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A Large Internal Laryngocele: Difficult Intubation: Case Report

Büyük İnternal Laringosel: Zor Entübasyon: Olgu Sunumu

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ABSTRACT

Laryngoceles are defined as air-filled cystic dilatations of laryngeal saccule. They are usually asymptomatic pathologies. The large volumes and specific extensions cause serious symptoms clinically such as dyspnea, sleep apnea, hoarseness. Surgical excision under general anesthesia is the recommended way of management in symptomatic cases. There are number of facts to be considered primarly for the safe anesthesia in the management of such pathologies. Large volume masses avoid the precise visualization of upper airway and complicates the intubation. In this case the large laryngocele occluding the laryngeal inlet avoided the visualization of the vocal folds and insertion of intubation tube. The endotracheal intubation was accomplished under the rigid telescopic vision and wire guidance. The primary advantages of the technique was to avoid tracheotomy thus the postoperative morbidity, shortened operation time and endoscopy assisted and wire guided safe intubation.

Keywords
Laryngoscopy; laryngocele; airway; obstruction; dyspnea; endotracheal intubation; guide wire

ÖZET

Laringoseller hava dolu kistik dilatasyonlar olarak tanımlanır. Genellikle semptomsuz patolojilerdir. Büyük hacimler ve genişleme özellikleri dispne, uyku apnesi, ses kısıklığı gibi önemli klinik bulgulara yol açar. Semptomatik olgularda ilk seçenek tedavi genel anestezi altında cerrahi eksizyondur. Öncelikli olarak anestezi risklerini azaltarak cerrahi için güvenli anestezi sağlamak amaçtır. Bu olguda larenks girişini kapatan geniş hacimli laringosel vokal kordların görülmesini engelleyerek entübasyonu zorlaştırdı. Endotrakeal entübasyon, rigid teleskopla endoskopik görüş altında ve klavuz tel kullanılarak sağlandı. Bu tekniğin primer avantajları trakeotomiyi engelleyerek postoperatif morbiditeyi azaltması, operasyon süresini kısaltması, endoskopik görüş altında tel klavuzluğunda güvenli anestezi sağlamasıdır.

Anahtar Sözcükler
Laringoskopi; laringosel; havayolu; obstrüksiyon; dispne; endotrakeal entübasyon; klavuz tel

The case report that we send to your journal was presented as printed poster; in 32. Turkish National Congress of Otorhinolaryngology and Head&Neck Surgery with "A LARGE INTERNAL LARYNGOCELE: DIFFICULT INTUBATION" title and specified name order.

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INTRODUCTION

Laryngoceles are air-filled dilatations of laryngeal saccule communicating with the laryngeal lumen. The etiology and incidence is unknown The local laryngeal pathologies may be predisposing factors. They are usually asymptomatic. In a cadaveric study enlarged laryngeal saccules were reported in 21.5% of cadavers. Laryngoceles are more commonly found in men in a 5:1 ratio, in their fifth or sixth decades of life.[1] They may be congenital or acquired.

The abrupt pressure changes during coughing, straining, trumpet playing may cause sudden manifestations. They may be distended with mucous or pus in case of infection and called laryngopyocele.[2,3]

The laryngoceles may be congenital or acquired. There are three types of laryngocele classified as internal, external and mixed types in respect to location. The internal laryngoceles do not penetrate the thyrohyoid membrane, they protrude laryngeal lumen or may extend supraglottically to aryepiglottic fold and ventricular folds.[4,5] The supraglottic extension may occlude laryngeal inlet and cause dyspnea and/or airway compromise. The external laryngoceles extend superiorly to the lateral neck through the neurovascular opening in the thyrohyoid membrane. They present as a mass in the neck lateral to the sternocleidomastoid muscle at the level of the hyoid bone. The mixed type is the combination of external and internal types. The two-thirds of the laryngoceles are unilateral.[4] The diagnosis is based on clinical examination. Supported by further radiological imaging including CT and MRI. Although still controversial the association of laryngoceles with laryngeal carcinoma was reported previously.[4,7] The management is primarly surgical, ideally the excision of the cystic saccule totally with its pedicle. The endoscopic CO_2 laser excision of internal laryngoceles were reported to cause lesser edema and postoperative adhesions.[6,9] The biopsy of the laryngeal ventricle is important to exclude the possibility of laryngeal carcinoma.[5,7,8]

We present a case of an internal laryngocele occluding the laryngeal inlet preventing the visualization of the vocal folds and insertion of intubation tube. The endotracheal intubation was accomplished under the rigid telescopic vision and wire guidance. There are no reports describing the technique previously. Institutional review board (IRB) approval and informed consent from the patient was taken.

