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Pulmonary Sequestration Associated With A Gastric Duplication Cyst – A Rare Case Report

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Abstract
Introduction:
We present a rare case of intralobar pulmonary sequestration associated with a gastric duplication cyst, came to our tertiary care center.
Case Details:
A 30-year-old female presented with left-sided chest pain and intermittent cough and cold for one year. Contrast-enhanced CT (CECT) showed a well-defined lesion in the posterobasal segment of left lower lobe. There is no communication with the tracheobronchial tree. The lesion received arterial supply from an aberrant branch of descending thoracic aorta and drained via the left inferior pulmonary veins. This is consistent with intralobar pulmonary sequestration. There is a circumscribed non-enhancing cystic lesion adjacent to gastro-oesophageal junction (GEJ) and greater curvature of the stomach, without communication with the gastric lumen. This is consistent with a gastric duplication cyst. There were no acute complications and other thoracoabdominal structures were normal. Surgical correlation was advised for confirmation and management.
Conclusion:
Concurrent intralobar pulmonary sequestration and gastric duplication cyst is extremely rare and supports a shared embryological origin. Precise imaging helps in identification of both anomalies, guiding surgical planning and multidisciplinary care.
Keywords: *Pulmonary sequestration; Gastric duplication cyst; Foregut duplication; Intralobar sequestration; Congenital anomaly.*

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I. Introduction

Pulmonary sequestration (PS) is a rare congenital pulmonary malformation characterized by non-functioning lung tissue, which has no connection with tracheobronchial tree or pulmonary arteries and supplied by systemic arteries that arises from thoracic or abdominal aorta. The venous drainage commonly returns to the pulmonary veins. It accounts for around 0.15–6.4% of congenital pulmonary malformations and occurs most commonly in the posterior basal segment of lower lung lobes.[1] Recent retrospective data from 13 cases treated between 2019 and 2023 reported the mean patient age of 38 years, and there are nine intralobar and three extralobar sequestrations identified. Systemic arterial supply was derived from the descending thoracic aorta in most cases. Minimally invasive thoracoscopic resection—with enhanced preoperative 3D vascular reconstruction—is becoming preferred approach now a days providing favorable postoperative outcomes.[2]

Gastric duplication cysts (GDCs) are uncommon foregut duplication anomalies that commonly arise along the greater curvature of the stomach. These lesions are non-communicating cystic masses lined by gastrointestinal or respiratory epithelium and share smooth muscle layers with the gastric wall.[3-4] They can present with abdominal pain, nausea, or incidentally during imaging studies.[5]

Asymptomatic or incidentally detected GDCs carry risk of complications, like superinfection and malignant transformation, which needs surgical excision.

Bronchopulmonary foregut malformations are a spectrum of congenital anomalies including PS, duplication cysts, bronchogenic cysts, and congenital pulmonary airway malformations.[6] Coexistence of pulmonary sequestration and a gastrointestinal duplication cyst is rare and reflects shared embryological origins. One recent case report described intralobar sequestration associated with a gastric enterogenous cyst ("gastric lung"), highlighting this unusual association. Surgical resection is the mainstay of treatment for symptomatic lesions to avoid complications and to confirm histopathological diagnosis.

II. Case Report Details

A 30-year-old female presented complaining of left-sided chest pain and episodic cough and cold for around one year. The pain was non-pleuritic and intermittent, with no associated symptoms or systemic signs.

On CE-CT imaging, a well-defined lesion was seen in the posterobasal segment of the left lower lobe. It showed no communication with the tracheobronchial tree. The lesion received arterial supply from aberrant branch of descending thoracic aorta and drained through left inferior pulmonary veins. These features are consistent with intralobar pulmonary sequestration. Coronal arterial-phase images showed aberrant systemic feeding vessel from the descending aorta coursing to the sequestrated segment.

