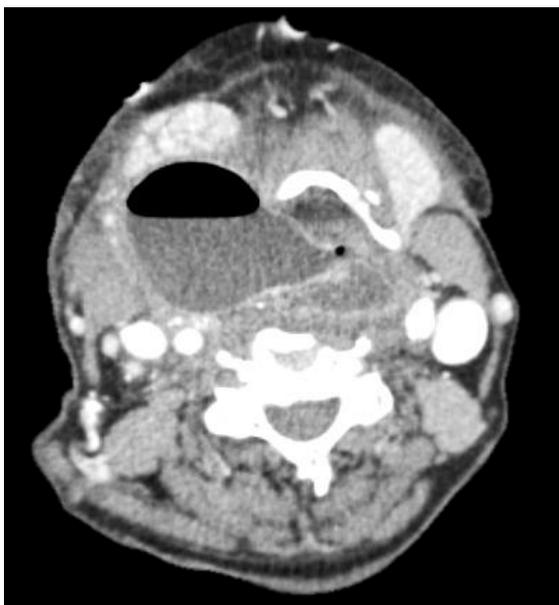


Figure 6: Laryngopyocoele causing airway obstruction

Although not an uncommon incidental postmortem finding, laryngocoeles are generally asymptomatic. Patients may present with **voice change** or a **lateral swelling** in the neck overlying the thyrohyoid membrane which may visibly distend when increasing intraluminal pressure e.g. glass blowers and trumpet or reed instrument players (Figures 7a, b).

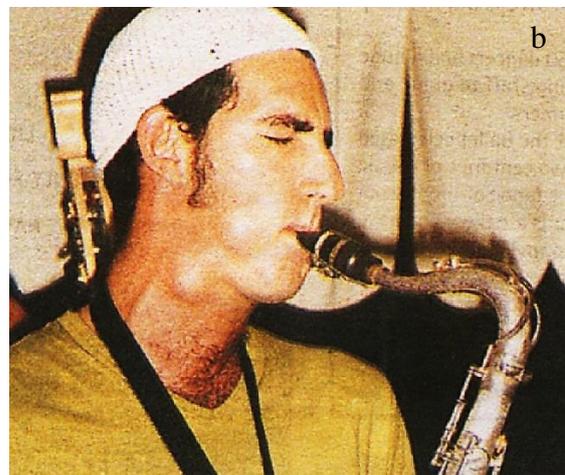


Figure 7a, b: Visible laryngocoeles

Patients, especially those with laryngopyocoeles, may present with **acute airway obstruction** (Figures 6, 8). Occasionally a laryngocoele may be the presenting symptom of laryngeal **malignancy** obstructing the saccule.

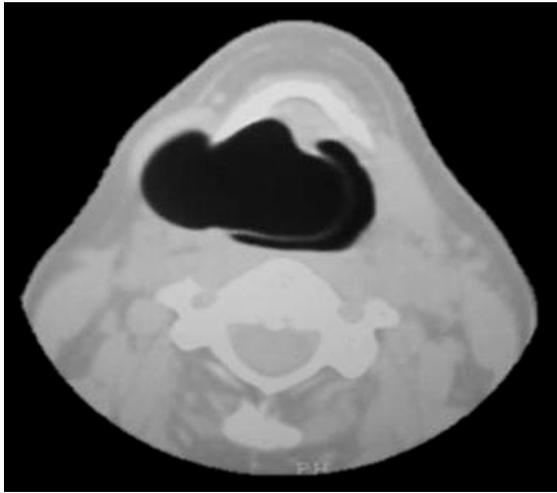


Figure 8: Large air-filled laryngocoele obstructing the laryngeal vestibule²

Surgical Anatomy

The saccule or appendix of the ventricle is present in most larynges. It arises anteriorly in the ventricle and extends superiorly through the paraglottic space with the ventricular fold (false cord) situated medially and the thyroid lamina laterally (Figure 9).