CASE REPORT

A 67 years-old male patient was seen with the complaints of increasing daytime dyspnea, cough, sleep apnea, and hoarseness over last 6 months. He was unable to sleep in recumbent and right lateral position at night due to obstructive apnea. He had severe snoring (VAS 10) and apnea periods longer than 10sec during sleep as witnessed by his partner. His laryngoscopic examination with rigid 70 degree endoscope (Karl Storz, Tuttlingen, Germany) revealed a left sided smooth contoured, mobile, pedunculated, cystic mass in the supraglottic region obstructing laryngeal inlet. Contrast enhanced CT revealed a cystic mass orginating at the level of pyriform sinus (Figure 1).

He was scheduled for the excision of the mass under suspension laryngoscopy. Endotracheal intubation prior to surgery was compelling. The mass was found to be expanded twice the original size and extended to the tongue base following supine position and ventilation with mask in the induction stage of anesthesia just prior to the tracheal tube insertion (Figure 2).

The insertion of anesthesia tube could not be managed with routine laryngoscope blade due to fully obstructed laryngeal inlet by mass. Under the present circumstances intubation was achieved using a different technique to avoid tracheotomy considered as final alternative management owing to potential morbidities. Intraoral endoscopic visualization of oropharynx on the monitor is accomplished by 0 degree rigid urologic telescope (Karl Storz, Tuttlingen, Germany) with the assistance of the laryngoscope blade. Simultaneously

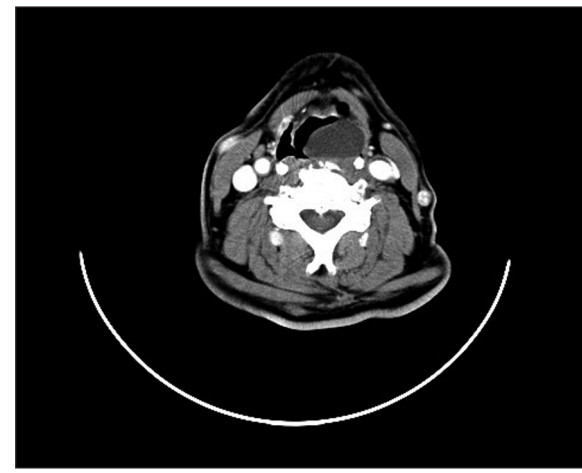


Figure 1. Contrast enhanced CT.

external assistance maneuver was applied on the neck by pushing thyroid cartilage from the mass side (left) to the right side to facilitate the vision of vocal cord level. Under telescopic vision a guide wire was loaded by the anesthesist laterally from the right side of the mass following a hardly observed narrow path to the laryngeal lumen through the vocal cords. An endotracheal tube (ETT) with internal diameter of 6 mm (Mallinckrodt inc, Missouri, USA) was fed on the guide wire. The advancement and insertion of the ETT was followed by removal of the guide wire (Figure 3-5).

The rest of the anesthesia and surgery was uneventful. The laryngocele was marsupialized following partial excision with CO_2 laser (Ultrapulse 5000c; Coherent, Palo Alto, CA, USA) (Figure 6-8). In postoperative period dyspnea disappeared immediately and tracheotomy was not required. Patient was discharged day after. The voice quality improved with the disappearance of hoarseness in the following weeks. The sleep apnea symptoms improved. Histopathological evaluation revealed layngocele with proliferated stratified squamous epithelium, acanthosis, edematous stroma and mononuclear cell infiltration. In the postoperative period the laryngeal endoscopy did not reveal additional pathology and recurrence. The patient is on the first year of the follow-up.

DISCUSSION

Laryngoceles are usually asymptomatic but may present with respiratory obstruction, sleep apnea and stridor upon narrowing or obstructing the laryngeal lumen.[2,4,5] Indirect laryngoscopic examination and CT is important for definite diagnosis, supported by postoperative histopathological evaluation.[4] Surgical excision is the recommended treatment option for the symptomatic laryngoceles either through endoscopic or external approach.[4,9] In this case gradually increasing dyspnea, stridor and obstructive sleep apnea was the major complaints. In the management plan possible intubation adversity and successive necessity of the peri-

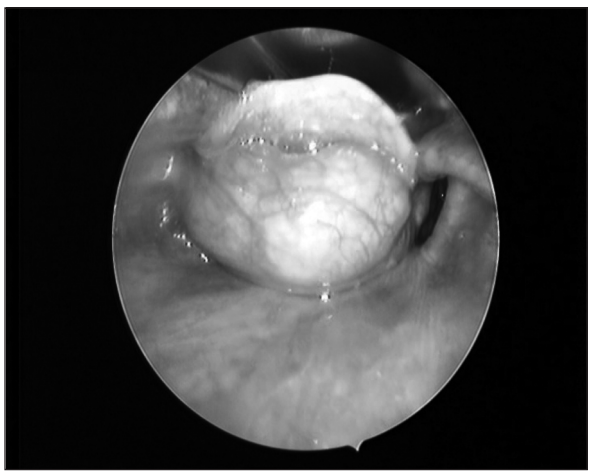


Figure 2. The mass was extending to the tongue base.

