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Case Report

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Pulmonary Sequestration a Challenge for the Pediatric Surgeon. Case report

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Abstract

Pulmonary sequestration refers to the situation where a part of the lung tissue receives its blood supply from an anomalous systemic artery. There are three main variants: intralobar, extralobar, and communicating bronchopulmonary foregut malformations. Venous drainage typically occurs through a systemic vein, although drainage into pulmonary veins is well-documented. Pulmonary sequestrations are the second most common congenital pulmonary anomaly.

Keywords: Pulmonary sequestration; Thoracotomy; Thoracic surgery; Pulmonology

Introduction and Importance

Pulmonary sequestration (PS) is a congenital condition characterized by the presence of an abnormal segment (cystic mass) of non-functional lung tissue that lacks an obvious communication with the tracheobronchial tree, and is supplied by an aberrant artery of systemic origin rather than branches of the pulmonary arterial circulation. In approximately 75% of cases, these systemic vessels arise from aberrant arteries originating from the descending thoracic aorta.

Pulmonary sequestration is classified anatomically into extralobar and intralobar types. Extralobar pulmonary sequestration (EPS) is more commonly seen in infants and children, comprising 75% of bronchopulmonary sequestration cases. In this type, there is a shared visceral pleura with the normal lung, and arterial supply tends to be higher in pressure and caliber compared to intralobar pulmonary sequestration (IPS). IPS accounts for the remaining 25% of cases in the same age group, characterized by an accessory mass of pulmonary tissue surrounded by independent pleural tissue, maintaining separation from the lung parenchyma. IPS typically has systemic arterial support, although blood vessels are often tortuous and of small caliber. Venous drainage reaches the right atrium via the azygos or hemiazygos vein, and may be associated with other congenital malformations such as diaphragmatic hernias.

Case Presentation

Female, 11 years old, with the following significant medical history: persistent bronchiolitis since birth, multiple hospitalizations for pneumonia, no prior surgeries, no reported allergies, complete immunizations (including COVID-19).

She presented with current symptoms starting 4 days prior to admission (23.02.23) including left basal hemithorax pain rated 8/10 on the pain scale

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(EVA), documented fever of 38°C which did not respond to antipyretics, and dry cough. Upon arrival at the emergency department,Vital signs within normal parameters for her age, and a chest X-ray was ordered which revealed mediastinal shift to the right and opacity in the left hemithorax with blunting of the costophrenic angle. Admission was decided due to suspected complicated pneumonia versus pulmonary sequestration, and further investigation was initiated, including a chest CT scan (Figure 1).

The patient underwent surgery for resection via thoracotomy, successfully completing left lower lobectomy through thoracotomy, with prior ligature of the aberrant vessel (Figure 2) and placement of an intrapleural tube.

Clinical Discussion

The arterial supply to pulmonary sequestrations derives 75% from aberrant arteries originating from the descending thoracic aorta, with the remaining percentage supplied by other arteries in the region, including coronary arteries or the celiac trunk. Venous return is channeled through the azygos or inferior vena cava in extralobar types, and through pulmonary veins in intralobar types. In intralobar sequestration, arteries typically have a thin muscular layer, resulting in low resistance and high blood flow, which can lead to left-to-right shunting with hemodynamic consequences.

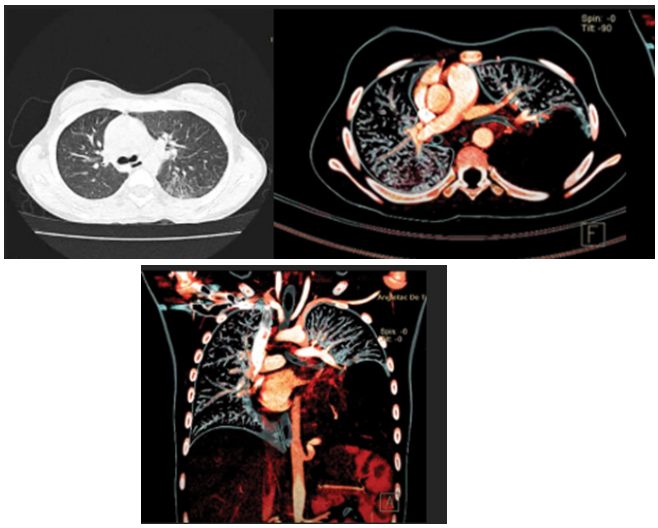

Figure 1: TAC TORAX and Angiotac shows a mass in the left base.

