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Staphylococcus haemolyticus Pneumonia in an Adolescent: A Case Report

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Case Report

Keywords: Staphylococcus haemolyticus, Pneumonia, Coagulase-negative staphylococci, Bronchial washing, Adolescent, Multidrug resistance

Posted Date: September 25th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10624383/v1

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Additional Declarations: No competing interests reported.

Abstract

Coagulase-negative staphylococci have conventionally been regarded as contaminants within clinical samples; however, their status as true pathogens is becoming increasingly well recognized in a proper clinical setting. We report a case of a 17-year-old male with fever, a productive cough, dyspnea, and pleuritic chest pain. Raised levels of inflammatory markers were detected during laboratory studies indicating the presence of inflammation or infection. His imaging results showed signs of consolidation in the left lower lobe. As he continued to show respiratory symptoms, bronchoscopy was done, which showed *Staphylococcus haemolyticus* in bronchial washings. Tuberculosis workup was negative. Correlating the clinical findings with radiological imaging and microbiologic results led to a diagnosis of pneumonia involving his left lower lobe. He received targeted antibiotic therapy along with other forms of supportive therapy, and no growth was detected in the subsequent culture report before he was discharged from the hospital. This case report highlights the potential role of *S. haemolyticus*, typically regarded as a contaminant, as a true respiratory pathogen in an immunocompetent adolescent.

Introduction

Coagulase negative staphylococci, including *Staphylococcus haemolyticus* among others, has always been considered human skin commensals, and any isolation of such strains from clinical samples would usually be dismissed as contamination [1,2]. More recent evidence, however, has pointed to an increased role played by CoNS as significant opportunistic pathogens, especially in immunocompromised individuals admitted to hospital facilities [2,7]. *Staphylococcus haemolyticus* an opportunistic pathogen in particular causes blood stream infections, as well as infection with foreign objects placed into body cavities, although it has been identified to affect the respiratory system as well [3].

The occurrence of clinically significant CoNS infections remains uncommon in otherwise healthy individuals, particularly in younger patients. It has been demonstrated that a significant number of cases which used to be thought of as contaminated cultures, indeed involved an actual infection in the respective host [7]. Furthermore, *S. haemolyticus* has shown its ability to resist multiple drugs, often with the involvement of mobile genetic elements [5]. Lastly, this bacterium demonstrates biofilm-forming capabilities [4].The incidence of respiratory infections caused by CoNS is not high in healthy subjects or even among young patients who have no signs of immune deficiency, and it may cause such cases to be overlooked [1].

In this case study, we present *Staphylococcus haemolyticus* pneumonia in a young patient, highlighting the importance of the case and the need for consideration of CoNS in the list of potential pathogens causing respiratory infection.

Case Presentation

A 17-year-old male was admitted with the chief complaints of fever that he found to be intermittent along with productive cough with sputum production. Other symptoms mentioned by the patient

included mild dyspnea, chest pain that become more pronounced during episodes of coughing. The patient on admission was hemodynamically stable. He was stable clinically with good sleeping pattern and bowel routine. On physical examination, the patient was conscious, alert, and oriented. The patient was also noted to have a deviated nasal septum (DNS) on clinical evaluation. On respiratory system examination, bilateral lower lobe crepitations were noted. No other significant abnormalities were noted on systemic examination.

Laboratory investigation showed hemoglobin level to be 14.3 g/dL, total leukocyte count 11.18 × 10^9/L with neutrophilia (80.8%), lymphocytes 15.5%, eosinophils 1.0%, monocytes 2.6%, and basophils 0.1%. Platelet count was 362 × 10^9/L. ESR was high at 84 mm/hr. The renal function profile was normal with serum creatinine level of 0.6 mg/dL and eGFR 147.81 mL/min/1.73 m^2. Liver function test results were within normal limits.

Considering the persistence of respiratory complaints, the patient was then subjected to bronchoscopy.Bronchoscopy demonstrated mucopurulent secretions involving the respiratory tract (Fig. 1–4), and bronchial washing confirmed the presence of infection in the same region.

Figure 1- 4: Bronchoscopic images demonstrate diffuse mucosal erythema with the presence of thick mucoid to mucopurulent secretions within the upper and lower respiratory tract.

