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Hybrid Congenital Lung Lesion: Pulmonary Sequestration with Congenital Pulmonary Airway Malformation in a 7-Day-Old Neonate: A Case Report

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Abstract: ***Pulmonary sequestration and congenital pulmonary airway malformation are uncommon developmental lung anomalies, and their coexistence as a hybrid congenital lung lesion is particularly rare. The case describes a 7-day-old term female neonate with a congenital lung lesion first detected on antenatal ultrasonography. Prenatal imaging showed a well-defined echogenic lesion supplied by an abnormal systemic artery from the descending thoracic aorta, with mediastinal shift and compression of the opposite lung. After birth, the neonate developed transient tachypnoea but remained clinically stable without supplemental oxygen. Contrast-enhanced CT demonstrated an abnormal lung segment in the posterior basal region of the left lower lobe supplied by a 3.6 mm systemic artery arising from the descending thoracic aorta at the D10 level. A separate thin-walled cyst in the superior basal segment raised suspicion of an associated congenital pulmonary airway malformation, supporting the diagnosis of a hybrid congenital lung lesion. The case underlines the value of antenatal ultrasonography for early recognition and postnatal CT angiography for defining the lesion, systemic arterial supply, and associated cystic changes. Accurate imaging is essential for diagnosis, surgical planning, and timely management, even when the newborn is clinically stable.***

Keywords: pulmonary sequestration, congenital pulmonary airway malformation, hybrid lung lesion, neonate

1. Introduction

Pulmonary sequestration is a rare congenital lung malformation characterized by dysplastic lung tissue that lacks normal communication with the tracheobronchial tree and receives its arterial supply from the extrapulmonary circulation, most commonly from descending thoracic aorta. It can be classified into intralobar and extralobar types based on its pleural relation and venous drainage.

Congenital pulmonary airway malformation is another developmental anomaly of the lung resulting from disorganized proliferation of trachea-bronchial tree. The coexistence of pulmonary sequestration and CPAM, referred to as hybrid congenital lung lesion, is uncommon and poses diagnostic and management challenges. Advances in prenatal ultrasonography and postnatal CT angiography have significantly improved early detection of these lesions by accurately depicting the anomalous systemic arterial supply.

2. Case Presentation

A 7-day-old term female neonate, born at 40 weeks of gestation with a birth weight of 2.8kg, was referred to our department for evaluation of an antenatally detected congenital pulmonary lesion. Antenatal ultrasonography had demonstrated a large, well-circumscribed, hyperechoic lesion in the left hemithorax receiving systemic arterial supply from the descending thoracic aorta, with associated mediastinal shift towards the right and compression of the right lung, raising the possibility of pulmonary sequestration, with type III congenital pulmonary airway malformation (CPAM) considered as a differential diagnosis.

Following birth, the neonate developed transient tachypnoea of newborn (TTN). Clinical examination revealed stable vital signs with adequate oxygen saturation on room air. There was no history of cyanosis, fever, or feeding difficulty.

Postnatal contrast-enhanced CT of the thorax demonstrated an ill-marginated patch of air-space disease measuring 1.2 × 2.7 × 3.0 cm in size in posterior basal segment of the left lower lobe. The lesion was supplied by a 3.6 mm systemic feeding artery arising from the left lateral surface of the descending thoracic aorta at D10 vertebral level. In addition, a 9 × 9 mm well-circumscribed cyst was identified in the superior basal segment of left lower lobe, raising the possibility of associated hybrid congenital lung lesion (pulmonary sequestration with CPAM). No pleural effusion, mediastinal shift, or mediastinal lymphadenopathy was identified. The rest of the lung parenchyma, trachea-bronchial tree, bony thorax and adrenal glands were unremarkable. The neonate remained hemodynamically stable throughout the hospital stay, required no supplemental oxygen, and was discharged in satisfactory condition on room air with advice for outpatient follow-up and surgical consultation for further management.

