

The case of laryngopyoceles and acute respiratory disorder

Przypadek przepukliny kieszonki krtaniowej wymagającej tracheotomii

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ABSTRACT:

Laryngocele is an air-filled or fluid-filled abnormal dilatation of laryngeal saccule. The paper presents the case of tracheotomy in acute respiratory disorder due to laryngopyoceles in a 76-year old woman. The patient was complaining of swelling of the neck for 3 days before admitting to the hospital. The tracheotomy was performed to quickly secure an airway prior to progression of the swelling. Computed tomography examination showed the presence of a mixed-type laryngocele both sides – on the right air-filled and on the left fluid-filled. First the acute infection was treated with antibiotics and then the laryngopyocel was surgically removed from external approach. The tracheotomy removal was few days after surgery. A review of the literature is also presented.

KEYWORDS:

larynx, mixed type laryngocele, laryngopyocel

STRESZCZENIE:

Przepuklina kieszonki krtaniowej jest patologicznym poszerzeniem kieszonki krtaniowej. Gdy dochodzi do jej powikłania pod postacią nadkażenia, światło przepukliny wypełnia się treścią śluzowo-ropną (laryngopyocel). Taki stan może objawić się bardzo dokuczliwymi dla pacjenta dolegliwościami od silnego bólu do ciężkiej duszności włącznie. Praca opisuje przypadek ostrej duszności wymagającej pilnej tracheotomii w przebiegu zakażonej przepukliny kieszonki krtaniowej o 76-letniej pacjentki. Przegląd literatury, symptomatologia, metody leczenia oraz dostępne badania obrazowe zostały opisane.

SŁOWA KLUCZOWE: laryngocele, laryngopyocel, przepuklina kieszonki krtaniowej

INTRODUCTION

Laryngocele is a pathological widening and indentation of the laryngeal saccule into the laryngeal wall. This disease entity is in many cases asymptomatic and is detected in CT or magnetic resonance imaging by accident. The air indents the mucous membrane deep into the sinus of Morgagni (laryngeal saccule) creating an internal hernia medially limited by the vestibular fold and laterally to the thyroid cartilage. Passing of the lesion through the thyrohyoid membrane causes the occurrence of a mixed (internal and external) laryngopyocel. The lumen of the hernia stays in communication with the laryngeal lumen.

The nature of the ailment depends on the location of the hernia in relation to the thyroid cartilage. Patients with an internal lesion demonstrate a sensation of a mass stuck in the larynx or throat, hoarseness, discomfort in the throat, snoring or dysphagia. People with an extra-laryngeal lesion complain about the size of the neck circumference or visibility of the neck tumor through the skin [1, 2, 3, 4]. Most often the lesion is acquired, benign. Its formation is predisposed by states of increased glottal air pressure - among others playing on wind instruments, intensified, chronic cough (for example in the course of emphysema or chronic bronchitis), abnormal atrial phonation, frequent Valsalva maneuver (for example, with bo-

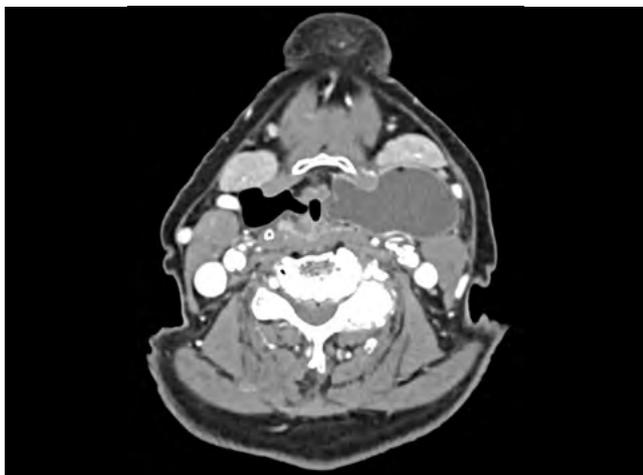


Fig. 1. Bilateral, mixed, air and fluid – filled laryngocele.

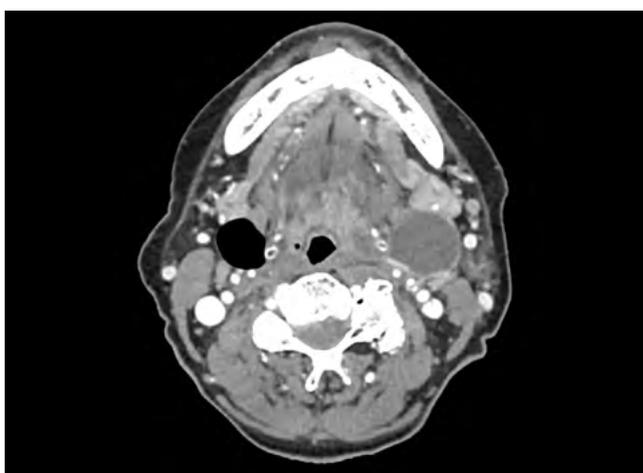


Fig. 2. Axial views of air-filled, mixed rightside laryngocele and fluid – filled, mixed left side laryngomucocele.