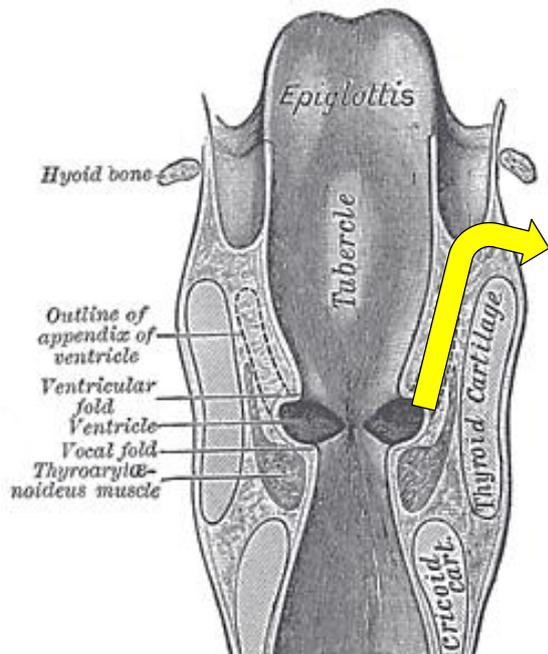


Figure 9: Saccule/ appendix of ventricle and course of laryngocoele (yellow arrow)

The thyrohyoid membrane extends between the body and greater cornua of the

hyoid bone, and the superior rim of the thyroid cartilage. It is pierced by the internal branch of the superior laryngeal nerve and the superior laryngeal branch of the thyroid artery (Figures 10, 11).

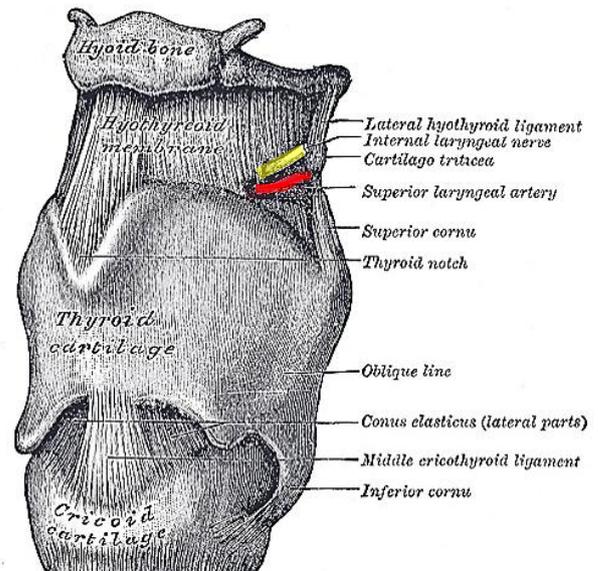


Figure 10: Superior laryngeal nerve, superior laryngeal artery and thyrohyoid membrane

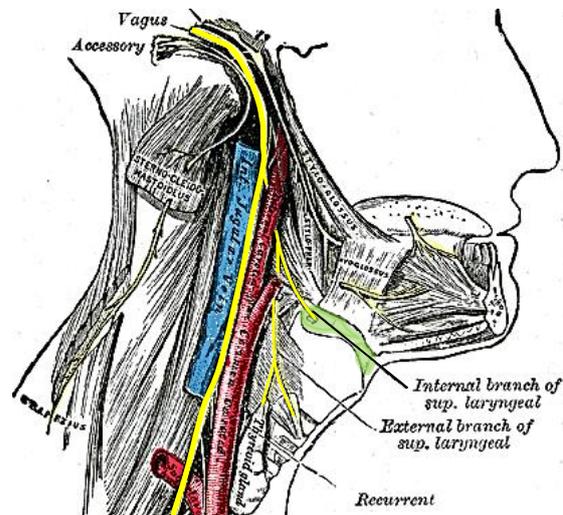


Figure 11: Note how superior laryngeal nerve courses medial to internal carotid artery before piercing the thyrohyoid membrane (green)

The **superior laryngeal nerve** is at risk of injury when resecting a laryngocoele due to its intimate relationship with the exter-

Internal Laryngocoeles (Figures 1-3)

Small, asymptomatic laryngocoeles do not require surgical intervention. Symptomatic internal laryngocoeles and saccular cysts are widely deroofed/uncapped or excised endoscopically, ideally with CO₂ laser. Larger internal laryngocoeles, especially if recurrent, can also be excised by an external approach (see below).