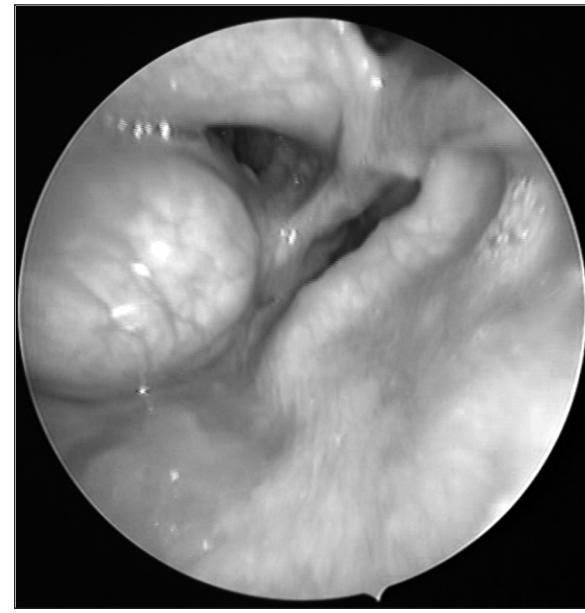


Figure 3. The exposure of laryngeal inlet and vocal cords was provided under endoscopic vision with compression of the laryngocele saccule through external laryngeal maneuver and endoscopic assistance.

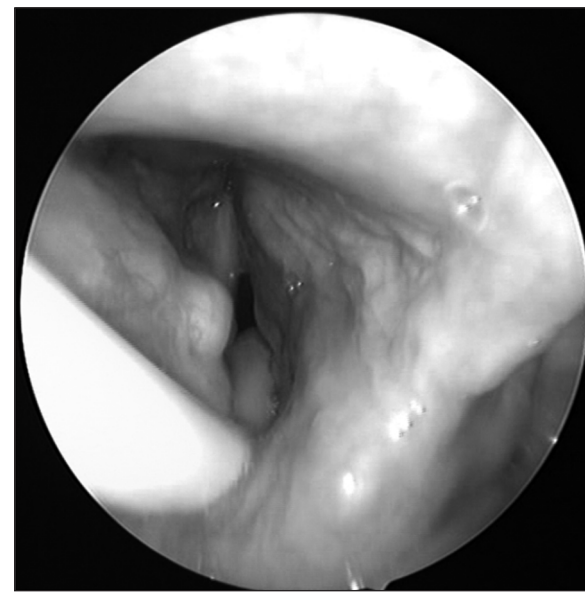


Figure 4. The positioning of the guide wire through the narrow laryngeal inlet after maintainence of exposure with the assistance of endoscope and external laryngeal maneuver.

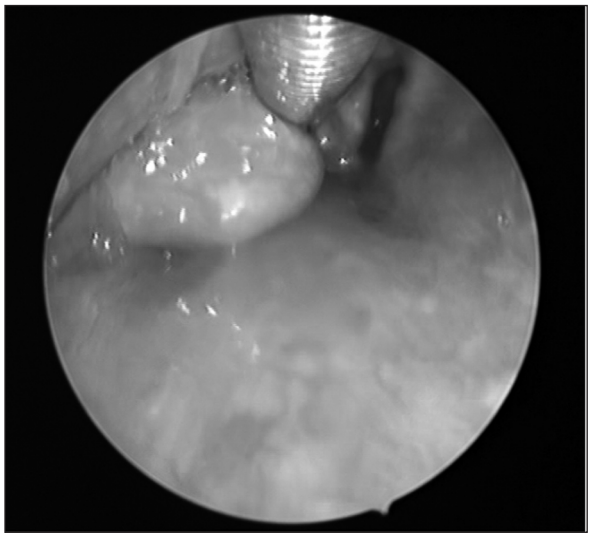


Figure 5. The insertion of endotracheal tube (ETT) was followed by the removal of guide wire.

