

# Ultrasound and MRI Findings in a Large Combined Laryngeal Mucocele: Case Report

Büyük Kombine Bir Laringeal Mukoselde Ultrason ve Manyetik Rezonans Görüntüleme Bulguları: Olgu Sunumu

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Ultrasound and MRI findings of a large combined laryngeal mucocele were described with special emphasis on the diagnostic features and differential diagnosis.

Key Words : **Ultrasound, Magnetic resonance, Laryngocele, Larynx**

Büyük kombine laringeal bir mukoselin ultrason ve manyetik rezonans bulguları tanısal özellikleri ve ayırıcı tanı üzerinde durularak sunulmuştur.

Anahtar Sözcükler: **Ultrason, Manyetik Rezonans, Laringosel, Laringeal**

A laryngocele is a rare lesion with an estimated incidence of 1 in 2.5 million persons per year which represents an abnormal dilatation of the saccule in contact with the laryngeal space(1, 2). The name laryngeal mucocele or saccular cyst is coined when a laryngocele is filled with mucous and fluid instead of air (2, 3). An internal laryngocele is limited to the interior of larynx; an external laryngocele extends beyond the confines of the thyroid cartilage through the thyrohyoid membrane and penetrates at the site of the entry of superior laryngeal nerve and artery. If both external and internal components exist a combined laryngocele is present (4).

Herein we discuss the ultrasound and MR findings of a large combined type laryngeal mucocele in a 28-year-old male with special emphasis on the diagnostic and clinical features, and differential diagnosis of laryngoceles.

## Case Report

A 28-year-old male presented with hoarseness, frequent cough, dyspnea and foreign body sensation of two months duration worsening at nights while lying down and claimed that the symptoms had started after a severe upper respiratory tract illness. A non-pulsatile mass

was externally visible on the right anterolateral portion of the neck which enlarged with Valsalva's maneuver. He had been smoking twenty cigarettes a day for the last 10 years. The rest of the physical exam and laboratory findings were unremarkable. He did not recall any incidence of overusing his voice.

An ultrasound study was requested to determine the nature of the neck mass, which revealed an infrahyoid anechoic, fluid filled, cystic lesion involving the right aryepiglottic fold, filling the right vestibule, extending externally through the thyrohyoid membrane. Hyperechoic mucous was also identified within the cystic lesion (Fig-1). No evidence of a lymphadenopathy or an associated solid mass was detected. A diagnosis of combined laryngeal mucocele was made.

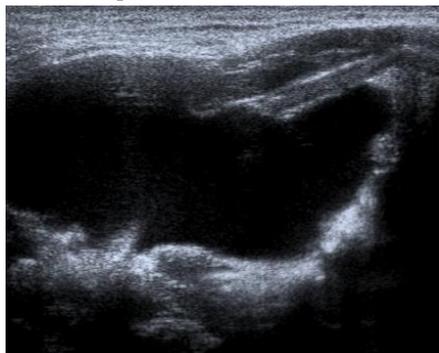
Later an MRI study was done to exclude an associated malignancy, in which on T2-weighted FSEIR images, the laryngeal mucocele was clearly visible due to homogeneous signal hyperintensity of the cystic mass reflecting the fluid content in a background of fat suppression. No air was present within the cystic lesion. The laryngeal mucocele was extending from the vallecula to the true vocal cords, displac-

Received: 28.07.2010 • Accepted: 25.10.2010

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ing the false vocal cords, and filling the pyriform sinus and the ventricle on the right. Extralaryngeal component penetrated through the thyrohyoid membrane (Fig -2). There was no evidence of lymph node disease or obstructing soft tissue component suggestive of malignancy. The patient underwent an uncomplicated resection.



**Figure 1:** An anechoic, fluid filled, combined type laryngocele is depicted in this US image in the transverse plane extending beyond the thyrohyoid membrane laterally and limited by the thyroid cartilage anteriorly. Medially the laryngeal folds are in apposition.



**Figure 2:** On T2 FSEIR sequences in coronal plane the laryngocele is clearly visible as a cystic lesion of high signal intensity with regular, well-defined borders in the background of fat suppression, minimally displacing the laryngeal air space medially, extending from the vallecula to the vocal cords filling the ventricle and extending laterally beyond the larynx through the thyrohyoid membrane.

## Discussion

Laryngoceles are frequently observed in men, with a male to female ration of 5:1 and most come to clinical attention in the 5th or 6th decade (1). Combined laryngoceles account for 44% of all laryngoceles and 10% may

become infected (2). Laryngoceles are either congenital or acquired. Increase in endolaryngeal pressure like in glass blowers, players of wind instruments, singers and street hawkers or presence of a lesion that causes stenosis of the saccule neck may predispose to laryngocele development (4, 5). Although most laryngoceles are small in size and asymptomatic, they may present with hoarseness, dysphagia, pain and foreign body sensation. External laryngoceles depending on the size may present as a visible neck mass that change size in Valsalva's maneuver (1). Compression of the mass may cause a gurgling sound known as Bryce's sign (2).