Specimens from bronchial washing were collected and submitted for microbiological analysis, which included Gram stain, CBNAAT test for Mycobacterium tuberculosis, smear of acid-fast bacilli, fungal examination, and cytology. Test results for tuberculosis infection were negative. Cultures from bronchial washings grew coagulase-negative staphylococci, which were subsequently identified as *Staphylococcus haemolyticus*. The correlation of clinical presentation, imaging characteristics, and microbiological data supported the definitive diagnosis of pneumonia caused by *Staphylococcus haemolyticus* infection of the left lower lung lobe. The bronchial wash culture findings are summarized in Table 1.

Table 1
Bronchial Wash Culture and Sensitivity Report.

Parameter	**Result**
Specimen	Bronchial Wash
Smear Findings	Epithelial cells (++), polymorphonuclear leukocytes (+++), occasional Gram-positive cocci, occasional Gram-negative bacilli
Culture Result	Growth Present
Organism Isolated	*Staphylococcus haemolyticus* (Coagulase-negative *Staphylococcus* species)
Clinical Significance	Multidrug-resistant isolate susceptible only to selected agents

The antimicrobial susceptibility profile of the isolated *S. haemolyticus* is presented in Table 2.

Table 2
Antimicrobial Susceptibility Pattern of *Staphylococcus haemolyticus*

Antimicrobial Agent	**Susceptibility**
Amoxicillin/Clavulanic Acid	Resistant (R)
Cefotaxime	Resistant (R)
Ceftriaxone	Resistant (R)
Ciprofloxacin	Resistant (R)
Cotrimoxazole	Resistant (R)
Gentamicin	Resistant (R)
Levofloxacin	Resistant (R)
Clindamycin	Resistant (R)
Erythromycin	Resistant (R)
Ampicillin	Resistant (R)
Amikacin	Sensitive (S)
Linezolid	Sensitive (S)
Teicoplanin	Sensitive (S)
Vancomycin	Sensitive (S)

Antimicrobial therapy was tailored according to the culture, antimicrobial susceptibility profile, and resistance pattern identified from the isolate, while supportive care was continued throughout hospitalization. The patient showed progressive clinical recovery. A repeat culture performed before discharge demonstrated no microbial growth, and the patient was discharged in stable condition.

Discussion

Traditionally, CoNS, including *S. haemolyticus*, have been considered commensals of the skin and are often labeled as contaminants if isolated from clinical samples. Emerging evidence indicates that CoNS can be increasingly considered potential pathogens, especially in hospitalized patients and those predisposed due to underlying risk factors [1,2]. Among other species of CoNS, *S. haemolyticus* is becoming increasingly important due to its role in health care-related infections and high resistance potential [3]. Recently, several studies demonstrated that a large proportion of isolated CoNS strains may actually be associated true pathogens rather than incidental contaminants, emphasizing their clinical relevance.[7].

The current case provides an example of the true infection caused by S. haemolyticus due to isolation of the bacteria from bronchial washing, which is a relative sterile specimen from the lower respiratory tract, as well as other supportive evidence like symptoms and imaging showing consolidation of the left lower lobe. Compared to the sputum culture, the sample obtained via bronchoscopy cannot be contaminated by normal flora from the upper respiratory tract. Moreover, the patient responded to targeted antimicrobial treatment.

While cases of *S. haemolyticus* associated with bloodstream infection and device-associated infection have been commonly described, it remains rare to see *S. haemolyticus* infecting the respiratory system, especially in an immunologically sound adolescent population [1,3]. The possibility that the patient's deviated nasal septum (DNS) was an underlying cause for the abnormal airway dynamics and mucociliary clearance, which increased his susceptibility to lower respiratory tract infections, should not be ruled out. In any case, these local anatomic conditions might be instrumental in providing a pathway for the invasion of lower airways by colonizing microorganisms. Local factors in this patient, specifically a deviated nasal septum, might be a underlying factor in the development of abnormal airways dynamics leading to the patient's vulnerability to developing infection at the lower respiratory tract level. The presence of either preexisting or covert colonization of the upper respiratory tract may have been associated with the organism's migration to the lower respiratory tract.

Respiratory infections caused by *Staphylococcus haemolyticus* are rarely reported, with the organism being more commonly associated with bloodstream, catheter-related, and other healthcare-associated infections. Reports of microbiologically confirmed *S. haemolyticus* pneumonia, particularly in immunocompetent adolescents, remain limited. This case highlights the importance of considering *S. haemolyticus* as a potential pathogen rather than dismissing it as a contaminant when it is isolated from appropriately collected lower respiratory tract specimens in the presence of compatible clinical and radiological findings.[8]

The culture and sensitivity test performed yielded a clear-cut antibiotic sensitivity pattern, including both sensitive and insensitive antibiotics. This information provided evidence about the pathogenic nature of *Staphylococcus haemolyticus* in this patient and facilitated the choice of the right antibiotics. On the contrary, taking into account multidrug resistant possibilities of *Staphylococcus haemolyticus*, the treatment strategy was based on the results of cultures and antimicrobial susceptibility test.[6].