Combined Laryngocoeles

- The surgery is done under general anaesthesia with endotracheal intubation taking care not to rupture the cyst
- Place a transverse skin incision in a skin crease over the thyrohyoid membrane, from the anterior border of the sternocleidomastoid to the midline of the neck (*Figure 14*)



Figure 14: Skin incision over the cyst between hyoid bone and thyroid cartilage

- Elevate subplatysmal flaps to expose submandibular salivary gland superiorly, omohyoid muscle anteriorly and sternocleidomastoid muscle posteriorly

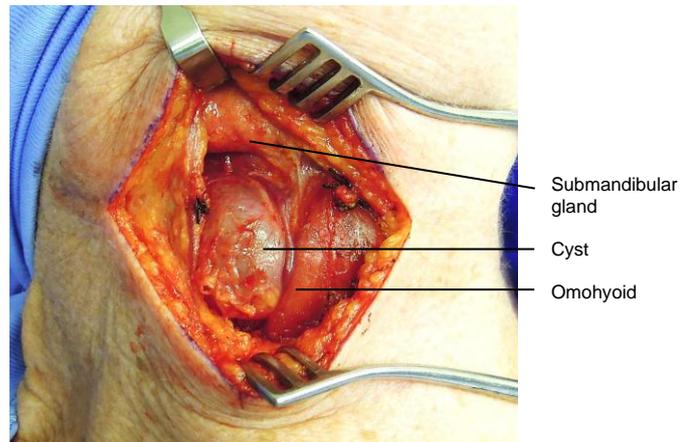


Figure 15: Expose cyst and define the surrounding structures

- Using careful sharp and blunt dissection, find the dissection plane on the thin cyst wall and identify the superior thyroid (STA) and superior laryngeal arteries (SLA) behind the cyst (*Figure 16*)

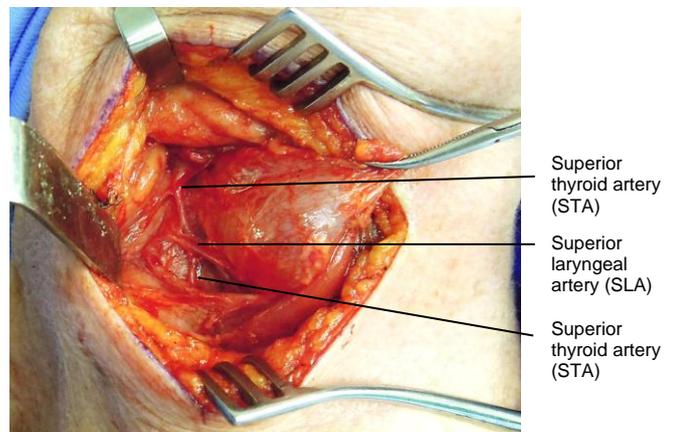


Figure 16: Expose superior thyroid and superior laryngeal arteries

- Identify the superior laryngeal nerve (SLN); it emerges deep to the superior thyroid artery (*Figure 17*)
- Reflect the cyst upwards and retract the omohyoid and thinly stretched thyrohyoid muscles anteriorly to expose thyroid lamina. If necessary, transect the thyrohyoid muscle that overlies the cyst for additional exposure (*Figure 18*)

