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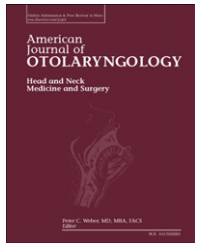

Tracheal diverticulum: A case report and literature review☆

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ABSTRACT

Purpose: Tracheal diverticulum (TD) is a rare, nonspecific symptom that is commonly associated with other malformations in clinical presentation and appearance on imaging. The case presented and the literature review performed highlight the importance of combining 3 D reconstruction technology and computerized Tomography (CT) results to better characterize TD on the list of differential diagnoses of patients.

Methods: The case described is of a 44-year-old male with a 1-year history of repeatedly coughing with white phlegm. Computerized tomography and three dimension reconstruction technology were employed to diagnose tracheal abnormalities. The patient underwent surgical resection of the tracheal diverticulum. Reexamination of the neck, chest, trachea and lungs of the patient was performed with CT scan post operation.

Results: Chest CT confirmed the presence of the air cavity lesion behind the neck segment and may be the trachea cysts. Bronchoscope examination was all normal. Furthermore, HRCT scan and the tracheal reconstruction were performed (as shown in Fig. 1), which show cystic cavity lesion was on right rear trachea and a tiny tha was connected the tracheal posterior wall. Post-operation, reexamination showed that the neck, chest CT, trachea and lungs had no detectable abnormity.

Conclusion: Diagnostic techniques such as HRCT and 3D reconstruction technology may help to diagnose the tracheal diverticulum timely and accurately. Resection of the diverticulum is the proper surgery, but only for symptomatic congenital diverticulum; therefore preoperative definite classification is important (acquired or congenital diverticulum).

1. Introduction

Tracheal diverticulum is a benign entity characterized by single or multiple invaginations of the tracheal wall. Tracheal diverticulum resembles laryngeal diverticulum, which is a more common disorder and may share the same pathogenic mechanism [1]. Tracheal diverticulum was first described by Rokitansky in 1838 [2], with few cases reported since. The largest series of 64 cases was reported by Goo et al. [3]. The overall prevalence is about 1% according to an autopsy series by MacKinnon [4], who found 8 cases in 867 routine serial autopsies, and 0.3% in children over 10 years of age according to fiberoptic bronchoscope studies [5], although it is rarely reported in clinical practice.

In addition to detecting the diverticulum, the diagnosis of this rare entity is made by CT scan of trachea (preferably Spiral/Helical CT) and re-construction in varying angles in coronal plane to visualize communication with tracheal wall.

☆ Conflicts of interest: All authors declare that they have no conflicts of interest.

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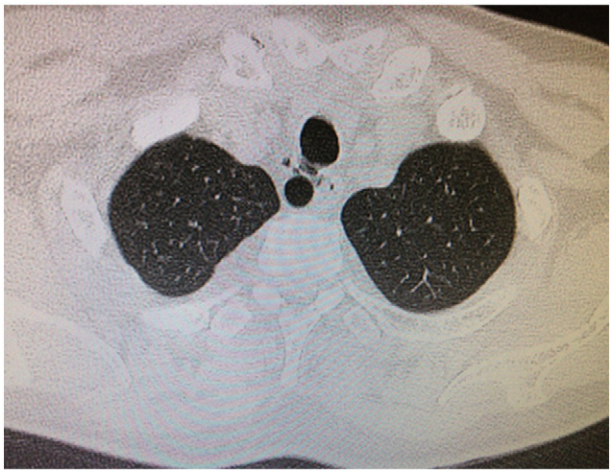

Fig. 1 – Helicoidal CT, 3-mm axial slice.Air image of ovoid morphology which is in intimate contact with the right tracheal wall.

Computerized tomography (CT) provides information concerning the location, origin, and size of the lesion, thus helping to distinguish between congenital and acquired lesions depending on the presence or absence of cartilage and the size of the neck of the diverticulum [6]. The development of new techniques such as three-dimensional reconstruction may be beneficial in the future for the morphologic diagnosis of this entity. There are also reports confirming the diagnosis of an unsuspected tracheal diverticulum at surgery or autopsy [7].

