An Accidental Discovery of Tracheobronchomegaly: a Case Report

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Abstract

Tracheobronchomegaly is a rare disease with congenital abnormal change in respiratory tract; its image features are also very special. In this case, we described a 57-year-old male with cough, expectoration, chest pain, and dyspnea. In our institution, the result of chest CT scan is highly extraordinary, which showed obvious dilation of the trachea and main bronchi, emphysema, and a number of pulmonary bullae, and there was a big bulla with air-fluid level on the lower lobe of the right lung. Fortunately, after wedge resection for the big bulla on the lower lobe of right lung under video-assisted thoracoscopic surgery, this patient's symptoms were significantly relieved. The clinical manifestations of tracheobronchomegaly lack specificity; this disease has freakish image features. At present, there are no effective treatments for tracheobronchomegaly, which just was an accidental discovery in this patient; we just mainly take surgical measures to treat the big bulla for relieving symptoms.

Keywords Tracheobronchomegaly (TBM) · Mounier-Kuhn syndrome · Video-assisted thoracoscopic surgery (VATS) · Case report

Case report

A 57-year-old male patient presented to our hospital with a 20-day history of cough, expectoration, chest pain, and dyspnea, with blood presenting in the sputa. Prior to admission at

our hospital, he had been given treatments at other hospital, such as antibiotic administration, but there were little improvements. This patient had a 30-year history of smoking. His vital signs were stable but 86% oxygen saturation without oxygen inhalation. Chest physical examination revealed tympany, and hyperresonance was heard on the left and right lower lung fields, respectively; the breath sounds of both lower lung were slightly weakened, and there were no moist rales and dry rales. The plain chest radiograph showed dilation of the trachea and pulmonary inflammation. Contrast-enhanced chest computerized tomography (CT) scan showed dilation of the trachea and main bronchi: the transversal diameter and sagittal diameter of the trachea were 33 mm and 37 mm, respectively; the diameter of the left-main bronchus and right-main bronchus were 27 mm and 25 mm; respectively; emphysema and a number of pulmonary bullae could be bilaterally observed on the lungs, and there was a big bulla with air-fluid level on the lower lobe of the right lung (Fig. 1).

A surgical therapy was given to the patient. Except that a large tube was used for intubation, intraoperative ventilation was normal, and no anesthesia accidents occurred. We intraoperatively found a big bulla in the right lung under video-assisted thoracoscopic surgery (VATS), and then we performed wedge resection for it with linear cutting stapler. Postoperative pathological examination of the resected specimen indicated bulla and no malignant signs (Fig. 2). We

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Fig. 1 Plain chest radiograph and enhanced CT before surgery. **a** Plain chest radiograph showing dilation of the trachea and pulmonary inflammation. **b** Coronal reconstruction. **c–d** Dilation of the trachea and

main bronchi and multiple diverticula. **e–f** A big bulla with air-fluid level on the lower lobe of the right lung, air-fluid levels and pulmonary bullae are visible; the CT value is 14–28HU

repeated chest CT scan of the patient after surgery (Fig. 3). The patient subsequently showed successful recovery and discharged after treatment without any complications. The

final diagnosis of this patient was tracheobronchomegaly (TBM), complicated multiple pulmonary bullae on both sides, and emphysema.

Fig. 2 Pathological photomicrograph, HE staining. **a** In low power, 10 × 10 magnification. **b** In high power, 10 × 40 magnification

Fig. 3 Chest CT after surgery. **a** Dilation of the trachea and multiple diverticula. **b** Slight atelectasis and encapsulated effusion are visible

Discussion

The etiology of TBM is not clear, and it may be a connective tissue-related disease or an autosomal recessive genetic disease, but most cases had not been found; therefore, the etiology theory of TBM requires further study [1]. In TBM patients, the respiratory tract is softened due to congenital dysplasia of smooth muscle and elastic fiber in the trachea and main bronchi, which affects the movement of cilia and sputum discharge, resulting in repeated infections due to the accumulation of pathogens and foreign bodies, eventually leading to bronchiectasis, emphysema, bullae, and other conditions [2–4]. The clinical manifestations of TBM lack specificity; furthermore, cough, expectoration, and progressive dyspnea are common symptoms; in addition, some patients could be asymptomatic [5].

Chest CT, which plays an important role in the diagnosis of TBM, indicates the following in patients with this condition: ① obvious dilation of the trachea and main bronchi; ② thinning and softening of the tracheal walls and their expansion to form diverticula; and ③ confinement of lesions mainly to the secondary bronchi, while the boundary between the dilated trachea, main bronchi, and the surrounding tissues remains clear [2, 6, 7]. According to the diagnostic criterion formulated by Menon [1], in men, when the transversal diameter and sagittal diameter of the trachea are larger than 25 mm and 27 mm, respectively, and the diameter of the left-main bronchus and right-main bronchus are larger than 18.4 mm and 21 mm, respectively, and in women, when the transversal diameter and sagittal diameter of the trachea are larger than 21 mm and 23 mm, respectively, and the diameter of left-main bronchus and right-main bronchus are larger than 17.4 mm and 19.8 mm respectively, the possibility of TBM should be considered. In this case, the transversal diameter and sagittal

diameter of the trachea were 33 mm and 37 mm, respectively, and the diameter of the left-main bronchus and right-main bronchus were 27 mm and 25 mm, respectively, which met the criteria defined by Menon.

No effective treatments for TBM are available, patients are advised to stop smoking, and asymptomatic patients do not require treatment. When patients present with complications, treatments such as nebulizer inhalation, sputum excretion, and antibiotics may be prescribed [1, 2]. In recurrent cases, cauterizing the tracheal mucous membrane under the endoscope or interventional placement of Y-shaped metallic stents may reduce the risk of tracheal collapse; lung transplantation may be an effective measure for end-stage patients [8]. The patient in the present study had cough, expectoration, and chest pain for just 20 days; in addition, there have been few similar symptoms in the past decades; so we considered that he belonged to that kind of TBM patients without obvious symptom, current symptoms that affected his quality of life mainly originated from the infected bulla, and the patient was not willing to deal with TBM at the same time; therefore, we decided to perform wedge resection for the infected bulla under VATS. With respect to the diagnosis of TBM, considering that the patient had not experienced repeated attacks to date, no specific treatments were performed.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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