Tracheal Bronchus: Case Report

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Abstract- A tracheal bronchus is a congenital anomaly that is often asymptomatic but can be associated with a respiratory infection and chest pain. It is more common in men and the right lung and is seen between the carina and the cricoid cartilage. If it is asymptomatic, it does not need treatment and may be associated with other disorders such as Down syndrome. It is often diagnosed accidentally in bronchoscopy and bronchography. The left tracheal bronchus is often associated with brain abnormalities. In this study, we report a 37-year-old man who was referred to a hospital with coronavirus disease, and CT scans revealed RT tracheal bronchus abnormalities.

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Introduction

In 1785, a person named Sandifort first discovered the anomaly (1). The tracheal bronchus is a congenital anomaly that can occur on either side of the trachea and is the result of extra growth of the trachea during the fetal period (2). Bronchoscopic and bronchographic studies show a prevalence of 0.1-2% for the right tracheal bronchus and 0.3-1% for the left tracheal bronchus (3). Reduction and selection theories are among the theories that describe the cause of tracheal bronchus. It has a prevalence of 0.1 to 5% (2). It often occurs 2 cm above the carina but it can also be up to 6 cm above Karina (4) this means that it can be located between the carina and the cricoid cartilage (5). It has 0.5 to 1 cm in diameter and 0.6 to 2 cm in length. It is more common in men than women (2). Tumors can grow in the tracheal bronchus, but it rarely occurs (6). This abnormality is normal for animals such as pigs and other ruminants, which is why it is also known as Suis bronchus (7).

It is often asymptomatic and is usually diagnosed randomly on bronchoscopy or bronchography to diagnose other problems (8). The newest method for examining tracheal bronchus is CT (6). This anomaly has been reported more than once in the last few years, which could be a result of the development of hospital equipment (2).

Case Report

In July 2020, a 37-year-old man was admitted to Besat Hospital in Sanandaj with shortness of breath. Preliminary examinations revealed that the patient did not follow any of the health protocols for the coronavirus. Initially, the hospital laboratory reported that the results of the patient laryngeal swab test of SARS-CoV-2 with the qualitative real-time reverse-transcriptase–polymerase-chain-reaction (RT-PCR) assay were positive. To investigate the causes of shortness of breath and the effects of this disease, a CT scan of the lung was performed, in which the following cases were reported by a radiologist. A series of cavitary nodular opacities are seen in the posterior margin of the right apical segment. Several small bullae were scattered in the left lung. The heart was normal in size and no space-absorbing side was observed in the mediastinum. The bronchi were open and the pleural space had a

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normal appearance, and no pathological lesion was observed in the thoracic region, but the RT tracheal bronchus is quite evident in the obtained images (Figures 1 and 2).

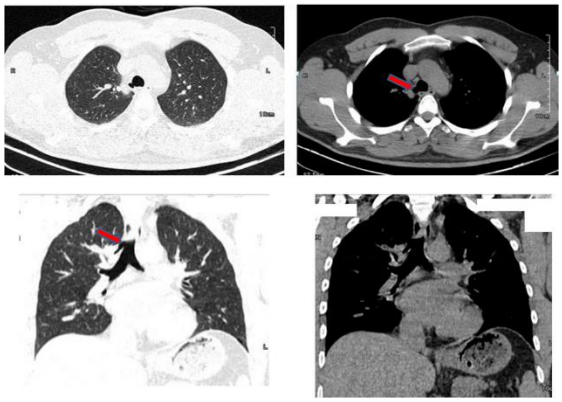

Figure 1. Axial and coronal non-contrast-enhanced image of computed tomography (CT) scan of the chest. The RT tracheal bronchus (red arrow)

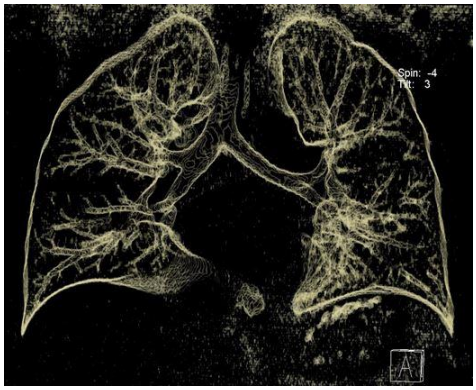

Figure 2. Three-dimensional reconstruction images of the lung, showing RT tracheal bronchus

Discussion

Respiratory tract divisions begin around four weeks of gestation, and in this week the trachea divides into two branches (9). The tracheobronchial diverticulum arises from the pharynx, which divides into two main branches of the bronchus at 4 weeks of gestation, and then smaller bronchi, bronchioles, and alveoli form, respectively (2). Observations have shown that the middle lobe of the right lung of infants has 18 sub-branches of the bronchus, and this rate is 23-25 sub-branches for the middle lobe in adults, so the process of bronchogenesis continues after birth (10).

