



CASE SERIES

Tracheal Bronchus: Clinical Spectrum and Bronchoscopic Detection - A Case Series

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Abstract

Tracheal bronchus is an uncommon congenital anomaly of the tracheobronchial tree, usually detected incidentally. We report a case series of three adult patients in whom a right-sided tracheal bronchus was identified during fibre-optic bronchoscopy performed for varied clinical indications, including lung malignancy, tuberculosis, and hemoptysis. This series highlights the importance of recognising this anomaly during bronchoscopic and airway procedures.

Key Words

Tracheal Bronchus, Bronchus Suis, Pig Bronchus, Bronchoscopy, Congenital Airway Anomaly

Introduction

Tracheal bronchus is a rare congenital anomaly of the tracheobronchial tree, characterised by an aberrant bronchial origin directly from the trachea, most commonly arising from the right lateral wall. The reported prevalence in humans ranges from 0.1% to 2% on the right side and is lower on the left. Although frequently asymptomatic and detected incidentally on imaging or bronchoscopy, tracheal bronchus may have important clinical and procedural implications, particularly during bronchoscopy, endotracheal intubation, and airway interventions.^[1-4]

Anatomically, tracheal bronchus may present as a displaced bronchus supplying part of the upper lobe, or as a true or supernumerary bronchus arising directly from the trachea, sometimes supplying the entire upper lobe (bronchus suis or pig bronchus). While most cases remain clinically silent, associations with recurrent infections, hemoptysis, and coexistence with pulmonary malignancy or tuberculosis have been described.^[5-6]

We report a case series of three adult patients in whom a right-sided tracheal bronchus was identified during fibre-optic bronchoscopy performed for varied clinical

indications, including lung malignancy and pulmonary tuberculosis. This series highlights the diverse anatomical variants of tracheal bronchus, the limitations of imaging detection, and the importance of bronchoscopic recognition of this anomaly in routine clinical practice.

Case 1

A 44-year-old male with a history of smoking presented with cough, weight loss, and anorexia for one month, along with blood-tinged sputum for the preceding 15 days. Computed tomography (CT) of the chest revealed a heterogeneously enhancing mass lesion measuring approximately $81 \times 41 \times 88$ mm in the right lower lobe. A tracheal bronchus was also noted in CT image (Figure 1). Fibre-optic bronchoscopy demonstrated a right-sided tracheal bronchus that further divided into two openings (Figure 2). In this case, the tracheal bronchus represented a displaced bronchus, supplying the apical segment of the right upper lobe. Right main bronchus was divided in bronchus intermedius and right upper lobe bronchus with two subsegmental division seen. A nodular growth was visualised on the right main bronchus, partially occluding the lumen. Endobronchial biopsy of this growth revealed

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Manuscript Received: 28.01.2026; **Revision Accepted:** 18.04.2026;

Published Online First: 10th July, 2026.

Open Access at: <https://journal.jkscience.org>

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Cite this article as: Somani R, Sharma A, Mittal V, Rajawat GS, Bainara MK. Tracheal Bronchus: Clinical Spectrum and Bronchoscopic Detection - A Case Series. JK Science 2026;28(3):186-8.



Figure 1: Computed tomography (CT) of the Chest (axial cut, mediastinal window) showing right tracheal bronchus dividing in two subsegments.

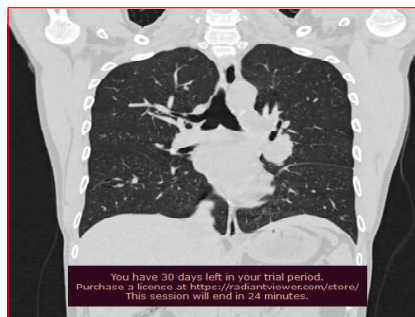


Figure 3: Computed tomography (CT) of the chest (coronal cut, lung window) showing right tracheal bronchus



Figure 2: Bronchoscopic image showing right tracheal bronchus at 4 o'clock position.

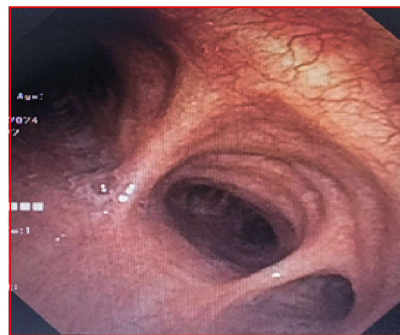


Figure 4: Bronchoscopic image showing right tracheal bronchus originating just prior to main carina.



Figure 5: Computed tomography (CT) of the chest (lung window) showing randomly distributed nodules



Figure 6: Bronchoscopic image showing small right tracheal bronchus originating less than 2cm prior to main carina. Image also shows main carina and right carina 1(RC1).

adenocarcinoma.

