Case Report

Rare Case of Tracheal Bronchus in a Patient Posted for Minimal Invasive Cardiac Surgery

Abstract

The tracheal bronchus is a rare congenital anomaly which occurs as a result of an additional tracheal outgrowth early in the embryonic life. It originates more commonly from the right wall of the trachea, above the carina. It is usually asymptomatic but may cause recurrent pneumonia, chronic bronchitis, or bronchiectasis. Here, we present the case of a 57-year-old lady posted for minimally invasive coronary surgery who was incidentally found to have an accessory bronchus during establishing one lung ventilation. The clinical implications of such a scenario is highlighted.

Keywords: *Bronchoscopy, one lung ventilation, tracheal bronchus*

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Introduction

The tracheal bronchus is a rare congenital anomaly which occurs as a result of an additional tracheal outgrowth early in the embryonic life. It originates more commonly from the right wall of the trachea, above the carina. It is usually asymptomatic but some people experience recurrent pneumonia, chronic bronchitis, or bronchiectasis, probably due to narrowing at the origin of the tracheal bronchus. The prevalence of the right tracheal bronchus is 0.1%–2% and that of the left tracheal bronchus is 0.3%–1%.[1,2]

Case History

A 57-year-old lady, a diagnosed case of diabetes mellitus (DM), hypertension (HTN), and chronic obstructive pulmonary disease (COPD), was admitted with complaints of angina at rest for 2 days. Coronary angiography revealed triple vessel coronary artery disease (CAD) with left ventricular systolic dysfunction (LVEF, 46%; generalized wall hypokinesia, PASP 50 mmHg). Rest of the preoperative investigations were normal. This patient was planned for minimally invasive coronary artery surgery (MICAS). After induction of anesthesia and endotracheal intubation, a bronchial blocker was inserted for lung isolation and selective one lung ventilation. During the fiberoptic-guided placement of the bronchial blocker and confirmation of its position inside the left main bronchus, it was incidentally found that there was an opening proximal to the primary carina. On further evaluation, it was realized that this was the right upper lobe bronchus originating from the right wall of the trachea.

It was ensured that the distal end of the endotracheal tube was above the proximal margin of the opening of this accessory bronchus. [Figure 1: bronchoscopic image]. Fortunately, we did not encounter any clinical difficulty in the anesthetic management of the patient as we had to isolate the left lung, which was done with the help of a bronchial blocker, and an endotracheal tube (ETT) was placed proximal to the origin of the tracheal bronchus. After the surgery was over and the patient was extubated and stabilized a computed tomography (CT) scan of the chest was done. The CT scans also revealed the tracheal bronchus [Figure 2: computed tomography images].

Discussion

The tracheal bronchus, which was first described by Sandifort in 1785, is an aberrant, accessory, or ectopic bronchial branch which originates from the right lateral wall of the trachea, which is more common in males. It occurs as a result of an additional tracheal outgrowth early in embryonic life, with an incidence which

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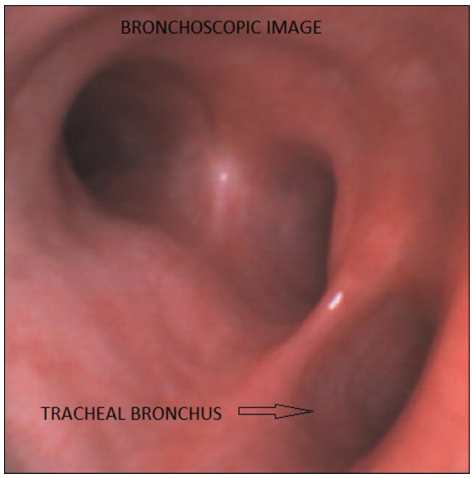