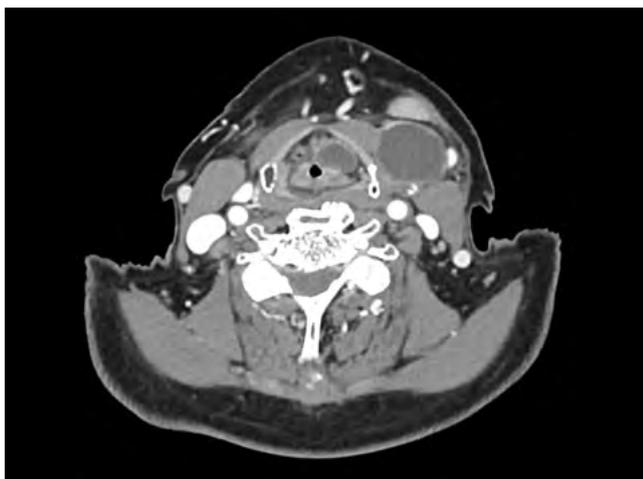


Fig. 3. Internal and external left side laryngomucocele.

dybuilders lifting weights) professional singing or glass blowing [2]. Hernia can be filled with air (laryngocele), mucus (laryngomucocele) or infected content (laryngopyocele) [3, 4]. There are cases of congenital laryngocele resulting in respiratory disorders in newborns or small children [5]. Cases of acquired hernias are also probably related to genetic background that gives predisposition to the development of hernia in chronic conditions of increased laryngeal air pressure. There are some cases of laryngocele diagnosed in patients who do not have a history of disturbance of laryngeal airflow [1]. Imaging diagnostics uses endoscopic examination of the larynx, ultrasound examination, computed tomography and magnetic resonance [6, 7, 8]. The last two studies most accurately illustrate the extent of laryngocele [2, 8].

CASE REPORT

A 76-year-old female patient was admitted to the Laryngology department of the Provincial Specialist Hospital in Rybnik due to sudden laryngeal dyspnea. An interview with the patient revealed a tumor of the neck on the left side growing for 3 days. Laryngeal examination revealed vocal folds thickened as in chronic laryngitis, symmetrically mobile on both sides, slit-shaped glottic gap, smooth and symmetrical vestibular folds, swelling of the posterior commissure and arytenoid cartilage, reddening of the left arytenoid cartilage and free piriform sinus. The ultrasound image showed a pathological, polycyclic mass on the left side, with the echogenicity of a dense fluid, and an approximate dimension of $4.5 \times 3.7 \times 4$ cm. Its medial part showed a visible 10-mm wide canal which could not be traced at a further section. The major chamber near the posterior wall of the laryngeal cavity showed hyperechogenic bands with a positive echo - suspicion of gas bubbles. In addition, there were hyperechogenic bands with a positive echo in the neck in the middle and slightly on the right in the subcutaneous tissue - suspicion of free air under layers. The surrounding lymph nodes were slightly enlarged. Signs of edema in the surrounding subcutaneous tissue were also emphasized. Laboratory tests confirmed an increasing hypoxia ($p\text{CO}_2$ 47.9 mmHg, $p\text{O}_2$ 34.4 mmHg) and inflammation (CRP 14.07 mg/l, WBC 13.5 K/ul). Tracheotomy was performed urgently. Included pharmacological treatment in the form of: Taromentin 1,2 g 2xd iv and Metronidazol 500 mg 3xd iv. The cystic lesion was punctured and decompressed by partial evacuation of fluid. A follow-up CT scan showed an air-filled laryngeal saccule of approx. $2.5 \times 2.5 \times 3$ cm on the right side, and on the left side in the same area a cavity filled with contents of thick fluid density around 30-40 jH with the presence of a gas bubble - probably a complication of a ventricular laryngeal cyst. The lesion in the CT scan was about 5 cm long.

The lesion partially indented into the cavity forward from the left hyoid bone, displaced the left geniohyoid muscle a bit to the front and moved the left submandibular gland, modelled and constricted the borderline area between the pharynx and larynx in segments, without obvious signs of the lesion's infiltration onto the described neighboring structures. With improvement, the patient was discharged home with a tracheotomy tube, with the recommendation to continue antibiotic therapy and remove the laryngocele in elective surgery after resolution of acute inflammation. After resolution of acute inflammation, after one month, the patient was again admitted to the local ward. After qualification, surgery was performed to remove the lesion under general anesthesia. A cystic lesion of 4.5×3 cm was dissected intraoperatively. The lesion penetrated through the thyrohyoid membrane into the larynx just above the left corner of the thyroid cartilage. The tumor was dissected and ligated in the most proximal area relative to the larynx. This was followed by Kleinsasser's directoscopy; no deviations were found in laryngeal imaging. Asymptomatic air-filled hernia on the opposite side was not removed. On the second day after surgery, laryngeal endoscopy revealed edema and left atrial hematoma. The lesions resolved after the use of antiedematous and anti-hemorrhagic drugs. On the last day of hospitalization, the patient underwent decannulation after prior confirmation of the correct laryngeal image in endoscopic examination. Histopathological examination revealed cystis lymphoepithelialis. The patient remains under constant care of the Laryngological Clinic and does not report any complaints regarding ENT organs.