Separate cystic lesion noted abutting the gastro-oesophageal junction(GEJ) and greater curvature of the stomach within or adjacent to the gastric wall. It appeared as thin-walled, fluid-filled, non-enhancing lesion without septations, calcifications, or communication with the gastric lumen. This findings imply gastric duplication cyst. Other thoracic and abdominal structures are normal, with no signs of acute infection, hemorrhage, or other complications.

This combination of intralobar pulmonary sequestration and gastric duplication cyst implies a spectrum of congenital foregut anomalies. Surgical consultation was suggested for definitive diagnosis and management.

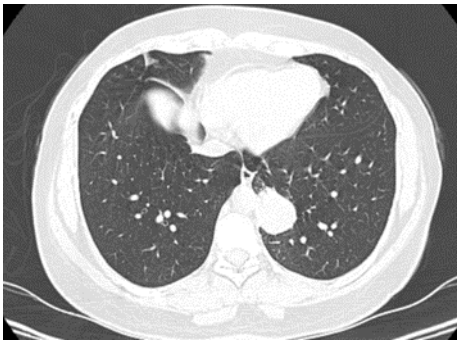


Figure 1. Axial CT scan in lung window showing a well-defined lesion in the posterior basal segment of the left lower lobe. The lesion shows no communication to the bronchial tree.

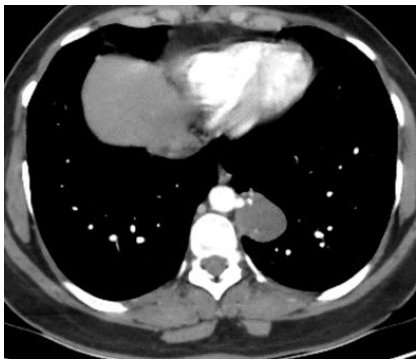
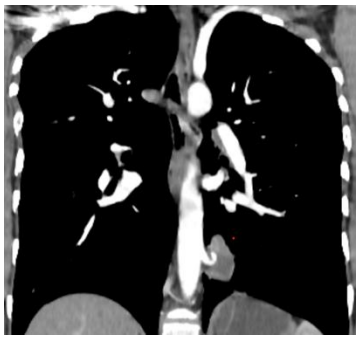


Figure 2. Axial C + arterial phase



Coronal C + arterial phase at the same level showing a systemic arterial supply to the sequestrated segment arising from the descending thoracic aorta. The lesion appears cystic to solid with no communication to the bronchial tree.

Figure 3: Coronal C + arterial phase image showing a anomalous artery arising from the descending thoracic aorta and coursing towards left lower lobe, supplying the intralobar pulmonary sequestration.

