World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

A bronchial foreign body leading to multifocal brain abscesses: A case report

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World Journal of Advanced Research and Reviews, 2025, 26(03), 724-728

Publication history: Received on 25 April 2025; revised on 01 June 2025; accepted on 04 June 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.26.3.2177

Abstract

Background: Brain abscesses represent a diagnostic and therapeutic challenge. Their clinical presentation is often in the form of a single abscess. Multiple cerebral abscesses are very rare in pediatrics.

Case Description: We report the case of a 12-year-old child admitted for febrile conscience disorder, the brain imaging revealed multiple bilateral cerebral abscesses. The etiological work-up highlighted the presence of a bronchial foreign body responsible for cerebral abscesses by hematogenous dissemination. This case illustrates the rarity of multiple cerebral abscesses in children, and suggests an unusual link with pneumopathy secondary to inhalation of a foreign body.

Conclusion: Multiple brain abscesses are rare in children and require essential surgical and antibiotic management. Although frequently associated with ENT or cardiac infections, this case illustrates a rare association with foreign body aspiration.

Keywords: Infant; Drainage; Brain; Abscesses

1. Introduction

Brain abscess in children is a neurosurgical emergency with potentially catastrophic outcome despite the advances made in neuroimaging techniques and antibiotic therapy. [1] Brain abscess still poses a public health challenge, especially in developing countries. [2] Foreign-body aspiration is an extremely rare cause of brain abscess, [3] they are the fourth most common paediatric exposure reported to the American Association of Poison Control Centers, [4] they are a significant cause of morbidity and mortality in the paediatric population. [5]

We report a case of a 12 years old boy admitted with fever and loss of consciousness with a right hemiparesis revealing multiples brain abscesses. the diagnosis was established by neuroimaging, especially magnetic resonance imaging (MRI).

2. Case report

A 12-year-old male patient was admitted for febrile altered consciousness associated with seizure and right-side body weakness for the past two weeks, put on probabilistic antibiotics without clinical improvement. His past medical history includes a confirmed foreign body aspiration four years ago, associated with mild hemoptysis dating back two years. Neurological examination revealed a meningeal syndrome with positive Kernig's and Brudzinski's sign, 4/5 right hemiparesis without any sensory deficit associated to the ataxia and fever around 38 °C.

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The biological assessment revealed an elevated white blood cells with 13,490/mm^3 (Neutrophils 8,903/mm^3) and a moderately elevated C- Reactive Protein of 12 mg/L. Also, the brain CT showed Multiple hypodense lesions surrounded by an isodense halo enhanced after contrast agent injection (Figure 1). Moreover, MRI examination showed 27 round lesions Hypointense in T1 surrounded by an isointense halo intensely enhanced after injection of Gadolinium, hyperintense in T2 with restricted diffusion (Figure 2).

Etiological investigations included, Transthoracic echocardiography, which revealed no signs of infective endocarditis or cardiac malformations. the ENT examination, sinus X-rays and dental panoramic views were normal. In view of the history of Foreign-body aspiration in 2020 a chest X-ray and a thoracic CT scan were performed, which showed a foreign body in the right lower lobar bronchus complicated by pneumonia (Figure 3).

The management was based on empirical broad-spectrum antibiotic therapy combining ceftriaxone, metronidazole and vancomycin. The patient also underwent surgical drainage of the largest abscess revealing cloudy contents, but the cytobacteriological examination was sterile (the patient was on antibiotics before his admission). Bronchoscopy was performed to remove an unidentified foreign body.

The clinical course under treatment was favorable, with resolution of the fever and progressive neurological improvement. On discharge, the patient was apyretic, without meningeal syndrome or signs of intracranial hypertension, and his motor deficit improved progressively with rehabilitation.