The upper right lobe of the right lung naturally has three bronchi: the anterior, posterior, and apical. Tracheal bronchial malformations are classified into 2 categories. In the first classification, if the apical segment is supplied, it is of the apical type, and if the whole lobe is supplied, it will be of the lobar type. The second classification is based on the number of bronchi inserted into the right upper lobe, which mostly includes the displaced and Supernumerary (2). The displaced type is more common (5). In the displaced type, the arteries are usually normal and supplied by the pulmonary arteries and veins, and the bronchus of the right upper lobe becomes bifurcated (1). But supernumerary type blood vessels can be specific and under certain conditions can be supplied by the pulmonary and systemic arteries, and one or three normal extra-branching bronchi are observed (1). There is also a part of the right upper lobe called the azygous lobe that is aerated with several bronchi and has nothing to do with the tracheal bronchus (2).

Tracheal bronchus may in some cases be associated with pneumonia, cough, bronchiectasis, and chest pain, which may require medical intervention (6). Children with tracheal bronchitis may have infections respiratory (11). In some cases, it can be associated with cancers such as squamous cell carcinoma, tuberculosis, large cell cancer, and actinomycosis (6). The prevalence of congenital diseases is high in people with tracheal bronchitis. These abnormalities are often found in the respiratory, skeletal, muscle, and gastrointestinal systems (2). It can be associated with chromosomal abnormalities such as Down syndrome and congenital respiratory abnormalities such as tracheal stenosis (11) and skeletal abnormalities such as rib abnormalities (6). The left tracheal bronchus is often associated with brain abnormalities (12).

Treatment of tracheal bronchus depends on the symptoms (7). If there are no symptoms, disease management is sufficient, but if there are symptoms such as infection, it requires treatment such as removal of the deviated lobe and bronchus (1). These patients are sensitive to intubation and anesthesia and need special care (13). If intubation is performed and it blocks the tracheal bronchus, it can cause atelectasis and respiratory failure (14), and if the tracheal bronchus is accidentally intubated, it can cause pneumothorax (7).

A tracheal bronchus is a congenital anomaly that is often asymptomatic but can be associated with a respiratory infection and chest pain. It is often diagnosed accidentally in bronchoscopy and bronchography.

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References

1. Aoun NY, Velez E, Kenney LA, Trayner EE. Tracheal bronchus. Respir Med 2004;49:1056-8.
2. Barat M, Konrad HR. Tracheal bronchus. Am J Otolaryngol 1987;8:118-22.
3. Schweigert M, Dubecz A, Ofner D, Stein HJ. Tracheal bronchus associated with recurrent pneumonia. Ulster Med J 2013;82:94-6.
4. Siegel MJ, Shackelford GD, Francis RS, McAlister WH. Tracheal bronchus. Radiology 1979;130:353-5.
5. Ghaye B, Szapiro D, Fanchamps JM, Dondelinger RF. Congenital bronchial abnormalities revisited. Radiographics 2001;21:105-19.
6. Kuo CW, Lee YC, Perng RP. Tracheal bronchus associated with lung cancer: a case report. Chest 1999;116:1125-7.
7. Doolittle AM, Mair EA. Tracheal bronchus: classification, endoscopic analysis, and airway management. Otolaryngol Head Neck Surg 2002;126:240-3.
8. Atwell SW. Major anomalies of the tracheobronchial tree: with a list of the minor anomalies. Dis Chest 1967;52:611-5.
9. Hutchins GM, Haupt HM, Moore GW. A proposed mechanism for the early development of the human tracheobronchial tree. Anat Rec 1981;201:635-40.
10. Holinger PH, Zimmermann AA, Parchet VN, Johnston KC. A correlation of the embryonic development of the trachea and lungs with congenital malformations. In: S.Karger AG. Fortschritte der Hals-Nasen-Ohrenheilkunde. 3: Karger Publishers; 1956:1-39.
11. Kabra NS, Bowen JR, Allen H. "Porcine bronchus" diagnosed in neonatal period. Indian J Pediatr 2001;68:681-4.
12. Ritsema G. Ectopic right bronchus: indication for bronchography. AJR Am J Roentgenol 1983;140:671-4.
13. Ikeno S, Mitsuhata H, Saito K, Hirabayashi Y, Akazawa S, Kasuda H, et al. Airway management for patients with a tracheal bronchus. Br J Anaesth 1996;76:573-5.
14. O'Sullivan BP, Frassica JJ, Rayder SM. Tracheal bronchus: a cause of prolonged atelectasis in intubated children. Chest 1998;113:537-40.