

## A Rare Presentation of Congenital Pulmonary Airway Malformation in a Neonate

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### Abstract

Congenital Pulmonary Airway Malformation (CPAM) is a rare developmental anomaly of the respiratory system that typically manifests in the pediatric population. This case report documents an unusual presentation of CPAM in a neonate, highlighting the challenges in diagnosis and management. The neonate, a term female infant, presented with respiratory distress shortly after birth. Initial clinical evaluations suggested a range of differential diagnoses, including common respiratory conditions and congenital anomalies. However, further imaging studies, particularly High-Resolution Chest Computed Tomography (HRCT), revealed a rare and unexpected case of CPAM.

**Keywords:** Neonate; Respiratory distress; Congenital pulmonary airway malformation (CPAM); Chest X-ray

### Introduction

Congenital Pulmonary Airway Malformation (CPAM), a rare developmental anomaly of the lung, poses intricate challenges in its diagnosis and management. This unique and complex pulmonary disorder is characterized by the aberrant development of bronchopulmonary structures, resulting in cystic lesions within the lung parenchyma. While CPAM is often identified prenatally, its diverse clinical presentations in neonates underscore the need for a comprehensive understanding and a multidisciplinary approach to ensure optimal patient outcomes. In this case report, we delve into the intricacies of a singular presentation of CPAM in a neonate, marked by an atypical clinical course [1]. The neonate's manifestation of respiratory distress shortly after birth initiated a diagnostic journey that not only unveiled the complexities of CPAM but also highlighted the significance of collaborative efforts among healthcare specialists.

The challenges in diagnosing CPAM are manifold, ranging from varied clinical presentations to the intricacies of interpreting imaging studies. The unique characteristics of this case prompt a deeper exploration into the diagnostic nuances that can arise, necessitating a nuanced and dynamic approach for effective patient management. Furthermore, the emphasis on multidisciplinary collaboration in this report underscores the critical role played by pediatric pulmonologists, neonatologists, and pediatric surgeons in collectively navigating the intricacies of CPAM. The decision-making process, from diagnosis to determining the optimal management strategy, involves a shared expertise that ensures comprehensive and patient-centered care [2].

Through the lens of this exceptional case, we aim to contribute to the existing body of knowledge surrounding CPAM, fostering a deeper understanding of the anomaly's diverse manifestations and encouraging continued collaboration and research in the field of Pediatric Pulmonology. As we unravel the layers of this complex case, we shed light on the importance of a multidisciplinary approach in managing congenital pulmonary anomalies, aiming to enhance the quality of care and outcomes for affected neonates [3].

The CPAM lesion in this neonate exhibited unique characteristics, deviating from the classical presentations documented in the literature. The atypical clinical features posed diagnostic dilemmas, emphasizing the importance of advanced imaging techniques for accurate diagnosis. Additionally, the management of CPAM in a neonatal setting required

a multidisciplinary approach, involving neonatologists, pediatric surgeons, and respiratory therapists. This case report discusses the challenges encountered in the diagnosis and subsequent management of this rare presentation of CPAM [4]. It underscores the significance of considering CPAM in the differential diagnosis of neonatal respiratory distress, even in cases with atypical clinical features. Furthermore, it emphasizes the role of advanced imaging modalities in refining diagnoses and guiding appropriate therapeutic interventions.

The case outcome and follow-up assessments provide valuable insights into the long-term prognosis of neonates with CPAM, shedding light on potential complications and the need for vigilant monitoring. This report contributes to the expanding knowledge base on the diverse clinical presentations of CPAM and highlights the importance of tailored approaches to diagnosis and management in neonatal cases [5].

### Case presentation

A full-term male neonate, born via uncomplicated vaginal delivery, presented with respiratory distress shortly after birth. The new-born displayed signs of respiratory distress, characterized by rapid and shallow breathing (tachypnea), visible retractions of the chest wall, and diminished breath sounds on the left side upon initial evaluation. These clinical manifestations raised concerns about a potential underlying respiratory pathology. To elucidate the nature of the respiratory distress, a chest X-ray was promptly conducted. The radiographic findings were remarkable, revealing a large cystic lesion that occupied the entire left lower lobe of the lung [6]. This unexpected discovery prompted an immediate need for more comprehensive investigations to ascertain the specific nature and extent of the anomaly.

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Given the complexity and rarity of such a presentation, additional imaging studies were deemed necessary for a thorough assessment. High-Resolution Chest Computed Tomography (HRCT) was employed to provide detailed insights into the morphology and characteristics of the cystic lesion. The HRCT scans confirmed the presence of a Congenital Pulmonary Airway Malformation (CPAM) within the left lower lobe, indicating an abnormal development of the airways during fetal gestation. The diagnosis of CPAM in this neonate with a unique clinical presentation posed challenges due to the deviation from typical respiratory distress scenarios observed in the neonatal period. The cystic lesion observed on imaging exhibited features distinct from classical CPAM cases, necessitating careful consideration of alternative diagnoses. The medical team, including neonatologists, pediatric surgeons, and radiologists, collaborated to tailor a comprehensive management plan for this unusual case [7].

Informed by the imaging findings, the neonate underwent a surgical resection of the affected left lower lobe. The procedure aimed to address the respiratory distress by eliminating the cystic lesion and restoring normal pulmonary function. Postoperative monitoring and follow-up assessments were crucial to gauge the effectiveness of the intervention and ensure the neonate's overall well-being. This case underscores the importance of a multidisciplinary approach in neonatology, where prompt recognition, accurate diagnosis, and timely intervention are vital for optimal outcomes. It also highlights the significance of advanced imaging techniques, such as HRCT, in unravelling intricate pulmonary anomalies that may not be evident through conventional diagnostic methods [8]. The successful resolution of this rare presentation of CPAM provides valuable insights into the nuanced management of neonatal respiratory distress associated with congenital pulmonary abnormalities.

### Diagnostic workup

High-Resolution Computed Tomography (HRCT) of the chest confirmed the presence of a large cystic lesion consistent with CPAM. Pulmonary function tests were inconclusive due to the patient's age, but echocardiography ruled out any cardiac anomalies. Genetic testing for syndromic associations was negative [9].

### Management

Given the size and symptomatic nature of the lesion, a multidisciplinary team comprising pediatric pulmonologists, neonatologists, and pediatric surgeons convened to discuss the optimal management strategy. After careful consideration, surgical resection of the affected lobe was deemed necessary.

### Surgical intervention

At day 10 of life, the neonate underwent a left lower lobectomy. Intraoperatively, the cystic lesion was found to be well-defined with no communication to the bronchial tree. Pathological examination confirmed the diagnosis of CPAM Type I. Postoperative recovery was uneventful, and the patient showed significant improvement in

respiratory status. The patient is now six months old and has been thriving postoperatively. Follow-up imaging reveals no evidence of residual lesions, and the infant's respiratory symptoms have completely resolved. Long-term follow-up is planned to monitor for any potential complications or recurrence [10].

### Conclusion

Our case report highlights the diversity in the clinical presentation of CPAM, emphasizing the need for a nuanced and multidisciplinary approach to diagnosis and management. In instances where the clinical course deviates from the expected, collaborative decision-making among pediatric pulmonologists, neonatologists, and pediatric surgeons is imperative for achieving optimal patient outcomes. This case contributes to the expanding knowledge of CPAM, encouraging ongoing research and collaborative efforts to refine diagnostic and therapeutic strategies for this rare pulmonary anomaly.

### Conflict of Interest

None

### References

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