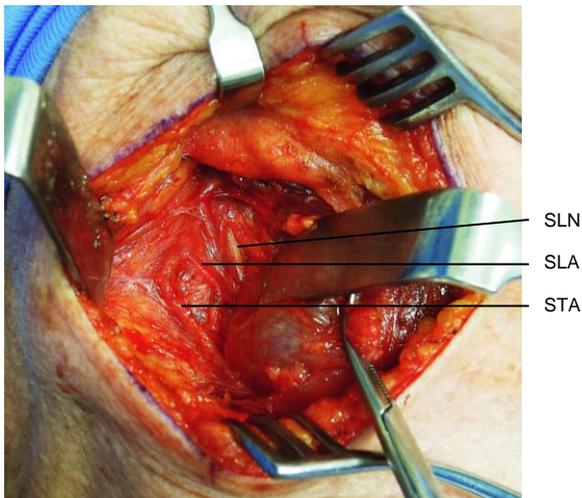


Figure 17: Identify the superior laryngeal nerve (SLN) where it emerges deep to the superior thyroid artery

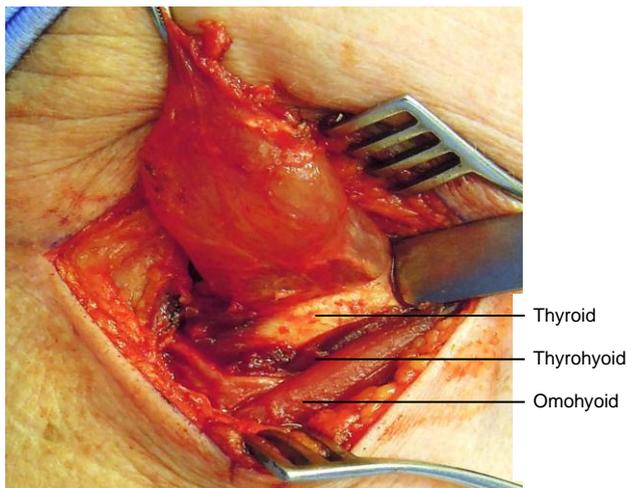


Figure 18: Retract the omohyoid and thyrohyoid muscles to expose the top edge of the thyroid cartilage

- Free the cyst from the perichondrium on the medial aspect of the thyroid lamina and deliver it from the paraglottic space. Carefully peel the cyst off the internal branch of the superior laryngeal nerve and from the mucosa overlying the medial aspect of the aryepiglottic fold, and deliver the cyst (Figures 19, 20)
- Inspect the wound for tears or breaches in the mucosa which, if present, are repaired with absorbable sutures

- Administer 24hrs' perioperative antibiotics should mucosa be breached
- Insert a suction/pencil/corrugated drain and close the wound
- Because mucosal defects would be supraglottic, postoperative surgical emphysema and airway obstruction are unusual

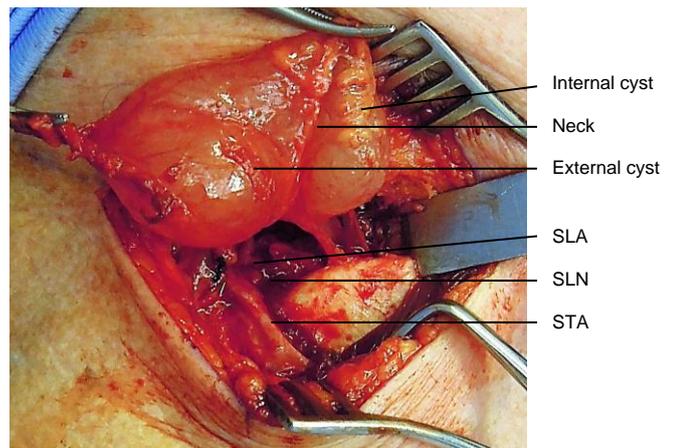


Figure 19: Free cyst from the superior laryngeal artery (SLA), superior laryngeal nerve (SLN) and deliver it from paraglottic space

