

# Congenital Lung Malformations: A Visual Exploration of Imaging Patterns and Diagnostic Strategies

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## Introduction

Congenital lung malformations represent a diverse group of anomalies arising from aberrant fetal lung development. These malformations, ranging from benign cysts to life-threatening masses, pose diagnostic challenges due to their variable presentations. This article aims to unravel the imaging patterns of CLMs through a visual exploration and provide insights into diagnostic strategies for accurate characterization. CPAM, formerly known as congenital cystic adenomatoid malformation comprises abnormal lung tissue development. Imaging reveals multicystic or solitary cystic lesions, often with varying sizes and distribution throughout the affected lobe. CT demonstrates cystic spaces with air-fluid levels and may show associated pulmonary parenchymal hyperinflation [1].

## Description

Intralobar sequestrations are more common and lack a separate pleural covering, often presenting as consolidated lung tissue. Extralobar sequestrations have their own pleural covering and are typically located outside the lung's normal boundaries. Arises from abnormal budding of the tracheobronchial tree during embryogenesis. Radiographically, bronchogenic cysts appear as well-defined, round or oval, thin-walled cystic lesions adjacent to the trachea or mainstem bronchi. The term congenital lung malformation encompasses a wide array of pathological conditions with diverse imaging and clinical presentations. These anomalies result from aberrant embryological lung development, occurring at various stages of prenatal life. Their natural history varies, ranging from asymptomatic individuals who may remain undetected until adulthood to neonates experiencing respiratory distress. Through an extensive review of literature via the Indexed at database, we have explored the diagnostic approaches and findings associated with congenital lung abnormalities. Additionally, utilizing our RIS-PACS database, we have identified cases with a confirmed diagnosis of congenital lung malformation. Various diagnostic modalities have been employed, including plain radiographs, CT scans, prenatal ultrasound, and MR images, to study clinical cases. The most prevalent anomalies encountered fall into three categories: bronchopulmonary vascular anomalies (including arteriovenous malformations), and combined lung and vascular anomalies (like scimitar syndrome and bronchopulmonary sequestration) [2,3].

CLM significantly impacts morbidity and mortality, underscoring the importance of recognizing these abnormalities for optimal prenatal counseling and early peri- and postnatal management. This pictorial review aims to highlight relevant imaging findings to provide diagnostic clues for both radiologists and pediatric consultants, aiding in the differential diagnosis of congenital lung malformations. Using the Indexed at database, we conducted a comprehensive literature review focusing on congenital lung malformations, their diagnostic approach, and imaging findings. Our search utilized keywords including congenital lung malformations, congenital thoracic malformations

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and congenital lung anomalies. These were combined with terms such as imaging evaluation, imaging guidelines, computed tomography, radiography, MR imaging, and ultrasound. Our search criteria did not specify a particular timeframe, ensuring inclusivity of all relevant studies. We restricted our search to articles written in English to facilitate access to complete content. Exclusion criteria encompassed articles in languages other than English and duplicates from the same authors. Information pertinent to our review was extracted from original articles, reference guidelines, and prior reviews. Articles were assessed based on their title, abstract, and bibliography to ascertain their relevance to our review objectives. Only publications deemed suitable were included in our analysis [4,5].

## Conclusion

Nephrology has entered an era of unprecedented progress, marked by therapeutic breakthroughs and innovative clinical perspectives. From precision medicine and immunotherapies to AI diagnostics and patient-centered care models, these advancements hold the promise of transforming the landscape of kidney disease management. As we continue to unravel the complexities of nephrology, a multidisciplinary approach that integrates cutting-edge research with patient-centric care will be pivotal. By fostering collaboration and embracing emerging technologies, the field can strive towards a future where kidney diseases are not just treated but prevented, and where patients can lead healthier lives with kidneys unveiled from the shadows of disease.

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## Conflict of Interest

None.

## References

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