Conclusion

This case demonstrates that *S. haemolyticus*, although often regarded as a contaminant, can act as a true respiratory pathogen when isolated from appropriately collected lower respiratory tract specimens in the presence of compatible clinical and radiological findings. It also highlights the value of bronchoscopy and microbiological investigations in identifying uncommon causes of pneumonia and guiding targeted antimicrobial therapy. Careful interpretation of culture results in the appropriate clinical

context is essential to avoid overlooking clinically significant coagulase-negative staphylococcal infections.

Declarations

Ethics approval and consent to participate.

Ethical approval was not required for this single case report according to institutional policy.

Consent for publication

Written informed consent for publication of this case report and the accompanying clinical images was obtained from the patient's parent/legal guardian. A copy of the written consent is available for review by the Editor-in-Chief upon reasonable request.

Availability of data and materials

All data generated or analyzed during this study are included in this published article. Additional information is available from the corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

The authors received no specific funding for this work.

Authors' contributions

Mohammed Sha Alam MB managed the patient's clinical care, established the diagnosis, interpreted the clinical, radiological, and microbiological findings, and supervised the preparation of this case report. He critically reviewed the manuscript and provided valuable revisions before approving the final version.

Brilcy Maria PJ collected and organized the clinical data, reviewed the relevant literature, drafted the manuscript, prepared the tables and figures, and incorporated revisions following discussions with the co-author. She also assisted in preparing the manuscript for submission.

Both authors read and approved the final manuscript.

Acknowledgements

The authors thank the Department of Pulmonary Medicine and the Department of Microbiology for their support in the diagnosis and microbiological evaluation of this case.

