

Pulmonary Sequestration: A Cause of Recurrent Lung Abscesses in Adults and the Role of Surgical Management

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DOI: <https://doi.org/10.36347/sjmcr.2025.v13i07.049>

| Received: 22.05.2025 | Accepted: 17.07.2025 | Published: 25.07.2025

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Abstract

Case Report

Pulmonary sequestration is a rare congenital disorder that is often asymptomatic until adulthood, when it typically presents as recurrent pulmonary infections. We present the case of a 33-year-old female who experienced repeated episodes of lung abscesses in the right lung and was ultimately diagnosed with pulmonary sequestration. Despite extended courses of antibiotic treatment for each infection, her clinical symptoms recurred, necessitating surgical intervention. This case highlights the importance of considering structural lung abnormalities in patients with recurrent pneumonia and demonstrates the need for a multidisciplinary approach in managing such cases.

Keywords: Pulmonary sequestration, Recurrent lung infections, Lung abscess, Congenital anomaly, Surgical excision.

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INTRODUCTION

Pulmonary sequestration is an uncommon congenital anomaly characterized by dysplastic, non-functional lung tissue that lacks direct communication with the tracheobronchial tree but is supplied by a systemic blood source. Although it is typically diagnosed in childhood, some cases remain asymptomatic until adulthood, presenting as recurrent infections, hemoptysis, or occasionally detected incidentally on imaging. The management of pulmonary sequestration is challenging, particularly when complicated by recurrent abscesses. This report presents the case of an adult patient with repeated lung infections who was eventually diagnosed with pulmonary sequestration and treated with surgical excision.

CASE PRESENTATION

A 33-year-old, non-smoking female with no significant past medical history, except for a prior fibroid myomectomy, was referred for the third episodes of right lung infection. Her first episode occurred at the age of 19, where she was treated for pneumonia with pleural effusion. The second episode, in January 2023, was complicated by the development of right lung abscess, requiring intravenous antibiotics and a prolonged oral antibiotic course. However, in July 2024, she was readmitted again with fever and productive cough, and a third infection in the right lung was diagnosed.

A CT scan of the thorax revealed a $3.1 \times 2.6 \times 4.1$ cm cavitating lesion in the posterobasal segment of the right lower lobe with an air-fluid level. Further investigation demonstrated aberrant arterial supply from the abdominal aorta at the level of the celiac artery and venous drainage into the right inferior pulmonary vein. Additionally, a nidus (1.5×1.3 cm) fed by the right pulmonary artery was identified. These findings were consistent with pulmonary sequestration, confirming the diagnosis.

Given the recurrent nature of the infections and the structural nature of the lesion, a multidisciplinary discussion involving respiratory physicians, radiologists, and cardiothoracic surgeons was conducted. Surgical intervention was recommended. Preoperative pulmonary function tests revealed moderate impairment, with postoperative forced expiratory volume (FEV1) and diffusing capacity of the lungs for carbon monoxide (DLCO) at 50.1% and 58.2%, respectively.

The patient underwent right uniportal video-assisted thoracic surgery (VATS). During surgery, dense adhesions and numerous collateral vessels originating from the diaphragm were encountered and carefully managed. The apical segment of the right lung was also found to have blebs. Wedge resection of the extralobar sequestration and bullectomy of the right upper lobe were performed. The surgery was uneventful, and the patient was extubated in the operation room.

The patient was monitored in the cardiothoracic intensive care unit (CICU), where she remained hemodynamically stable with adequate pain control. Her chest tube was removed on postoperative day 1, and she was discharged on postoperative day 2. Follow-up imaging showed no evidence of residual pathology, and the patient was discharged on oral antibiotics with an appointment for outpatient rehabilitation.

DISCUSSION

This case highlights several key clinical and therapeutic issues in adults with pulmonary sequestration. The diagnosis is often delayed because pulmonary sequestration can present with complications such as recurrent infections, which may resemble the clinical presentation of recurrent pneumonia or lung abscesses. In this case, the diagnosis was made only after the third infection, underscoring the importance of maintaining a high index of suspicion for structural lung lesions when recurrent or persistent pneumonia is suspected.

Furthermore, the management of pulmonary sequestration must be individualized. Asymptomatic cases may be managed conservatively, while recurrent infections or complications, such as hemoptysis, often require surgical intervention. In this patient, the decision for surgery was based on the history of repeated infections and the structural nature of the lesion.

The use of uniportal VATS in this case demonstrates the feasibility of minimally invasive surgery even in complex cases involving dense adhesions and aberrant vasculature. This approach offers the advantages of less postoperative pain and quicker recovery, which is particularly beneficial in patients with pre-existing pulmonary disease.

This case also underscores the importance of a multidisciplinary approach. Radiologists played a crucial role in defining the vascular anatomy, and the collaboration between surgeons, radiologists, and anaesthesia teams ensured optimal perioperative management. Such teamwork is essential for achieving favourable outcomes in these challenging cases.

CONCLUSION

Pulmonary sequestration is a rare condition that should be considered in the differential diagnosis of recurrent lung infections, especially when they do not respond to standard antibiotic therapy. Imaging studies,

such as CT, are critical for early diagnosis and appropriate management. Surgical resection, particularly via minimally invasive techniques like uniportal VATS, provides a curative treatment for symptomatic cases and should be considered in collaboration with a multidisciplinary team. This case highlights the diagnostic and therapeutic challenges associated with pulmonary sequestration and emphasizes the importance of a coordinated approach to patient management.

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