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Case Report

Radiology Section

Congenital Bronchogenic Cyst Causing Obstructive Emphysema in a Two-Month-Old Infant: A Case Report

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ABSTRACT

Congenital bronchogenic cysts are rare developmental anomalies of the embryonic foregut. We present a case of a two-month-old infant with a congenital bronchogenic cyst causing obstructive emphysema and respiratory distress. The infant was born full-term with mild respiratory distress at birth, which resolved spontaneously. However, recurrent episodes of respiratory distress led to admission. Initial X-rays showed no abnormalities, but subsequent imaging revealed a hyperlucent left lung with mild mediastinal shift. A Computed Tomography (CT) scan demonstrated a hypodense lesion in the subcarinal region, compressing the left main bronchus and resulting in obstructive emphysema. The infant underwent surgical excision, with histopathology confirming a bronchogenic cyst. This case highlights the importance of considering congenital bronchogenic cysts in infants presenting with respiratory distress and emphasises the role of advanced imaging techniques in diagnosis.

Keywords: Chest radiograph, Congenital bronchogenic cyst, Computed tomography, Infant, Obstructive emphysema, Respiratory distress

CASE REPORT

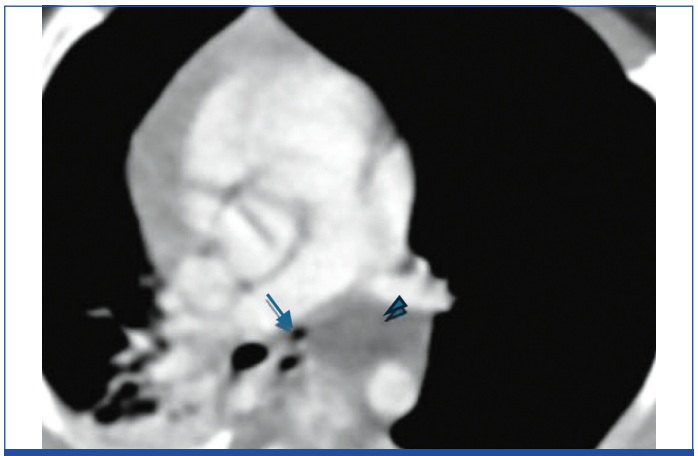
A two-month-old male infant was admitted with a history of fever and respiratory distress. The infant was born full-term via normal vaginal delivery with a birth weight of 2.8 kg and experienced mild respiratory distress at birth, which resolved spontaneously. The prior antenatal scans were unremarkable. However, he developed recurrent episodes of respiratory distress, prompting hospital admissions. The child then presented with fever, moderate respiratory distress, and was unable to take food properly for ten days.

On admission, the child had moderate respiratory distress (Respiratory rate 60/min, subcostal retractions, SpO_2 89% on room air), and auscultation revealed decreased breath sounds on the left-side with wheeze.

Initial X-rays did not reveal any abnormalities; however, subsequent imaging showed hyperlucent left lung parenchyma with mild mediastinal shift [Table/Fig-1].

[Table/Fig-1]: Frontal chest radiograph showing hyperlucent left lung (arrow) with mild mediastinal shift.

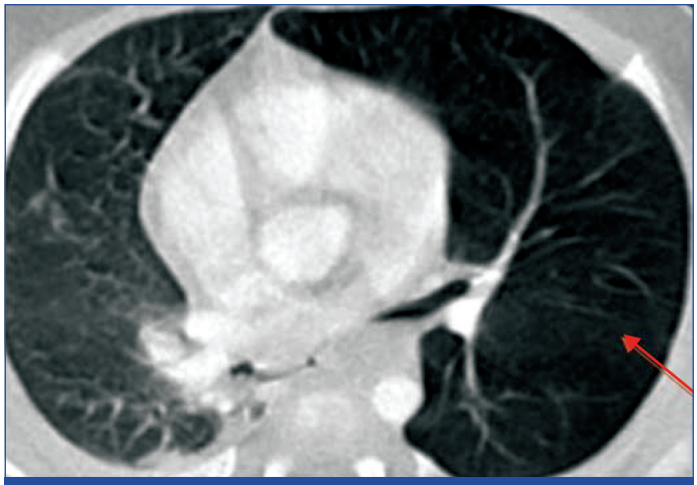
Further evaluation with plain and Contrast-Enhanced Computed Tomography (CECT) of the chest revealed a round to oval lesion epicentered in the subcarinal region, left to the midline, with hypodense attenuation on plain CT. The lesion was situated between the left main bronchus anteriorly, the aorta posteriorly, and the oesophagus medially. It measures 8 mm (AP) × 14 mm (transverse) × 11 mm (craniocaudally). It did not demonstrate appreciable post-contrast enhancement. Moreover, the lesion caused compression of the adjacent left main bronchus, resulting in significant luminal narrowing measuring 7-8 mm and obstructive emphysema in the left lung, as shown by hypodense attenuation in the left lung parenchyma. Additionally, there were areas of airspace consolidation in the posterior segment of the right upper lobe, the superior and posterior basal segments of the right lower lobe [Table/Fig-2-4].