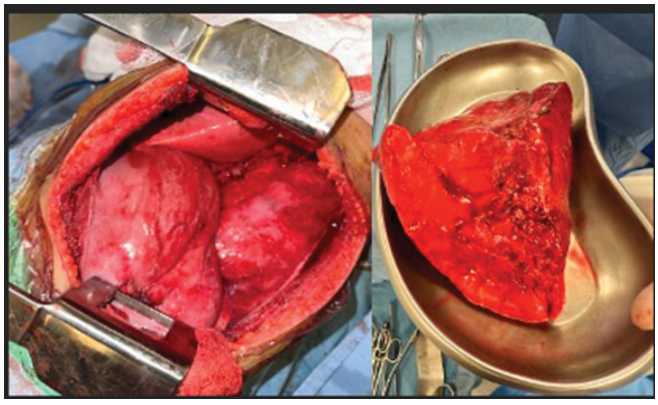

Figure 2: Left lower lobectomy

Due to these characteristics, sequestrations are masses that exert a mass effect on the adjacent normal lung parenchyma. They do not participate in gas exchange, do not contribute to dead space, but can develop left-to-right shunts.

MethodsThis case report has been reported in line with the SCARE Criteria [11].

Conclusion

Consensus treatment for sequestrations involves surgical removal, though the timing of surgery is somewhat controversial. There is a trend towards performing surgery upon confirmation of the diagnosis, due to reports of fatalities from massive hemoptysis and to prevent recurrent pneumonia and related symptoms. Surgery typically entails lobectomy via thoracotomy, although thoracoscopic approaches are also utilized. In cases where surgical risk is high, angiographic embolization of the aberrant artery can be attempted, which has proven to be a useful alternative method in children.

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Conflict of interest

The authors declare that they have no conflict of interest in the writing of this manuscript.

Ethical Considerations

Confidentiality of data: The authors state that they have followed their workplace protocols on the publication of patient data.

Protection of people and animals: The authors state that no experiments have been carried out on humans or animals for this research. Right to privacy and informed consent The authors declare that no patient data appears in this article.

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Authors contribution

Gustavo Eduardo Sanchez-Martinez: Patient care, clinical case, writing

Luis Ramón Szymański-Florencia: Patient care, Clinical case.

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References

1. Bracho M, Fernando PT, Gustavo S, et al. Secuestro pulmonar en un lactante. Revista chilena de pediatría 78 (2007): 494-499.
2. Harriet JC, Gillian ME. Pulmonary sequestration. Paediatric Respiratory Reviews 5 (2004): 59-68.
3. Cáceres-Papadakis GU, Torres-Muñoz M, Osorio-Martínez B, et al. Secuestro pulmonar como causa de dificultad respiratoria en un neonato. Rev Mex Pediatr 72 (2005): 247-249.
4. Yang L, Yang G. Extralobar pulmonary sequestration with a complication of torsion: A case report and literature review. Medicine (Baltimore) 99 (2020): e21104.
5. Michela G, Lorenzo F, Sandra A, et al. Pulmonary sequestration: What the radiologist should know, Clinical Imaging 73 (2021): 61-72.
6. Escobar F, Fuentes F, Urzúa C, et al. Malformación adenomatoidea quística pulmonar de presentación tardía: revisión del tema y presentación de un caso. Revista Chilena De Radiología 16 (2010): 190-194.
7. Yucel O, Gurkok S, Gozubuyuk A, et al. Diagnosis and surgical treatment of pulmonary sequestration. Thorac Cardiovasc Surg 56 (2008): 154-157
8. Pryce DM. Lower accessory pulmonary artery with intralobar sequestration of lung: a report of seven cases. J Pathol Bacteriol 58 (1946): 457-467.