

Rare Pediatric Pulmonary Abscess Revealed by CT Scan after Trauma: A Case Report

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Abstract

Case Report

Pulmonary abscess in children is a relatively rare disease that results from a pulmonary infection causing significant destruction of the lung parenchyma, leading to the development of a well-defined cavity with thick walls containing purulent material due to suppuration and tissue necrosis [1,2]. Imaging is the cornerstone of pulmonary abscess diagnosis. We report the case of a 6-year-old child, with no prior medical history, who was admitted to the emergency department due to progressive dyspnea for 15 days following a thoracic trauma from a fall onto a stone. The examination revealed dyspnea with signs of pleural effusion. The laboratory tests revealed an inflammatory syndrome, characterized by leukocytosis of 27970/mm³ and a CRP level of 197mg/L. Hydatid serology and HIV serology were both negative. The radiograph shows a dense, homogeneous opacity in the left lung field, which is confirmed on the CT scan as a large cystic formation with hypodense liquid content, enhancing peripherally after contrast injection. This is responsible for collapse of the ipsilateral lung parenchyma, with deviation of the mediastinal structures towards the contralateral side. On ultrasound, the lesion appears with finely echogenic content, with thick, incomplete septa, and is non-vascularized on color Doppler. Intravenous antibiotic therapy was initiated, resulting in clinical and biological improvement in the child, as confirmed by a reduction in abscess size on follow-up imaging. This case highlights the importance of prompt management and rigorous follow-up, with the use of advanced imaging, particularly CT scan, to confirm the diagnosis and guide treatment.

Keywords: Pulmonary abscess, Chest CT scan.

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INTRODUCTION

Pulmonary abscess in children is a relatively rare disease that results from a pulmonary infection causing significant destruction of the lung parenchyma, leading to the development of a well-defined cavity with thick walls containing purulent material due to suppuration and tissue necrosis [1,2]. Imaging is the cornerstone of pulmonary abscess diagnosis [3].

We report the case of a 6-year-old child in whom a giant left pulmonary abscess was incidentally revealed on a CT scan after a chest trauma.

PATIENT AND OBSERVATION

We report the case of a 6-year-old child, with no significant medical history, who was admitted to the pediatric emergency department due to progressively worsening dyspnea over a 15-day period, following a thoracic trauma sustained from a fall onto a stone. During the anamnesis, no history of animal contact was reported,

and the child had not been in endemic areas. Clinical examination revealed dyspnea, without fever or signs of respiratory distress. A pleural effusion syndrome was also noted, with no other associated signs. The laboratory tests revealed an inflammatory syndrome, characterized by leukocytosis of 27970/mm³ and a CRP level of 197mg/L. Hydatid serology and HIV serology were both negative.

A chest radiograph was performed, revealing a dense, homogeneous opacity occupying the entire left lung field.

Given this imaging and the lack of clinical improvement, a chest CT scan was performed. It revealed a large cystic formation occupying the entire left lung field, with hypodense liquid content, measuring 10 × 5.7 × 12 cm (anteroposterior × transverse × craniocaudal), with peripheral enhancement in some areas following contrast injection. This was responsible for collapse of the ipsilateral lung parenchyma, with

deviation of the mediastinal structures towards the contralateral side.

On ultrasound, the lesion appears with finely echogenic content, containing thick, incomplete septa, and is non-vascularized on color Doppler.

With intravenous antibiotic treatment, the child's condition improved, with a gradual reduction in dyspnea and pleural effusion. Laboratory results showed favorable progression, with a significant decrease in CRP levels. Follow-up radiological imaging revealed a reduction in the size of the collection, confirming the diagnosis of pulmonary abscess.