Size, presence of infection and possible association with malignancy should be evaluated with scrutiny during imaging and other cystic laryngeal lesions should be ruled out. Size partially influences the severity of symptoms (1). Serious, life-threatening upper airway obstruction due to a giant laryngocele and even death secondary to mucous aspiration in a critically narrowed airway has been reported (1, 6). Therefore airway patency needs to be carefully assessed.

Superimposed infection may cause acute flare or exacerbation of the existing symptoms therefore imagers should be aware of the signs of infection (2). CT imaging is especially advantageous in this regard because radiological signs of inflammation such as wall thickening or rim enhancement of the laryngocele could be easily demonstrated (2,7). Neck ultrasound proves to be useful because it allows quick and real time diagnosis. The most useful input of the US exam is differentiation of a cystic mass from a solid lesion and US diagnosis is most accurate if the space is filled with fluid instead of air or mucous. The dimensions of the lesion could be easily assessed whether it is external or internal, the content is better visualized either purulent, simple fluid, mucous or air and also ultrasound may act as a guide for aspiration of cysts contents (7).

In our case nor history or occupation indicated an acquired laryngocele secondary to increased intralaryngeal

pressure. Therefore, on imaging, we specially focused on ruling out an associated malignancy or an obstructing lesion involving the saccule and our patient had direct laryngoscopic examination to rule out laryngeal cancer prior to imaging. MRI or CT imaging with contrast are especially helpful in ruling out other possible associated lesions with laryngocele such as laryngeal carcinoma, squamous cell carcinoma, amyloidosis, papilloma, cord leukoplakia, tuberculosis, scleroma, adenolymphoma, granular cell tumor, chordoma (2,4,8). These imaging modalities offer better resolution and the relation of the lesion with the surrounding tissues is better displayed especially when the lesion is totally filled with air which is disadvantageous for ultrasound imaging. Lymph node stations should also be carefully evaluated and US, CT and MRI are all successful in this regard. Fortunately preoperative imaging studies and postoperative pathologic studies did not reveal any focus of malignancy in this patient.

Laryngoceles may rupture; rupture may cause emphysema of the subcutaneous tissues (5) or lateral pharyngeal space infection (1). Imagers should also be aware of other cystic lesions that are included in the differential diagnosis of laryngoceles such as thyroglossal duct cysts, branchial cleft cyst, cystic hygroma, tracheocele and parapharyngeal abscess (2, 5). If the cystic nature of the lesion could not be inferred from the imaging studies solid lesions such as paraganglioma, schwannoma, lipoma and lymphadenopathy should also be considered in the differential diagnosis (2, 5). The typical localization and radiological pattern of these lesions are most helpful during decision making.

In conclusion, laryngoceles are saccular cysts which are either limited to the larynx or extend beyond the confines of the larynx. US is a practical and often diagnostic imaging modality. Imagers should be aware that although laryngocele is a benign entity, possible association with a malignancy or life threatening upper airway obstruction warrants further examination and imaging.

## REFERENCES

- 1- Pennings RJE, Van den Hoogen FJA, Marres HAM. Giant laryngoceles: a cause of upper airway obstruction. *Eur Arch Otorhinolaryngol* 2001; 258: 137-140.
- 2- Jahendran J, Sani A, Rajan B, Mann GS, Appoo B. Intravenous neck injections in a drug abuser resulting in infection of a laryngocele. *Asian J Surgery* 2005; 28 (1): 41-44.
- 3- Swartz JD, D'Angelo AJ Jr, Harnsberger HR, Zwillenberg S, Marlowe FT. The laryngeal mucocele. *Imaging analysis of a rare lesion. Clin Imaging* 1990; 14(2): 110-115.
- 4- Cankaya H, Egeli E, Unal O, Kiris M. Laryngeal amyloidosis a rare cause of laryngocele. *J Clin Imaging* 2002; 26: 86-88.
- 5- Nazaroglu H, Ozates M, Uyar A, Deger E, Simsek M. Laryngopyocele : signs on computed tomography. *Eur J Radiol* 2000; 33: 63-65.
- 6- Satou T, Naito T, Hayashi Y, Hashimoto S, Sugiyama S. A sudden death case of laryngocele accompanied by infarction of the dorso-lateral portion of the medulla oblongata. *Legal Med* 1999; 1: 257-261.
- 7- Van Vierzen PB, Joosten FB, Manni JJ. Sonographic, MR and CT findings in a large laryngocele: a case report. *Eur J Radiol* 1994; 18: 45-47.
- 8- Papila I, Acioglu E, Karaman E, Akman C. Laryngeal chondroma presenting as a laryngopyocele. *Eur Arch Otorhinolaryngol* 2005; 262: 473-476.