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Figures

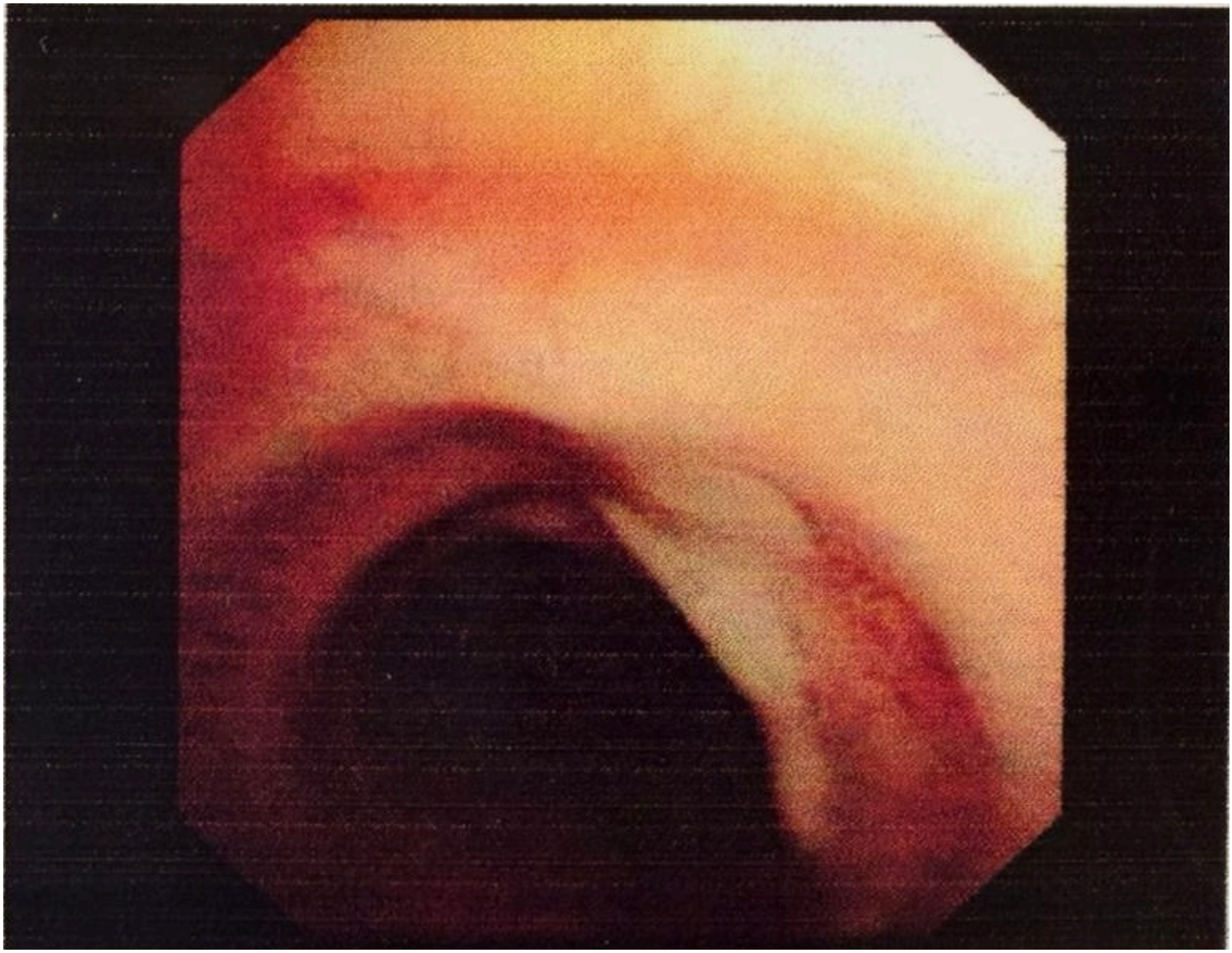


Figure 1

Shows the nasal passage with prominent thickmucoid secretions, correlating with upper respiratory tract involvement.