Treatment options include surgical resection, which can be performed via a lateral cervical approach without the need for thoracotomy, endoscopic cauterization with laser or electrocoagulation, and conservative management (antibiotics, mucolytic agents and physiotherapy). Excellent results have been reported after surgical excision. The option depends on the patient's physical state, age, and symptoms, with conservative management being more recommended for elderly patients, reserving surgery for the younger cases [8,9].

2. Case report

The patient has given his informed consent prior to his inclusion in the study, and the studies have been approved by Renji hospital, School of medicine, Shanghai Jiaotong University Ethics Committee and performed in accordance with the ethical standards.

The case described is of a 44-year-old male with a 1-year history of repeatedly coughing with white phlegm. There were no fever, no yellow purulent sputum and no blood in phlegm in the course. The patient previously took drugs such as antibiotics, mucosolvan, and licorice mixture, yet no symptom significantly improved. The patient was healthy and denied cough for a long time and smoking history. Physical examination: the neck without tumor or lymph node enlargement, breath sounds crude in double lung, no rale and no cardiac auscultation difference. Chest computerized Tomography (CT) confirmed the presence of the air cavity lesion behind the neck segment and may be the trachea cysts. Bronchoscope examination was all normal. Furthermore, HRCT scan and the tracheal reconstruction were performed (as shown in Fig. 1), which showed cystic cavity lesion was on right rear trachea and a tiny tha was connected the trachea posterior wall. Hospital diagnosis: tracheal diverticulum.

3. Course of treatment

Preoperative preparation and then performed the tracheal diverticulum resection. After general anesthesia in a supine position with head back, indwelling gastric tube, layer-by-layer cut cervical and root collar incision, exposed trachea, carefully detected the abnormality at the right side of the trachea, and then the laryngeal recurrent nerve on the right side was freed out with a rubber band pulling open. After careful, a pouch lesion was identified behind the tracheaesophageal groove of trachea, appears void status with tiny tha connected with trachea membrane. A complete resection of the pouch lesion was performed and sutured with absorbable thread through adjoining neighbor trachea membrane. In addition, there was a nodular lesion in the upper part of the diverticulum, the intraoperative frozen pathological examination after resection showed chronic lymphadenitis. After the wound was checked with no bleeding and the esophagus with no damage, the incision was closed step by step. The final pathological report: tracheal mucosa tissue and smooth muscle tissue appeared in the wall of the cyst. The final diagnosis: congenital tracheal diverticulum. The patient went out of hospital four days after operation. Six-month follow-up after surgery displayed no symptoms of cough and expectoration. Reexamination showed that the neck, chest CT, trachea and lungs had no detectable abnormity (as shown in Fig. 2).

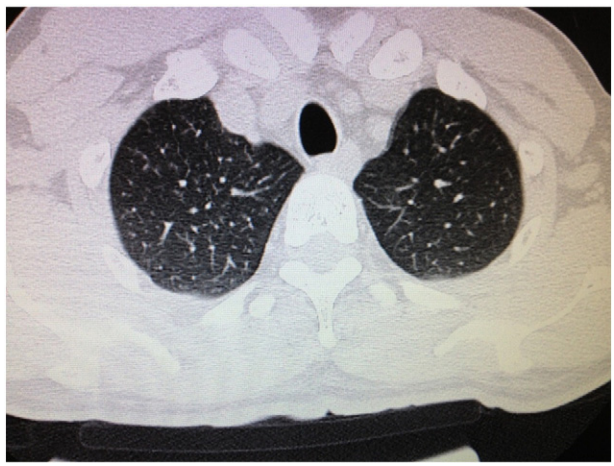

Fig. 2 – Helicoidal CT, 3-mm axial slice at six-month follow-up after surgery.Reexamination showed that the neck, chest CT, trachea and lungs were normal.