Case 2

A 55-year-old former smoker presented with left-sided chest pain and loss of weight for one month. CT of the thorax revealed a heterogeneous soft tissue mass measuring approximately 58×45 mm in the left hilar region involving the left main bronchus. Multiplanar coronal reconstruction images incidentally demonstrated a tracheal bronchus ("pig bronchus") (Fig. 3). Flexible bronchoscopy performed for biopsy of the mass lesion revealed an accessory bronchial orifice arising from the

right lateral tracheal wall just proximal to the main carina (Fig. 4). This anomalous bronchus supplied the right upper lobe with normal apical, posterior, and anterior segmental branching, consistent with a true tracheal bronchus (bronchus suis). Also, classified as anomalous tracheal bronchus. The right main bronchus functioned as the bronchus intermedius, further dividing into the middle and lower lobe bronchi. Biopsies taken from the growth present at lower end of left main bronchus confirmed the diagnosis of squamous cell carcinoma.

Case 3

A 52-year-old male smoker, employed as a stone worker, presented with progressive dyspnea on exertion for 5–6 months, dry cough for two months, and low-grade fever with weight loss and anorexia for approximately six weeks. CT of the thorax showed randomly distributed pulmonary nodules (Figure 5). Bronchoscopy was performed to evaluate for tuberculosis which revealed a small right-sided tracheal bronchus. Bronchoscope was unable to be negotiated in this opening. Remaining right bronchial tree had normal anatomical presence of upper, middle and lower lobe bronchus. Bronchioalveolar lavage was positive for *Mycobacterium tuberculosis*, confirming pulmonary tuberculosis. This case had a rudimentary accessory bronchus within less than 2 cm from carina. In this case chest CT films did not show tracheal bronchus in any provided sections and was incidentally found during video bronchoscopy.

Discussion

Tracheal bronchus is thought to arise from disturbances during embryological development of the bronchial tree, including abnormal migration of bronchial buds, reduction of a normally positioned bronchus, or local morphogenetic disruption.^[1-3] Based on anatomical characteristics, tracheal bronchus has been classified according to its distance from the carina and associated tracheal narrowing, as well as functionally into displaced, true (anomalous), or rudimentary types. In our series, all three major variants were observed: a displaced tracheal bronchus supplying the apical segment of the right upper lobe (Case 1), a true tracheal bronchus supplying the entire right upper lobe (Case 2), and a small rudimentary tracheal bronchus located within 2 cm of the carina (Case 3). This highlights the anatomical heterogeneity of this anomaly even within a small case series.

Computed tomography is generally considered the imaging modality of choice for identifying tracheal bronchus, allowing accurate delineation of its origin and course.^[5,7] However, in the present series, one case of supernumerary tracheal bronchus was not visualised on CT film and was detected only during bronchoscopy, underscoring the limitations of films and the continued importance of direct endoscopic evaluation.

Although tracheal bronchus is often an incidental finding, it has been associated with recurrent infections, hemoptysis, atelectasis, and impaired ventilation, particularly when the anomalous bronchus is narrow or obstructed.^[2,6] In our series, tracheal bronchus coexisted with lung malignancy in two cases and pulmonary

tuberculosis in one case. While a direct causal relationship cannot be established, awareness of such anatomical variants is essential to avoid diagnostic errors and misinterpretation of bronchoscopic findings.

From a procedural standpoint, failure to recognise a tracheal bronchus during bronchoscopy or airway management may result in incomplete examination, accidental obstruction during intubation, post-obstructive pneumonia, hypoxia, or pneumothorax.² Recognition of this anomaly is therefore particularly relevant for pulmonologists and anesthesiologists performing airway procedures.

Conclusion

Tracheal bronchus is an uncommon congenital airway anomaly that may be encountered incidentally during bronchoscopy in adults undergoing evaluation for diverse pulmonary conditions. Awareness and recognition of this anomaly during bronchoscopic evaluation are essential to ensure accurate diagnosis, avoid procedural complications, and optimise airway management, particularly in patients with coexisting pulmonary disease.

Financial Support and Sponsorship : Nil
Conflict of Interest: Nil

References

1. Ghaye B, Szapiro D, Fanchamps JM, Dondelinger RF. Congenital bronchial abnormalities revisited. *Radiographics*. 2001;21(1):105–119.
2. Conacher ID. Implications of a tracheal bronchus for adult anaesthetic practice. *Br J Anaesth*. 2000 Aug;85(2):317–20.
3. Doolittle AM, Mair EA. Tracheal bronchus: classification, endoscopic analysis, and airway management. *Otolaryngol Head Neck Surg*. 2002 Mar;126(3):240–3.
4. Sharma A, Rajawat GS, Gupta M. True Tracheal Bronchus. *J Assoc Physicians India*. 2025 Jul;73(7):103.
5. Lee EY, Boisselle PM, Cleveland RH. Multidetector CT evaluation of congenital lung anomalies. *Radiology*. 2008 Jun;247(3):632–48.
6. McLaughlin FJ, Strieder DJ, Harris GB, Vawter GP, Eraklis AJ. Tracheal bronchus: association with respiratory morbidity in childhood. *J Pediatr*. 1985 May;106(5):751–5.
7. Suzuki M, Matsui O, Kawashima H, Takemura A, Matsubara K, Hayashi N, et al. Radioanatomical study of a true tracheal bronchus using multidetector computed tomography. *Jpn J Radiol*. 2010 Apr;28(3):188–92.