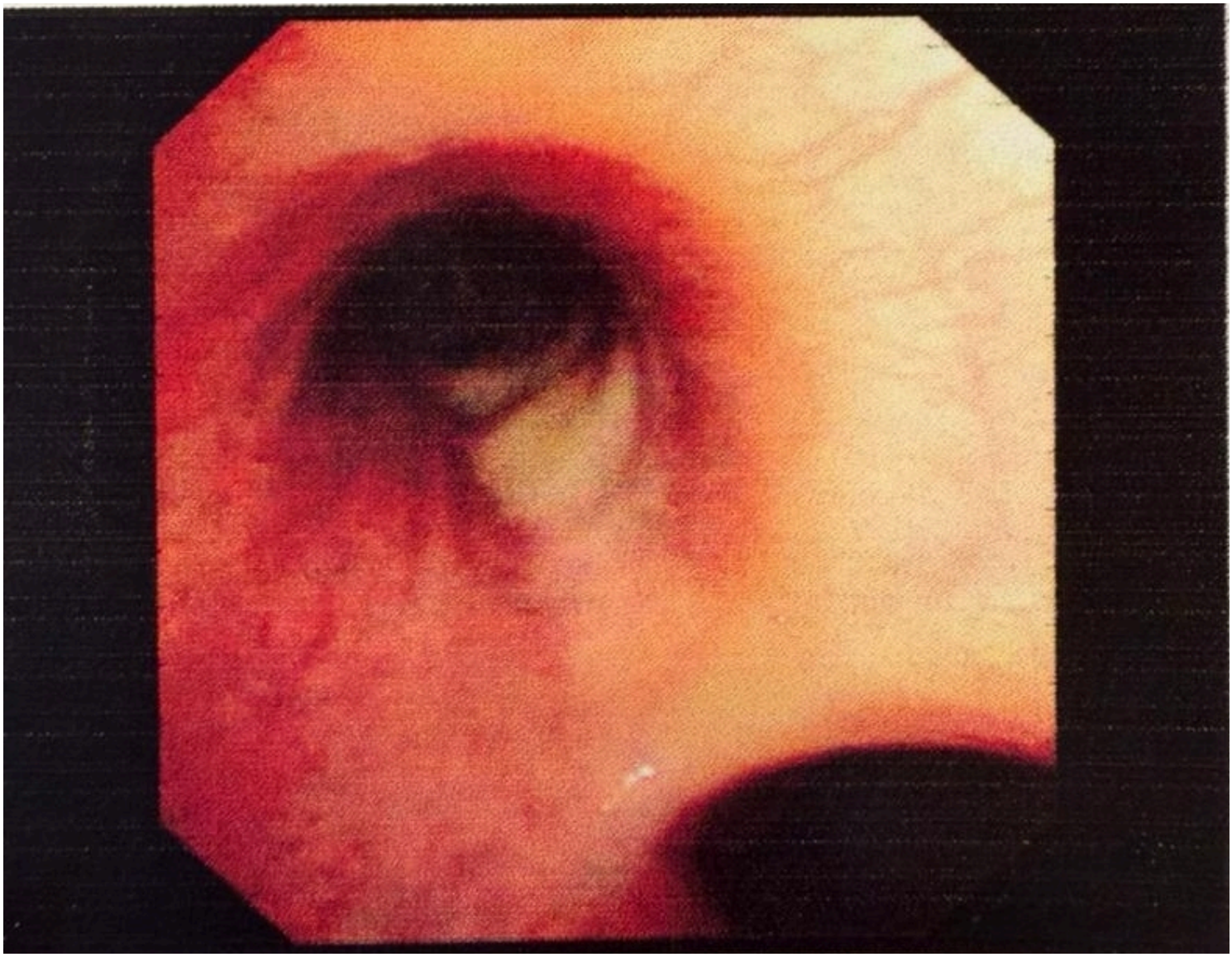


Figure 2

Visualizes the tracheal lumen containing mucopurulent secretions, consistent with inflammatory changes.

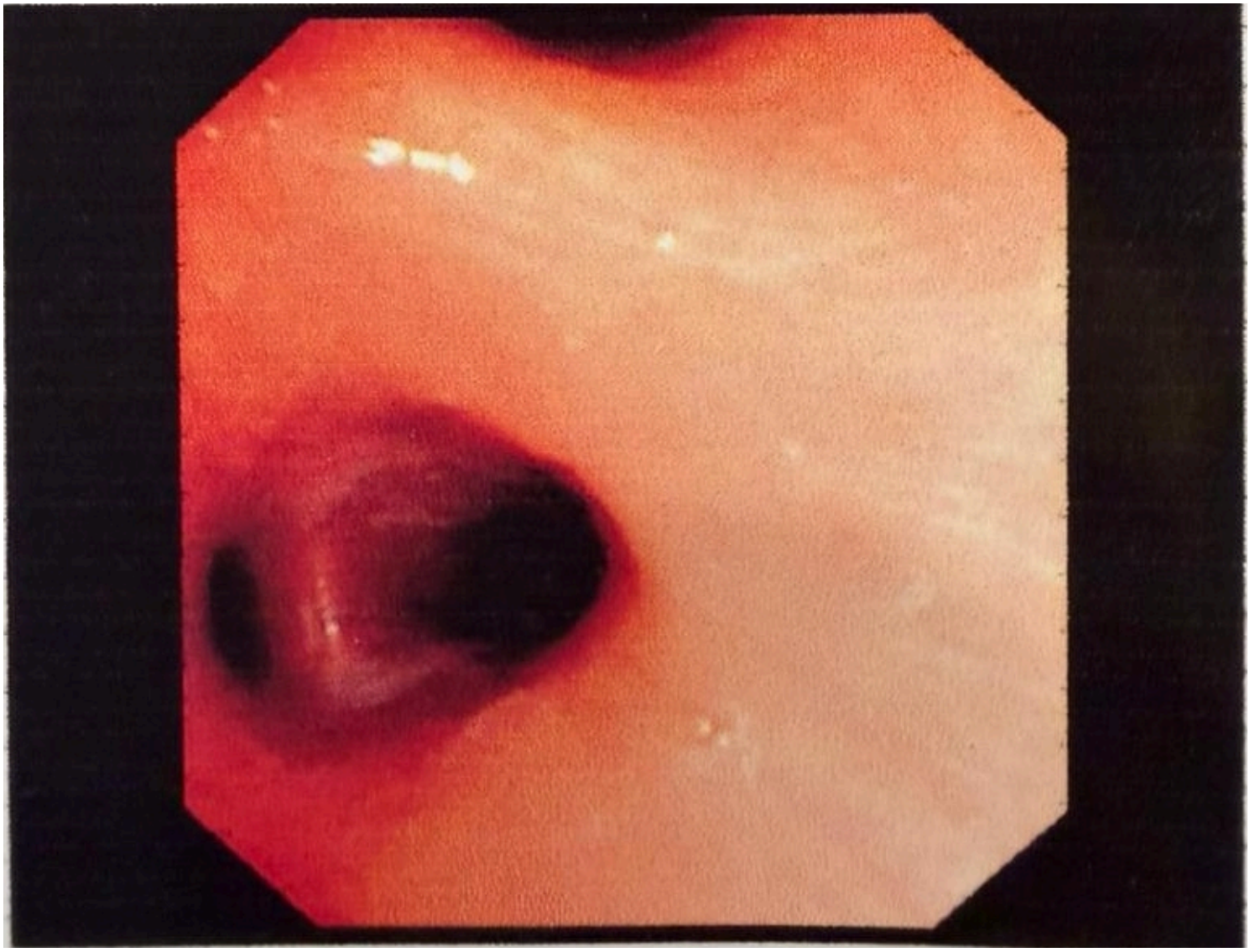


Figure 3

Depicts the bronchial tree with relatively preserved architecture, corresponding to the reported normal right bronchial tree.