Figure 1: Frontal chest radiograph showing a dense, homogeneous opacity occupying the entire left lung field, with deviation of the mediastinal structures towards the contralateral side

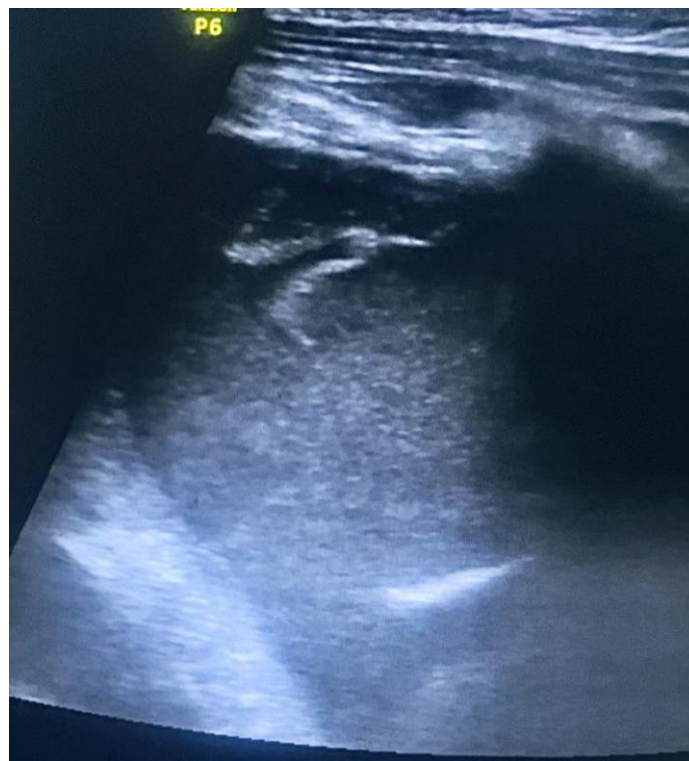


Figure 2: Chest ultrasound showing a left intra-parenchymal collection with finely echogenic, heterogeneous content and thick septa

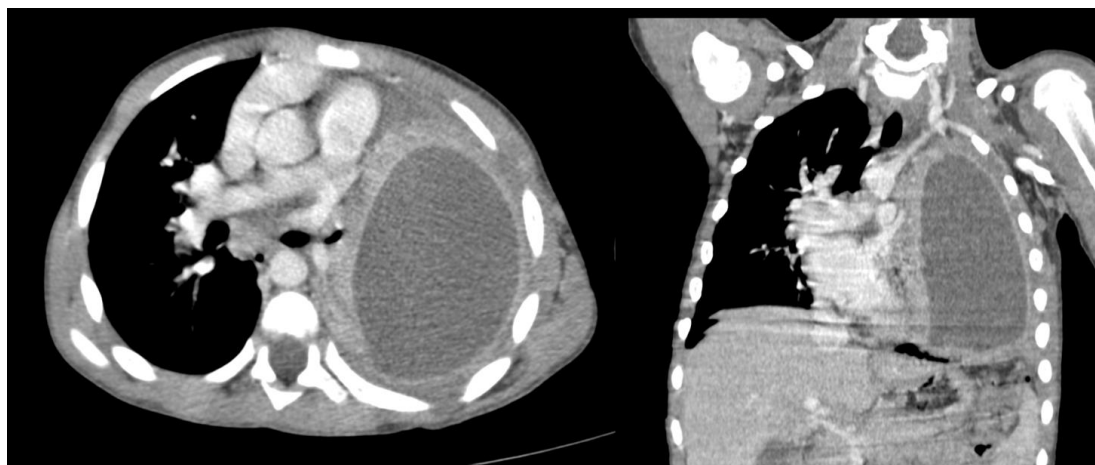


Figure 3: Axial and coronal chest CT scans showing a large formation occupying the left lung field, with hypodense liquid content and a thick wall, enhancing peripherally after contrast injection. This is responsible for collapse of the ipsilateral lung parenchyma and displacement of the mediastinal structures towards the contralateral side

DISCUSSION

Pulmonary abscesses can be classified according to several factors, including their etiology, duration, and the pathophysiological mechanism of their spread from extrapulmonary sites. Pulmonary abscesses may be acute (< 6 weeks) or chronic ($\geq$ 6 weeks) and can be either primary or secondary. Primary pulmonary abscesses occur in previously healthy children, whereas secondary abscesses can be caused by underlying local or systemic conditions, such as congenital pulmonary malformations, ciliopathies, cystic fibrosis, immune deficiencies, aspiration, or infections [3,4].

Primary pulmonary abscesses are mainly caused by *Streptococcus pneumoniae* or *Staphylococcus aureus*, while secondary pulmonary abscesses may be due to anaerobes, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Escherichia coli*, or *Klebsiella* [5].