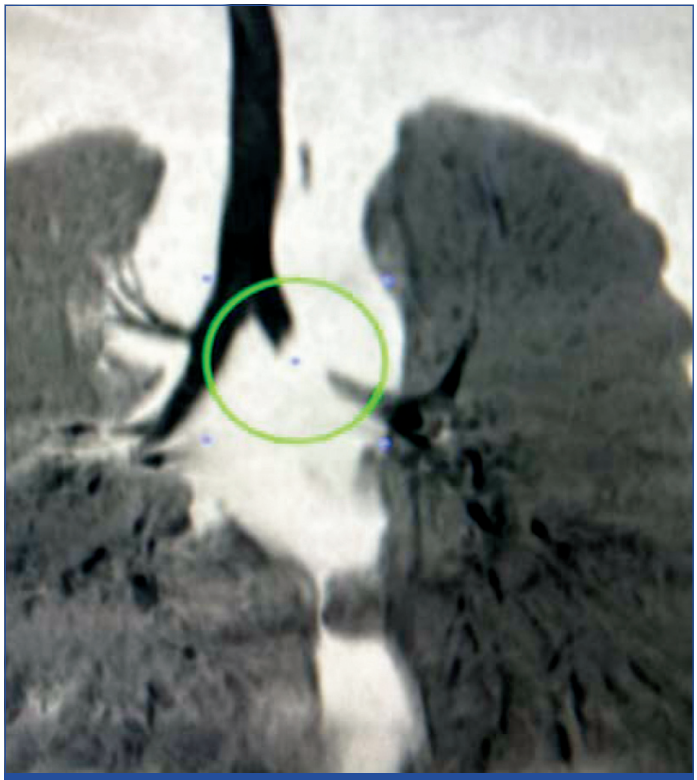
[Table/Fig-2]: Contrast-enhanced axial CT of the chest just below the level of the carina shows narrowing of the left main bronchus (arrow) due to compression caused by a bronchogenic cyst, which shows no enhancement (arrowhead).

The infant underwent surgical excision of the cyst via thoracotomy [Table/Fig-5]. Intraoperatively, a well-encapsulated cyst was identified adjacent to the left main bronchus and carefully excised. There were no complications during the surgery. Histopathology revealed a cyst lined by pseudostratified ciliated columnar epithelium with cartilage and bronchial glands, consistent with a bronchogenic cyst [Table/Fig-6].

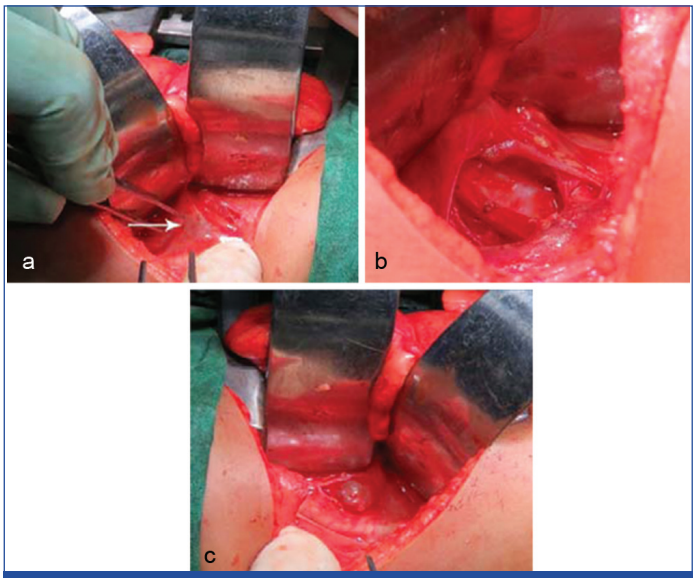
The postoperative course was uneventful, with improved oxygenation and resolution of respiratory distress. Follow-up chest radiograph showed re-expansion of the left lung. The baby was discharged on day six and remains well at six-month follow-up.