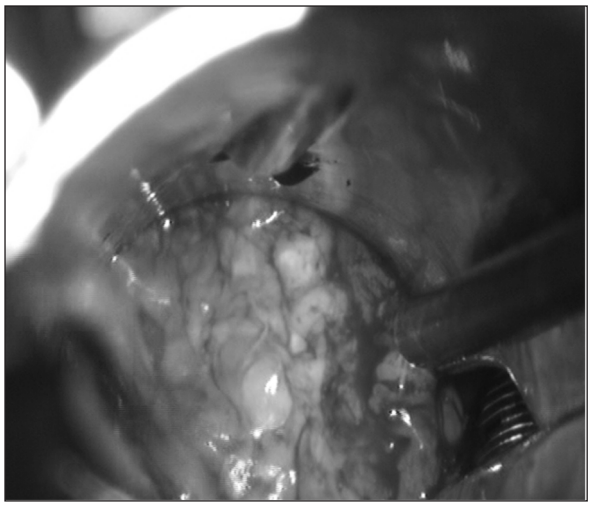
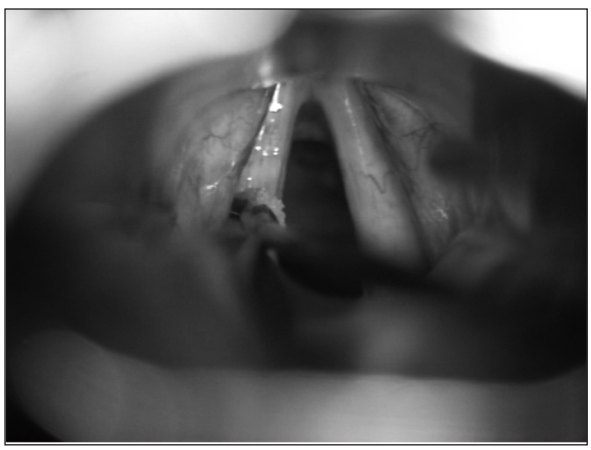


Figure 6. The perioperative view: CO_2 laser excision of laryngocele.

operative tracheotomy prior to surgery was considered and patient was informed. Supine surgical position, mask ventilation and highly mobile structure caused inflation and cranial displacement of the lesion towards oropharynx. This fact should always be kept in mind in large supraglottic masses. In this case the pedicle, soft and elastic nature increased the mobility. Endotracheal intubation was managed under endoscopic guidance using guide wire together with laryngoscope to avoid tracheotomy. Tracheotomy can be avoided in certain cases in whom slight postoperative laryngeal edema is expected. In this case serious edema was not expected due to cystic nature and localization of the lesion. It was also predicted that the excision of the large mass would relieve the laryngeal airway postoperatively. In fact the most challenging part of the surgery was the induction of anesthesia and intubation phase. The following phases including the excision of the lesion and extubation of the patient was smooth.

The main concern in such cases is to induce anesthesia and achieve intubation without the airway compromise. Although tracheotomy is the gold standard in airway management in inevitable cases, awake fiberoptic intubation is an alternative reported technique in the management of difficult airway, including deep neck space infections.[5] The needle aspiration of the cyst to reduce the mass prior to the anesthesia is an alternative technique to be considered in large laryngoceles. In this case the high agitation and anxiety index of the patient hindered such a procedure. An experienced anesthetist is critical for the intubation technique used in this patient. On the other hand this technique permits endotracheal intubation in obstructed and hardly visible airway passage and secures the airway through regular approach



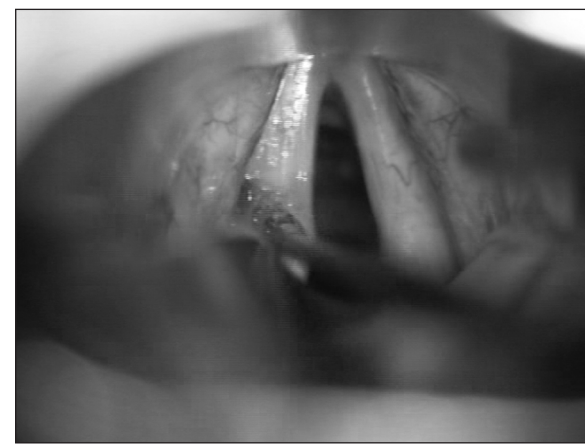


Figure 7,8. The endolaryngeal view after total excision.

using the advantage of precise endoscopic view for the guidance thus avoiding tracheotomy.

CONCLUSION

The laryngoceles due to their elastic nature, cystic structure, expansile feature and localization have the risk of airway compromise. This fact turns their management into a challenge. Various approaches and techniques were defined previously to achieve induction of anesthesia and endotracheal intubation while securing the airway. The technique used in this patient may be a contribution to the previously defined approaches.

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