An incidental diagnosis of tracheal bronchus using computed tomography in the congenital heart disease patient

Sir,

We report a case of 40-days-old female infant, who was diagnosed with a mixed obstructive total anomalous pulmonary venous connection (TAPVC) and severe pulmonary artery hypertension (PAH), and who was incidentally detected to have a tracheal bronchus in the postoperative period following TAPVC repair.

The child was scheduled for TAPVC repair. After anesthesia induction, trachea was intubated with 4mm uncuffed endotracheal tube in the intraoperative period and was fixed at the right angle of mouth with the depth of insertion at 9.5 cm. The intraoperative period was uneventful and the patient was transferred to postoperative intensive care unit (ICU) with stable hemodynamic parameters and infusions of intravenous milrinone, sildenafil, vasopressin, and norepinephrine. In the immediate postoperative period, chest X-ray [Figure 1a] showed tip of endotracheal tube (ETT) at the first thoracic vertebra (T1) level. Hence, we planned to advance the ETT, so that its tip would be expected to reach the level of (T2-T4). However, when the ETT was advanced to a depth of 10.5 cm at the angle of the mouth, the repeat check chest X-ray [Figure 1b] revealed the right upper lobe collapse, although rest of the lung fields were expanded adequately.

Retrospectively, when we inspected the computed tomography (CT) image of the trachea and bronchi, we discovered that the child was having a tracheal bronchus. The right upper lobe bronchus was originating directly from the trachea about 1 cm above the carina, where the trachea divided into the right bronchus intermedius and left main bronchus [Figure 2]. The ETT was withdrawn and fixed again at 9.5 cm. The succeeding chest X-ray showed complete expansion of the right upper lobe [Figure 1c].

Reviewing the CT scan images could enable us to identify the tracheal bronchus, which otherwise would have been difficult to diagnose with X-ray and chest auscultation alone. The identification of tracheal bronchus remains vital in these subsets of patients, as any lung collapse often worsens the PAH.
Letters to Editor

The complex congenital heart conditions may be associated with tracheal bronchus, especially in patients with down syndrome and VACTERL anomalies.[1] Tracheal bronchus has been classified into three types based on the distance of its origin from the carina and the presence or absence of distal tracheal narrowing.[2]

Type 1: More than 2 cm from carina with distal tracheal narrowing.

Type 2: More than 2 cm from carina without distal tracheal narrowing.

Type 3: Less than 2 cm from carina without distal tracheal narrowing.

In our patient, it was type 3 tracheal bronchus, as it was originating barely 1 cm from the carina without any coexisting distal tracheal narrowing. Inadvertent placement of ETT distal to the origin of a tracheal bronchus may result in atelectasis,[3] lobar collapse, decreased oxygenation and ventilation and increase the risk of respiratory tract infections.[4,5] All these factors are independent risk factors for the development of PAH eventually resulting in increased requirements of pulmonary vasodilators and increased length of ICU and hospital stay. In our case, we could identify the tracheal bronchus on CT scan images immediately in the postoperative period and the ETT was adjusted at an appropriate depth such that all the lung fields could be ventilated.

The possible presence of a tracheal bronchus should always be kept in mind during airway management in patients with complex congenital heart diseases. Thoracic CT scan is an important tool for the detection of this anomaly, when chest auscultation and X-ray chest may have limitations in identifying the anomalous origin of the bronchus. Ruling out the presence of a tracheal bronchus should become a part of the routine protocol for the preoperative evaluation in complex congenital cardiac diseases.

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 anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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