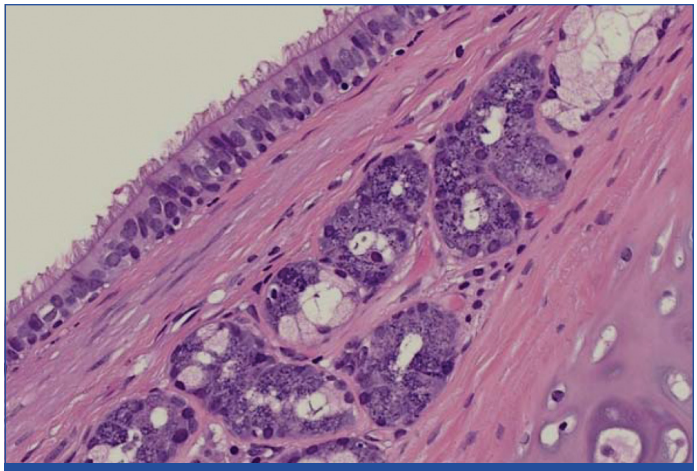
[Table/Fig-3]: CECT axial image in lung window at the midthoracic level showing hypodense attenuation of the left lung parenchyma suggestive of obstructive emphysema due to left main bronchus compression by the cyst.



[Table/Fig-4]: Multiplanar coronal section showing focal discontinuity of the left main bronchus (circle) immediately after its origin.



[Table/Fig-5]: Intraoperative photographs showing surgical excision of bronchogenic cyst (arrow).



[Table/Fig-6]: Histopathology reveals a bronchogenic cyst lined by pseudostratified ciliated columnar epithelium. (H&E stain).

DISCUSSION

Congenital bronchogenic cysts are rare cystic malformations of the respiratory tract. They account for 10-15% of mediastinal tumours and 50-60% of mediastinal lesions, with an incidence of 1 per 42,000 to 68,000 [1,2]. They arise from abnormal budding of the tracheobronchial tree or embryonic ventral lung bud during embryogenesis, specifically between the 26th and 40th day of gestation [2,3]. These cysts are a type of bronchopulmonary foregut malformation and are lined with respiratory epithelium (i.e., ciliated pseudostratified columnar epithelial cells with occasional mucin-filled goblet cells) and are composed of variable amounts of hyaline cartilage, smooth muscle and/or seromucous bronchial glands. The fluid content within these cysts can be serous or mucinous, and, if they communicate with the tracheobronchial tree, they may occasionally contain air, which is rare. Their location typically corresponds to their embryological development, with central (mediastinal) cysts forming earlier in the developmental process, while more peripheral cysts indicate later formation [2].

In this case, the infant presented with respiratory distress secondary to obstructive emphysema caused by compression of the left main bronchus by the bronchogenic cyst, producing a “ball-valve” mechanism leading to air trapping and hyperinflation of the left lung. Similarly, a case reported by Vimala LR et al., described a 1.5-month-old infant presenting with respiratory distress and unilateral hyperinflation, initially misdiagnosed as pneumothorax or congenital lobar emphysema on chest radiograph. Subsequent CT revealed a mediastinal bronchogenic cyst causing obstructive emphysema and mediastinal shift [4].

Arun S et al., also reported a neonate in whom a chest radiograph suggested congenital lobar emphysema, but CT demonstrated a mediastinal cyst producing bronchial compression and air trapping [5].