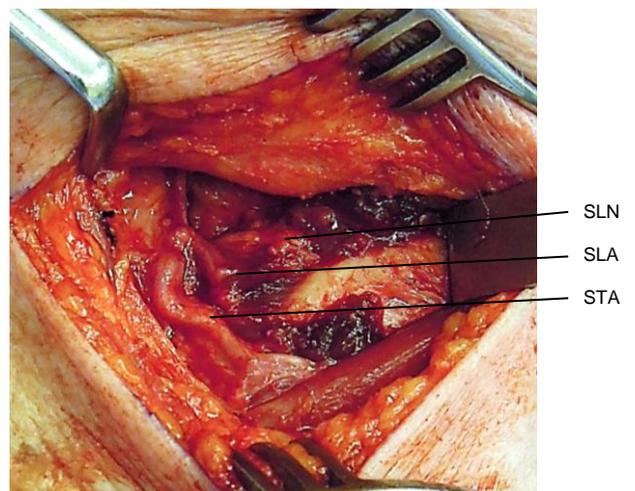


Figure 20: Final view of key structures

To gain additional exposure to the internal component of the cyst in the paraglottic space

- Incise the thyroid perichondrium along the superior and posterior margins of the thyroid lamina (Figure 21)

- Reflect the perichondrium from the lateral aspect of the thyroid lamina with a Freer dissector
- Remember that the vocal cord is situated midway between the thyroid notch and the lower edge to the thyroid cartilage; therefore, make the horizontal cartilage cut above this point
- Cut through the cartilage with a knife/oscillating saw, taking care not to enter the larynx (*Figure 21*)
- Remove and discard the posterosuperior quadrant of the thyroid lamina to gain access to the internal component of the laryngocoele (*Figure 22*)
- Following removal of the cyst, suture the perichondrial flap back to its original position

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How to cite this chapter

Fagan JJ (2014). Surgery for Laryngocoeles (Laryngocoeles). In *The Open Access Atlas of Otolaryngology, Head & Neck Operative Surgery*. Retrieved from https://vula.uct.ac.za/access/content/group/ba5fb1bd-be95-48e5-81be-586fbaeba29d/Surgery%20for%20Laryngocoeles%20_Laryngocoeles_.pdf

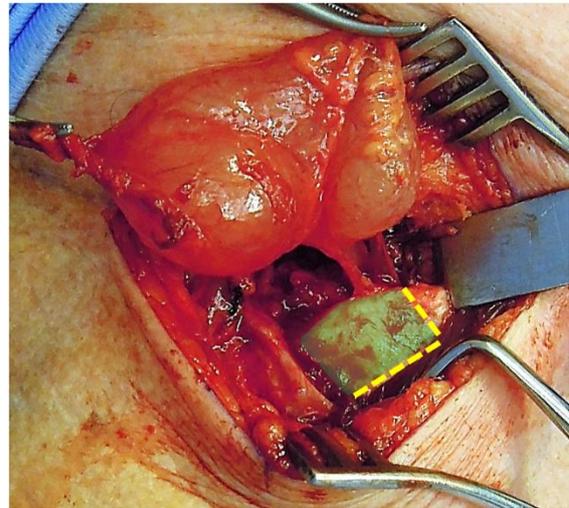


Figure 21: Cuts (yellow line) in thyroid cartilage to remove posterosuperior quadrant of thyroid cartilage (green)

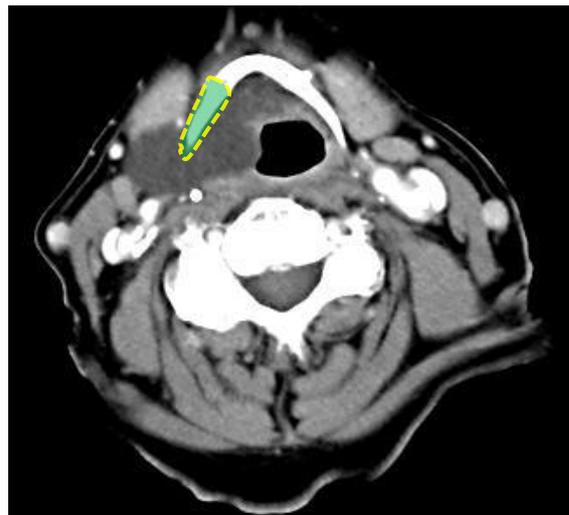


Figure 22: Note how removal of thyroid lamina improves access to internal component of laryngocoele

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