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A Case Study of Tracheal Diverticulum with Persistent Dysphagia and Hoarseness

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Abstract

Tracheal diverticulum (DV)

is a type of paratracheal air cyst (PTAC) that is often asymptomatic and usually detected incidentally by imaging methods. Tracheal DV are divided into two subgroups: congenital and acquired. Dysphagia, odynophagia, neck pain, hoarseness, hemoptysis, choking, and recurrent episodes of hiccups and burping can also be seen in symptomatic patients. Thin-section multidetector computed tomography (MDCT) is useful for diagnosis of tracheal diverticulum. The relationship between DV and tracheal lumen can be demonstrated by axial, coronal, and sagittal reformat multiplanar images. Bronchoscopy can also be used in diagnosis for tracheal DV. However, the connection between DV and tracheal lumen cannot be shown easily with bronchoscopy. Conservative treatment is the preferred treatment in asymptomatic patients. Surgical or conservative treatment can be performed for symptomatic patients, depending on patient age and physical condition.

Keywords: Tracheal Diverticulum; Dysphagia; Odynophagia; PTAC

Introduction

Classification

- Congenital tracheal DV: Is located 4 - 5 cm below the vocal cords or just above the carina; it is often located in the right paratracheal area. Also, it is smaller that of acquired DV, and it communicates with a small tract to the tracheal lumen.
- Congenital tracheal DV arises from a defect in endodermal differentiation during development of the membranous posterior tracheal wall or from a defect in the development of the tracheal cartilage during the sixth week of fetal life. Congenital tracheal DV affects the entire anatomy (respiratory epithelium, smooth muscle, and cartilage) of the trachea, and it is often filled with mucus. It is rarely associated with other congenital malformations, such as tracheoesophageal fistula.
- Acquired tracheal DV: Can occur at any level, and it only includes respiratory epithelium. It does not affect the smooth muscle or the cartilage [1]. It is frequently located in the posterolateral area at the level of the thoracic inlet between the extrathoracic and intrathoracic area, Acquired tracheal DV can be single or multiple. Multiple acquired tracheal DV is the hallmark of tracheobronchomegaly or Mounier- Kuhn disease.

Clinical Presentation

Acquired and congenital DVs are often asymptomatic. Chronic cough, dyspnea, stridor, or recurrent tracheobronchitis may be seen in symptomatic patients.

Dysphagia, odynophagia, neck pain, hoarseness, hemoptysis, choking, recurrent episodes of hiccups, and/or burping may also be seen. Tracheal DV can also cause dysphonia due to recurrent paral-

ysis resulting from direct compression of the DV. Infected tracheal DV may lead to paratracheal abscess.

Diagnosis

Multidetector computed tomography (MDCT) is the best imaging method to demonstrate tracheal DV. It is useful for evaluating the localization, size, contour, and wall thickness of tracheal DV. Characteristic MDCT findings of tracheal DV include a thin-walled air sac at the paratracheal area with or without communication to the tracheal lumen.

Figure 1: Contrast-enhanced multidetector computed tomography (MDCT), 1 mm thickness.
(A) Axial images of the chest showing air-filled tracheal diverticulum (DV) located at the right posterior paratracheal area (arrow) adjacent to the esophageal lumen (arrowhead) in the mediastinal window. There is no visible communicating channel between the DV and the tracheal lumen; (B) coronal and (C) sagittal reformatted images of the chest show a lobulated multiseptated air-filled tracheal DV (arrow) located at the paratracheal area in the parankim window. In addition, peribronchial wall thickening and mild emphysematous changes are observed in the parenchymal window.

Bronchoscopy can be used for diagnosis of tracheal DV; however, this is an invasive procedure. In addition, tracheal DV with a very narrow opening or those joined to the trachea by only a fibrous tract may not be revealed by bronchoscopy.

Treatment

Treatment is not necessary in asymptomatic patients. The age of the patient, the clinical presentation, and the presence of comorbidities should be taken into account when choosing a treatment approach in symptomatic patients. Surgical resection is often the treatment of choice for young, symptomatic patients. Surgical resection can be performed with the lateral cervical approach without the need for thoracotomy. In addition, endoscopic cauterization with laser or electrocoagulation can be used to treat symptomatic patients. However, conservative treatment can be performed in older patients. Conservative management (antibiotics, mucolytic agents, and physiotherapy) may also be applied for these patients.

Patients with acquired tracheal DV cannot always benefit from surgical resection. Prevention of the infection of diverticulum is the optimum choice in patients with multiple and wide-based acquired tracheal DV. Surgical resection is needed for congenital tracheal DV due to the long-term accumulated mucous in the lesion, which could be a source of infection. Surgical resection should be performed carefully in these patients due to the risk of injury of the laryngeal nerve and the esophagus [2-10].

Emergency intubation and surgical drainage is indicated in patients with paratracheal abscess who present with respiratory distress.

Conclusion

Tracheal DV is a type of PTAC that is usually discovered incidentally on thorax MDCT. The connection between the trachea and DV is not always shown by imaging methods and bronchoscopy. There are two different types of tracheal DV: congenital and acquired. The differential diagnosis of congenital and acquired tracheal DV is important for treatment. Surgical resection is needed for congenital tracheal DV due to the long-term accumulated mucous in the lesion, which could be a source of infection.

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