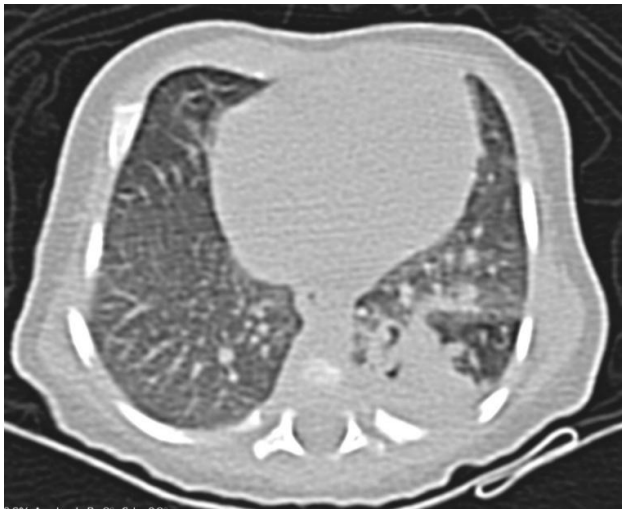

Figure 1: CT scan dated 02/07/2026 in axial lung window – showing ill-marginated area of air-space disease in posterior basal segment of left lower lobe

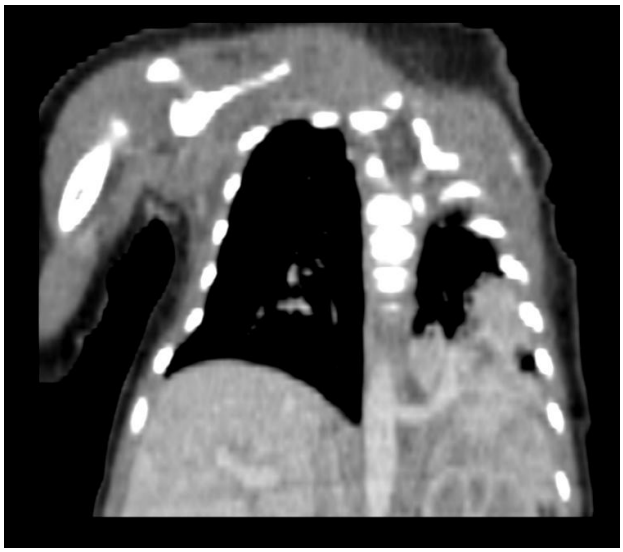

Figure 2: CT scan dated 02/07/2026 in coronal soft tissue window – showing systemic artery arising from descending thoracic vertebra supplying the sequestered lung segment

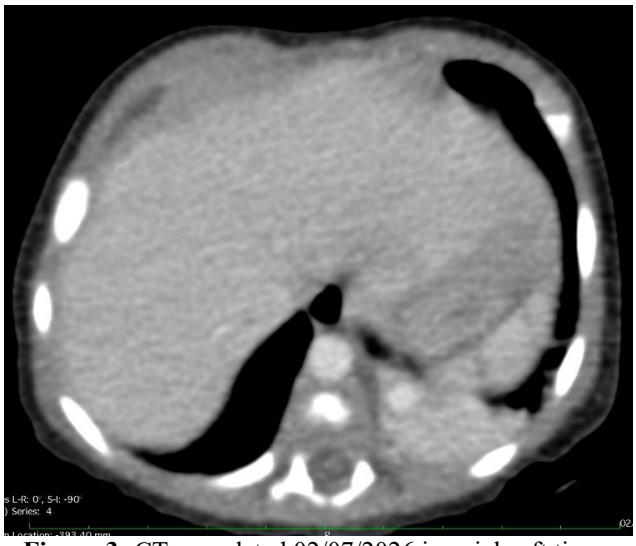

Figure 3: CT scan dated 02/07/2026 in axial soft tissue window- showing systemic artery supplying the sequestered lung segment

3. Case Discussion

Congenital lung anomalies are a heterogeneous group of rare disorders. Pulmonary sequestration and congenital pulmonary airway malformations are both congenital lung anomalies which are considered as distinct entities. However, lesions which contain features of both entities can be present which are called as hybrid congenital lung lesions. These lesions most commonly consist of type II congenital pulmonary airway malformation with intralobar type of pulmonary sequestration. However, other types have also been reported in cases.

