Case Report

Incidental discovery of multiple tracheal diverticula✩

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ARTICLE INFO

Article history:
Received 12 November 2020
Revised 19 November 2020
Accepted 19 November 2020

Keywords:
Tracheal diverticulum
Computed tomography
Chronic obstructive pulmonary disease

ABSTRACT

Tracheal diverticulum is observed in 1%-4% of the population, however, multiple tracheal diverticula are a rare occurrence. In this paper, we present a 75-year-old male, who was referred to a computed tomography-scan of the neck, chest, abdomen, and pelvis because of an unintended weight loss, fatigue, and a smoking history of 60 pack-years. A definitive cause for the symptoms was not found, however as an incidental finding, the patient was diagnosed with multiple tracheal diverticula along the back wall of trachea and left main bronchus. Despite the rare occurrence, it is important to recognize multiple tracheal diverticula in the diagnostic process, because of the possibility of either removing the diverticula or initiating prophylactic actions to prevent complications such as empyema and pneumomediastinum.

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Introduction

Tracheal diverticulum, also known as a tracheocele or tracheal air cyst, is an air filled outpouching of the tracheal wall. They are found in 1%-4% of the population, equally likely among males and females [1]. Multiple tracheal diverticula are a rare occurrence. Our paper describes a clinical case with incidental discovery of multiple tracheal diverticula. It is important to recognizing them in the diagnostic process as well as in the treatment strategy to minimize the risk of complications.

Case summary

A 75-year-old male was referred to the diagnostic unit with an unintended weight loss of 10 kg and general fatigue. He had a history of chronic cough and a smoking history of 60 pack-years and had previously been admitted to the hospital with pneumonia, but otherwise the medical history was unremarkable. The patient was referred for a computed tomography-scan of the neck, chest, abdomen, and pelvis to search for underlying malignant disease. The computed tomography-scan revealed no sign of malignant disease, but multiple tracheal
diverticula (>15) and signs of emphysema and chronic bronchiolitis (Figure 1 and 3). The diverticula were located along the posterior and right lateral trachea wall and along the left main bronchus. Some of them demonstrated clear communication with trachea, and the largest diverticulum measured 2.1 × 1.3 × 1.5 cm in diameter. There were no pleural effusions or enlarged lymph nodes in the thorax. The neck, abdomen, and pelvis were unremarkable except a cyst in the right kidney classified as a Bosniak IIIF renal cyst. No ascites or lymphadenitis. A definitive cause for the patient’s weight loss and fatigue was not found.

Discussion

Tracheal diverticula may be either congenital or acquired. Congenital diverticula originate from a defect in the endodermal differentiation in the development of the tracheal cartilage during the sixth week of fetal life [1]. Congenital diverticula contain all the layers of the tracheal wall and are typically filled with mucus. Acquired diverticula can appear on all levels and usually only consist of respiratory epithelia as they are the result of mucosal herniation. The majority of them are located at the posterolateral part of trachea at level Th1-Th3 on the right side, likely because this area is unprotected, while the left side of trachea at this level is protected by the aortic arch and esophagus [2]. Acquired tracheal diverticula can be the result of prolonged high intraluminal pressure, tracheomalacia or iatrogenic trauma, for example, after surgery. The first mentioned mechanism is likely combined with weakened muscles in the wall of trachea as a result of repeated respiratory infections [1]. Acquired tracheal diverticula represent 98% [3] of all and can be solitary or multiple. Differential diagnoses of tracheal diverticula include laryngocele, pharyngocele, Zenker’s diverticulum, and lung bullae [1].

Multiple tracheal diverticula are a rare finding and have been described in patients with cystic fibrosis [4] or Mounier-Kuhn disease, which is characterized by expansion of trachea because of expansion and atrophy of the elastic tissue [5]. Mounier-Kuhn disease is also known as tracheobronchomegaly and a diagnosis is made when the transverse coronal diameter of trachea, right bronchus and left bronchi exceed 3.0, 2.4 and 2.3 cm, respectively [6]. For the patient in this report those measurements were 2.8, 2.3 and 2.2 cm, respectively; therefore, by definition the patient did not have Mounier-Kuhn...
disease at the time of the scan, although the measurements came rather close (Figure 2).

Tracheal diverticula are often asymptomatic. When symptomatic, chronic cough, dyspnea, stridor, and recurrent airway infections may be seen. Dysphagia, neck pain, hemoptyis, and dysphonia because of direct pressure on the recurrent laryngeal nerve have also been described. Infected diverticula can lead to paratracheal abscesses, which can rupture and lead to empyema [1]. The condition can also lead to complications associated with intubation, where perforation can cause pneumomediastinum.

Treatment is not required among asymptomatic patients. Symptomatic younger patients without comorbidities can be treated with surgical resection or endoscopic cauterezation with laser or electrocoagulation. For older patients, possibly with comorbidity, conservative treatment is chosen with antibiotics, mucolytic, and physiotherapy [1].

The patient presented here was after the initial scan referred to lung specialists for follow-up and treatment. Even though most tracheal diverticula are asymptomatic, the patient in this report is in high risk of developing complications because of the extensive diverticula formation. To minimize the risk of this, the patient will require future control and procedural awareness to avoid the development of complicated infections, pneumomediastinum related to intubation and paralysis of the recurrent laryngeal nerve. Because of the high age of the patient a conservative strategy is most likely to be chosen.

Conclusion

Despite the rare occurrence of multiple tracheal diverticula, recognizing them in the diagnostic process, as well as in the treatment strategy is important, to minimize the risk of complications.

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