Figure 1: Bronchoscopic view

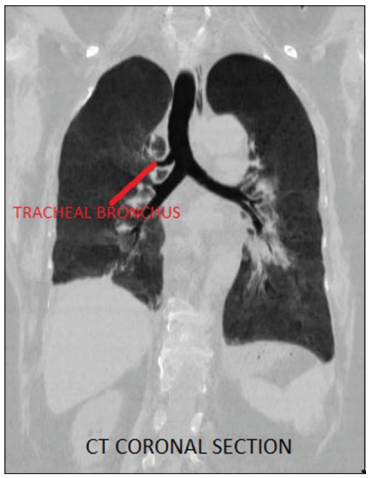

Figure 2: CT scan: thorax coronal section

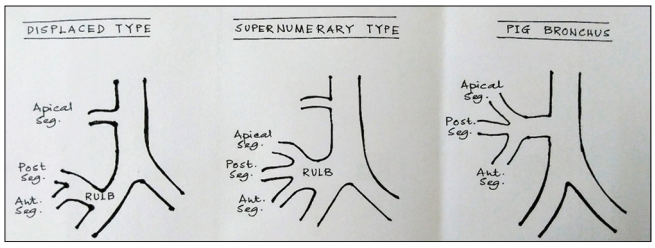

Figure 3: Types of tracheal bronchus

ranges from 0.1% to 5%.[1,2] The term "tracheal bronchus" is used to designate any bronchus which originates from the trachea above the level of the main carina [Figure 3]. The tracheal bronchus, which is also called as "Pig's bronchus," is a normal finding in sheep, swine, cattle, camels, goats, and giraffes, but it is a rare and usually incidental finding in humans [Figure 3]. It can develop from any point above the main carina, but occurs usually within the 2 cm range. Its diameter ranges from 0.5 cm to 1.0 cm and length ranges from 0.6 cm to 2.0 cm. It can be displaced or supernumerary, depending on the number of segmental bronchi of the anatomical right upper lobe bronchus.[3] If the anatomical right upper lobe bronchus bifurcates, the tracheal bronchus is defined as displaced, and if it trifurcates, it is defined as supernumerary. Most cases of the tracheal bronchus are asymptomatic and are detected only incidentally during bronchoscopy or radiologic examinations. The supernumerary bronchus is less common than the displaced bronchus and can coexist with the normal right upper lobe branching. The supernumerary tracheal bronchus aerates either the normal lung parenchyma, a cyst, or an accessory segment of the right upper lobe. The supernumerary lung tissue can be intra-lobar or extra-lobar, depending on whether it shares the pleura of the upper lobe. It can have its own vascular supply, which can be from the systemic or the pulmonary artery system [Figure 3].

A person with a tracheal bronchus may remain asymptomatic or there may be an association with recurrent episodes of pneumonia, chronic bronchitis, and bronchiectasis. Other comorbidities include a troubled intubation, intra-operative hypoxemia, and lung cancer in adults.[4] Other congenital anomalies such as a laryngeal web, rib and vertebral anomalies, tracheal stenosis, and congenital heart disease are occasionally associated with this condition.[5] In the case of recurrent pneumonia complicated by bronchiectasis, surgical resection of the aberrant bronchus as well as the lobe it supplies is the treatment of choice.[4]

Clinical implications and airway management in patients with tracheal bronchus

An ETT could obstruct an ectopic tracheal bronchus[6-8] or an ectopic tracheal bronchus could be intubated,[8,9] causing atelectasis, hypoxemia, or both. After apparently proper placement of an ETT, no air entry to any lung zone, especially the upper zones, could alert the anesthesiologist of the possibility of such an anatomical aberration.

Similarly, when a left-sided double-lumen tube (DLT) is used, the tracheal cuff may obstruct the tracheal bronchus. When the left lung is isolated and only the right lung is to be ventilated, this may cause severe hypoxemia as an additional lobe of the lung would not be available for gas exchange.

If a right DLT is used and the tracheal cuff is proximal to the opening of the tracheal bronchus opening, then efforts at right lung isolation will fail as the right upper lobe will be available for gas exchange via the tracheal lumen.

Similarly, when a bronchial blocker is used to isolate the right lung by placing the blocker inside the right main bronchus, the right upper will not be isolated. This possibly can only be achieved by the placement of an addition blocker or a Fogarty catheter.

Conclusion

The presence of a tracheal bronchus during airway management of a patient in the operating room or

intensive care unit may be a clinical surprise. Unexplained absent air entry to any lung zone after intubation and or lung isolation should raise a clinical suspicion of this anatomical entity.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Barat M, Konrad HR. Tracheal bronchus. Am J Otolaryngol 1987; 8:118-22.
2. Calvet P, Domenech B, Sans N, Giron J, Railhac JJ. The right tracheal bronchus. J Radiol 1997;78:135-9.
3. Freeman SJ, Harvey JE, Goddard PR. Demonstration of the supernumerary tracheal bronchus by computed tomographic scanning and magnetic resonance imaging. Thorax 1995;50:426-7.
4. Kim J, Park C, Kim H, Lee SK. Surgical resection of the lung cancer which originated in a tracheal bronchus. Ann Thorac Surg 1998;66:944-6.
5. McLaughlin FJ, Strieder DJ, Harris GBC, Vawter GP, Eraklis AJ. Tracheal bronchus: Association with respiratory morbidity in childhood. J Paediatr 1985;106:751-5.
6. Brodsky JB, Mark JBD. Bilateral upper lobe obstruction from a single double-lumen tube. Anesthesiology 1991;74:1163-4.
7. Tomoda M, Ueda W, Hasegawa T, Hirakawa M. Troubledendotracheal intubation: An adult case of anomalous trachealbronchus. Masui 1992; 41:984-7.
8. Pribble CG, Dean JM. An unusual cause of intraoperativehypoxemia. J Clin Anesth 1994;6:247-9.
9. Venkateswarlu T, Turner CJ, Carter JD, Morrow DH. The tracheal bronchus: An unusual airway problem. Anesth Analg 1976;55:746-7.