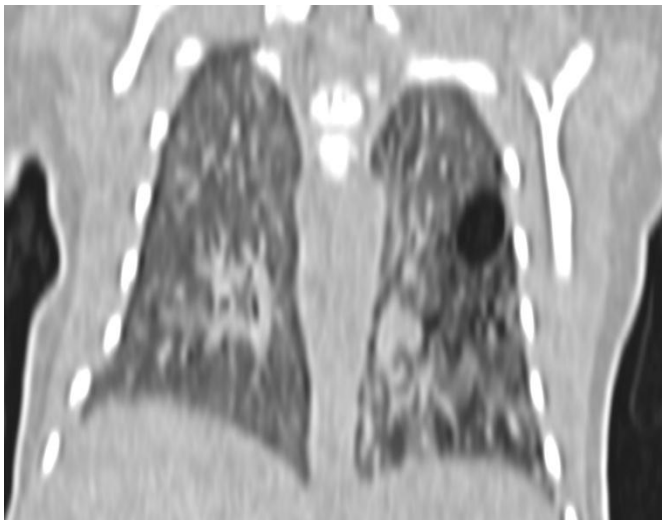

Figure 4: CT scan dated 02/07/2026 in coronal lung window – showing thin-walled cyst in superior basal segment of left lower lobe which is compatible with hybrid lung disease in association with features of pulmonary sequestration.

On imaging, presence of systemic arterial supply with cystic changes raises possibility of a hybrid lesion and is crucial for its diagnosis in order to start with early treatment. Pulmonary sequestration is a dysplastic lung tissue that lacks normal communication with the trachea-bronchial tree that receives its arterial supply from the extrapulmonary circulation, most commonly from descending thoracic aorta. However, there have been cases which have demonstrated arterial supply from intercostal, subclavian, celiac, splenic and coronary arteries. Congenital pulmonary airway malformation is another developmental anomaly of the lung resulting from disorganized proliferation of trachea-bronchial tree which can present as cystic as well as solid lung lesions on imaging.

Our case demonstrates presence of a sequestered lung segment receiving its arterial supply from descending thoracic aorta and features of CPAM, compatible with hybrid lung lesion.

Antenatal ultrasonography plays an important role in the detection of congenital lung malformations. Features of an echogenic lung mass receiving extra-pulmonary arterial supply is highly suggestive of pulmonary sequestration. In our case, a large, well-circumscribed, hyperechoic lung lesion was seen in antenatal ultrasonography, receiving its systemic arterial supply from the descending thoracic aorta, with associated mediastinal shift, raising the possibility of pulmonary sequestration, with CPAM considered as a differential diagnosis.

Postnatal contrast-enhanced CT becomes the imaging modality of choice to demonstrate the morphology as well as extent of lesion. It can also help determine the systemic arterial supply as well as the venous drainage. In our case, CT demonstrated an ill-marginated area of air-space disease in posterior basal segment of the left lower lobe, supplied by a systemic artery arising from descending thoracic aorta. In addition, a separate well-marginated cyst was identified in the superior basal segment of left lower lobe. These findings raised the possibility of hybrid congenital lung lesion.

Hybrid lung lesions can have different presentations. It can present as asymptomatic lung masses detected on antenatal ultrasonography or can present with recurrent respiratory infections and respiratory distress. In our case, patient had developed transient tachypnoea of newborn soon after birth but remained hemodynamically stable and required no supplemental oxygen. As the patient recovered within few days on conservative management on room air, symptoms were most likely attributed due to transient tachypnoea of newborn rather than a congenital lung lesion.

Management of hybrid lung lesions depends on the size and type of lesion, hemodynamic status of the patient and associated complications. Surgical resection may be considered even in asymptomatic patients as there is risk of complications such as recurrent pulmonary infections, cardiac failure, pneumothorax, hemorrhage as well as rare risk of malignant transformation. Elective surgery after detailed evaluation using contrast enhanced imaging provides excellent patient outcome as well accurate histopathological diagnosis.

Our case highlights the importance of prenatal ultrasonography and postnatal imaging for early diagnoses of hybrid lung lesions. Recognition of systemic arterial supply as well as cystic changes is crucial to diagnose this condition and for appropriate management plan.

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