DISCUSSION

Symptomatic laryngocele occurs with a frequency of 1 case per 2.5 million people. More men than women are affected (5:1). It is most often diagnosed in the 5th-6th decade of life. 2/3 cases of hernias are unilateral [9]. In most cases, it is asymptomatic and is accidentally detected in imaging studies. It most frequently manifests in the form of mild, minor ailments. About 8% of patients with laryngocele or laryngomucocele develop superinfection and laryngopyocele. It is associated with a sudden enlargement of the lesion on the neck or larynx, pain, dysphagia, hoarseness or sudden breathlessness [5, 9]. Complications of infected laryngocele include its intralaryngeal rupture with aspiration of purulent matter to the lower respiratory tract and further infection [4]. The method of choice is surgery. Asymptomatic air-filled laryngocele does not require treatment. In the case of symptomatic laryngocele or internal laryngomucocele, access via directoscopy and endoscopic treatment is recommended. Depending on different sources, hernia can be removed via a classical method or with a CO₂

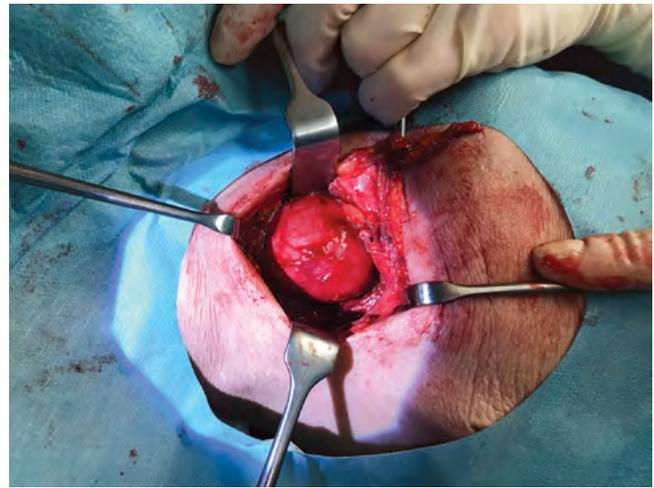


Fig. 4. Left laryngomucocele during the surgical removal.

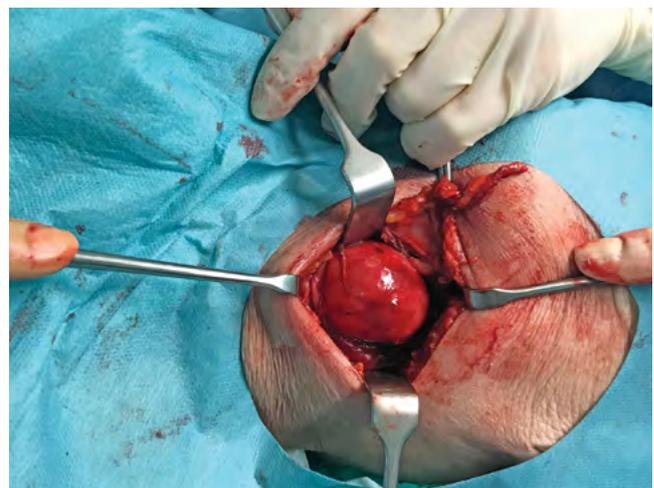


Fig. 5. Intraoperative view of mixed laryngocele removal on the left side.

laser [6, 7]. Fraser et al. described the method for internal treatment of laryngopyocele using laryngeal microdebrider and avoiding tracheostomy [10]. In the case of large mixed lesions - external access or double access is recommended - external through the neck and endoscopic [4, 11, 12].

The literature also describes coexistence of laryngocele with other diseases - most often squamous cell carcinoma, as well as laryngeal amyloidosis. Coexistence mechanisms consists in disruption of free air flow through the glottis and vestibular larynx due to the appearance of an obstacle in the form of a pathological tumor mass, which narrows the larynx lumen and increases pressure of flowing air; this condition promotes development of laryngocele [9, 13, 15]. Differential diagnosis should consider neoplastic lesions, hemangiomas, neuromas, lateral cysts of the neck or paragangliomas [16].

CONCLUSIONS

Even though severe laryngeal dyspnea is rarely associated with laryngocele, differential diagnosis should also consi-

der this disease among the possible causes of upper airway obstruction. Diagnostic imaging in the form of computed tomography comprises the basic examination necessary to make a diagnosis.

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