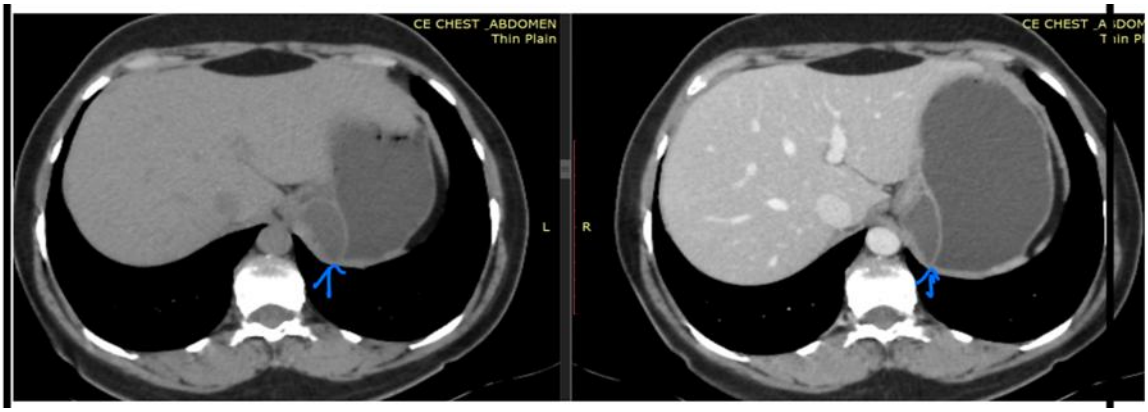
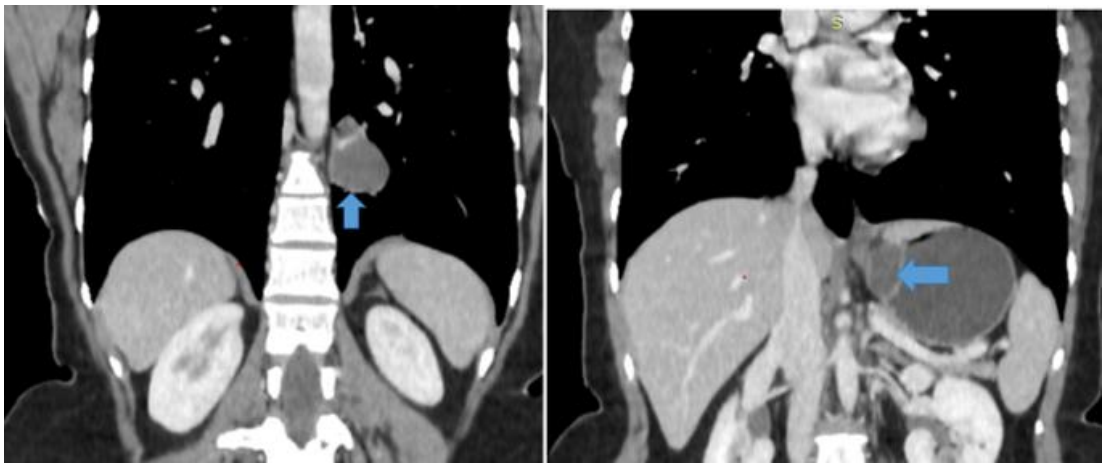


Figure 4.
Axial CT images of the upper abdomen: (left) non-contrast and (right) contrast-enhanced phases showing a well-defined, fluid-filled, thin-walled cystic lesion located along the greater curvature of the stomach, without evidence of enhancement or internal septations.



Sequestration and duplication cysts are seen in coronal view

III. Discussion

Bronchopulmonary foregut malformations (BPFMs) are a spectrum of congenital disorders that include pulmonary sequestration, congenital pulmonary airway malformation (CPAM) and foregut duplication cysts. These anomalies occur due to abnormal budding of primitive foregut and lung buds in early embryological development—supporting shared origin when pulmonary sequestration and a duplication cyst coexist.

Pulmonary sequestration is a nonfunctioning lung segment that is not connected to the bronchial tree and pulmonary veins supplied by aberrant systemic arteries (most commonly from the thoracic aorta), and classified as intralobar or extralobar.[7] Intralobar sequestration constitutes for ~75% of cases, and involves most commonly posterior basal segment of the left lower lobe, and drains through pulmonary veins—creating a left-to-left shunt.[8]

Intralobar sequestration usually presents during adolescence or adulthood, manifesting as chronic cough, recurrent pulmonary infections, chest pain, or hemoptysis. Imaging—especially CT angiography—shows aberrant systemic supply (usually from descending thoracic aorta) and pulmonary venous drainage; this is main for planning surgical resection.

Gastric duplication cysts, a subtype of foregut duplication cysts, are usually asymptomatic but may present with abdominal discomfort, infection, or mass effects. Pathologically, they share a smooth muscle wall and are lined by gastric or respiratory epithelium.

Only a single previous case has been reported of intralobar pulmonary sequestration associated with a gastric enterogenous duplication cyst.[9]

In our presented case, the patient was asymptomatic with clearly delineated anatomy on imaging, which facilitated surgical planning. Surgical resection is the standard of care for symptomatic pulmonary sequestration and duplication cysts to prevent complications like infection, hemorrhage, and the rare risk of malignant transformation.

IV. Conclusion

Multidisciplinary surgical evaluation is essential for definitive management. This case showed the importance of considering bronchopulmonary foregut malformations when encountering thoracoabdominal cystic lesions.

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