In another report by Singh A et al., an antenatally detected bronchogenic cyst remained asymptomatic at birth but later presented with respiratory distress due to airway compression and emphysema, highlighting the potential for delayed presentation despite early detection [6].

Likewise, Meshram RM et al., described a 37-day-old male infant who presented with failure to thrive, feeding difficulty, respiratory distress and cyanosis. His chest radiograph was suggestive of a shift of mediastinum and heart with a hyperinflated left lung. CT thorax showed a minimal enhancing cystic lesion posterior to the trachea and its bifurcation on the right side, which was compressing the right main bronchus. The cyst was successfully surgically excised; it was adherent to the carina, had intrabronchial extension, and its histopathological findings confirmed a bronchogenic cyst [7].

The differential diagnosis for bronchogenic cysts includes conditions that cause unilateral hyperlucent lung in infants. These include congenital lobar emphysema, and pulmonary sequestration.

Congenital lobar emphysema usually presents with hyperinflation of a single lobe without an identifiable extrinsic obstructing lesion. Although the radiographic images in our case seemed similar to those of congenital lobar emphysema, CT showed a well-defined cystic mediastinal lesion. Congenital pulmonary airway malformation appears as a multicystic intraparenchymal lesion with cysts of variable size, without a discrete mediastinal mass. CT imaging in this case did not demonstrate any aberrant systemic arterial supply or venous drainage, which makes sequestration unlikely.

The treatment of bronchogenic cysts is surgical excision in both asymptomatic and symptomatic patients because of their tendency to become infected. There are currently minimal invasive procedures, such as thoracoscopic resection, which are feasible and safe. Less invasive and temporary approaches, such as percutaneous cyst aspiration, have also been proposed but are not widely used, as cyst recurrence is possible [2].

CONCLUSION(S)

Congenital bronchogenic cysts should be considered in the differential diagnosis of infants presenting with respiratory distress and radiographic findings of hyperlucent lung fields. Advanced imaging techniques such as CT play a crucial role in diagnosing these rare anomalies and guiding management decisions. Early recognition and appropriate management are essential to prevent complications and optimise outcomes in affected infants.

REFERENCES

[1] Limaïem F, Ayadi-Kaddour A, Djilani H, Kilani T, Mezni F El. Pulmonary and mediastinal bronchogenic cysts: A clinicopathologic study of 33 cases. Lung. 2008;186(1):55-61.
[2] Sharma S, Limaiem F, Collier SA, Mlika M. Bronchogenic cyst. [Updated 2024 Nov 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK536973/.
[3] McAdams HP, Kirejczyk WM, Rosado-de-Christenson ML, Matsumoto S. Bronchogenic cyst: Imaging features with clinical and histopathologic correlation. Radiology. 2000;217(2):441-46.
[4] Vimala LR, Sathya RK, Lionel AP, Kishore JS, Navamani K. Unilateral obstructive emphysema in infancy due to mediastinal bronchogenic cyst-diagnostic challenge and management. J Clin Diagn Res. 2015;9(5):TD03-TD05. Doi: 10.7860/JCDR/2015/13463.5872. Epub 2015 May 1. PMID: 26155530; PMCID: PMC4484122.
[5] Arun S, Kumar M, Ross BJ. Mediastinal bronchogenic cyst mimicking congenital lobar emphysema. BMJ Case Rep. 2016;2016:bcr2016216704. Doi: 10.1136/bcr-2016-216704. PMID: 27609589; PMCID: PMC5020728.
[6] Singh A, Mandelia A, Kawdiya A, Naranje K, Nigam N. Evolution of antenatally diagnosed bronchogenic cyst in an infant. J Indian Assoc Pediatr Surg. 2023;28(1):66-68. Doi: 10.4103/jiaps.jiaps_87_21. Epub 2023 Jan 10. PMID: 36910298; PMCID: PMC9997589.
[7] Meshram RM, Apte M, Bhongade S. Bronchogenic cyst: A rare cause of respiratory distress in neonate - A case report. Ind J Case Rep. 2017;3(1):44-46. Available from: https://doi.org/10.32677/IJCR.2017.v03.i01.013.

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