The clinical presentation of pulmonary abscess in children varies depending on age, etiology, and the extent of pulmonary involvement. Commonly observed symptoms include high fever, productive cough, and anorexia. Chest pain, dyspnea, and hemoptysis are rare. In neonates, infants, immunocompromised patients, or those on prolonged corticosteroid therapy, fever may be absent. The diagnosis of pulmonary abscesses primarily relies on imaging, but a comprehensive diagnostic evaluation requires laboratory tests including complete blood count, inflammatory markers (CRP, fibrinogen, and procalcitonin), and bacterial cultures [3].

Chest radiography is typically the first-line examination, usually showing a well-defined opacity often containing a hydro-aeric level, with pleural effusion occasionally associated [6,7].

Chest ultrasound is effective in distinguishing pulmonary abscesses from pleural effusions or parenchymal abnormalities, particularly in the context of clinical follow-up. This examination, painless, non-invasive, and without radiation or sedation, is however limited by the presence of aerated pulmonary structures, which can induce artifacts and compromise image quality. Diagnostic accuracy is thus highly operator-dependent.

CT scan, more sensitive and specific than chest radiography, allows for highly accurate visualization of pulmonary abscesses. A giant abscess typically appears as a round or oval lesion with hypodense liquid content, often greater than 5 cm, with peripheral enhancement after contrast injection, suggesting an inflammatory wall. Thick, incomplete septa may be visible within the abscess, and adjacent pulmonary collapse is frequently observed, accompanied by deviation of the mediastinal structures. Chest CT plays a key role in identifying complications and providing additional details in cases of atypical presentations. It helps differentiate parenchymal lesions from pleural collections, identify the underlying cause of the abscess, and guide surgical decision-making and management [8,9].

Management of pulmonary abscesses involves initial broad-spectrum antibiotic therapy, targeting both anaerobic and aerobic organisms, followed by percutaneous or surgical drainage in case of persistent clinical signs or a large collection. Oxygen therapy and regular clinical and radiological monitoring are also necessary to assess progression and prevent complications.

CONCLUSION

This case illustrates that pulmonary abscess, although rare in children, can be incidentally revealed, such as after a thoracic trauma. Chest imaging with computed tomography (CT) is essential for establishing the diagnosis, assessing the extent of the lesion, and adapting the therapeutic strategy. Prompt management and rigorous follow-up led to favorable resolution of the infection.

BIBLIOGRAPHY

1. Patradoon-Ho, P.; Fitzgerald, DA Abscès pulmonaire chez l'enfant. *Paediatr. Respir. Rev.* 2007, p. 8, p. 77–84.
2. Lung Abscess Case Series and Review of the Literature. *Children* 2022, 9(7), 1047. Lamees Y. et al.
3. Diagnostic and Therapeutic Approach in Pediatric Pulmonary Abscess: Two Cases and Literature Review. *J. Clin. Med.* 2024, 13(24), 7790; Mariana Costin et al.
4. Logistic regression analysis of clinical and computed tomography features of pulmonary abscesses and risk factors for pulmonary abscess-related empyema. *Clinics (Sao Paulo)*. 2019 Apr 2;74:e700. Xing-Dong Cai et al.
5. A 10-year retrospective review of pediatric lung abscesses from a single center. *Annals of Thoracic Medicine* 11(3):p 191-196, Jul–Sep 2016. Madhani K. *et al.*,
6. Interventional radiology of the chest: Image-guided percutaneous drainage of pleural effusions, lung abscess, and pneumothorax. *Am. J. Roentgenol.* 1995, 164, 581–588. JS Klein et al.
7. Decreasing Exposure to Radiation, Surgical Risk, and Costs for Pediatric Complicated Pneumonia: A Guideline Evaluation. *Hosp. Pediatr.* 2017, 7, 287–293. RD Quick et al.
8. Cystic and Cavitory Lung Lesions in Children: Radiologic Findings with Pathologic Correlation. *J. Clin. Imaging Sci.* 2013, 3, 60. K. Odev et al.
9. Pulmonary Abscess: Imaging Features and Diagnosis. *Radiologic Clinics of North America*, 54(6), 1011-1023. Levin, D. C., & Goldstein, H. (2016).