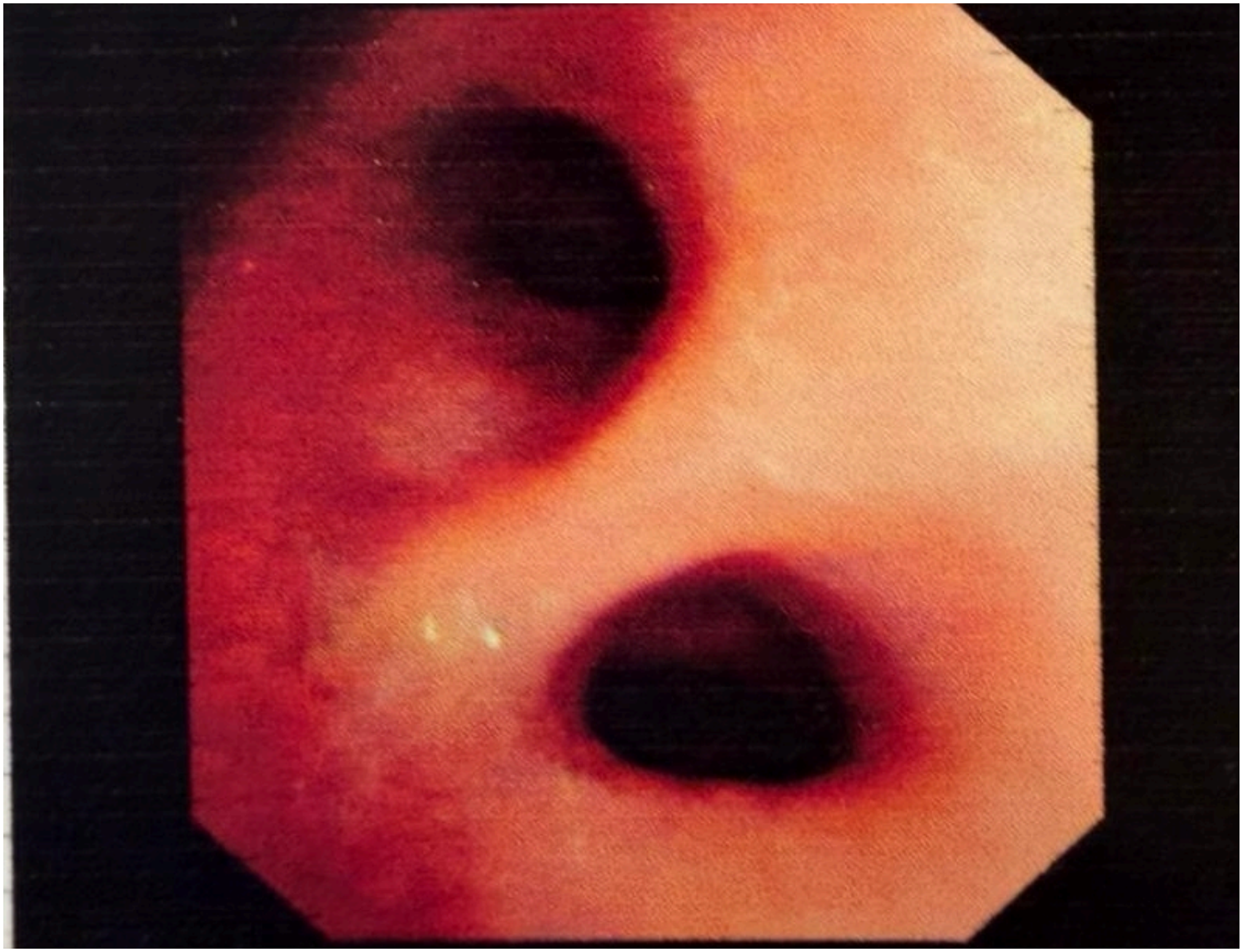


Figure 4

Shows the left bronchial system, where mucopurulent secretions are evident within the left main bronchus and extending into the left lower lobe bronchus, supporting the diagnosis of a localized infective process. Overall findings are consistent with features suggestive of left lower lobe infection, likely in the setting of post-nasal drip.