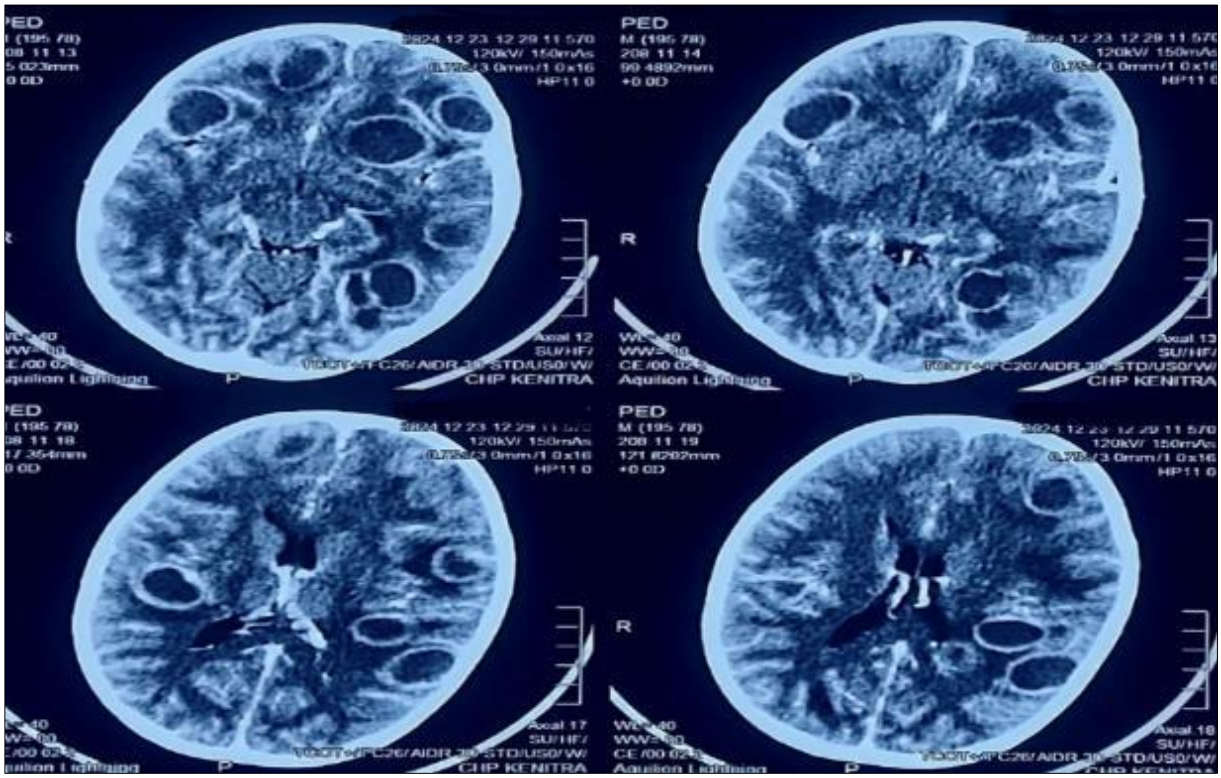

Figure 1 Axial post-contrast CT scan images demonstrate multiple ring-enhancing lesions consistent with multiple abscesses

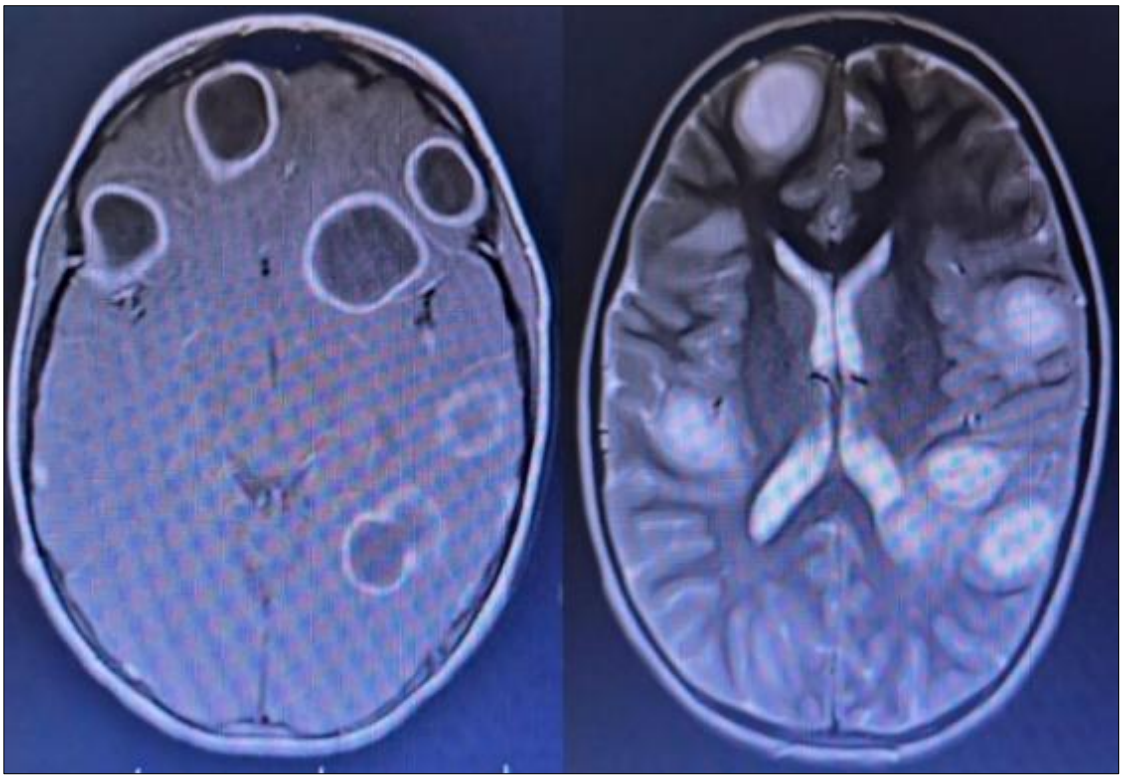

Figure 2 Axial brain MRI showing multiple cerebral abscesses, hypointense in T1 enhanced peripherally, hyperintense in T2

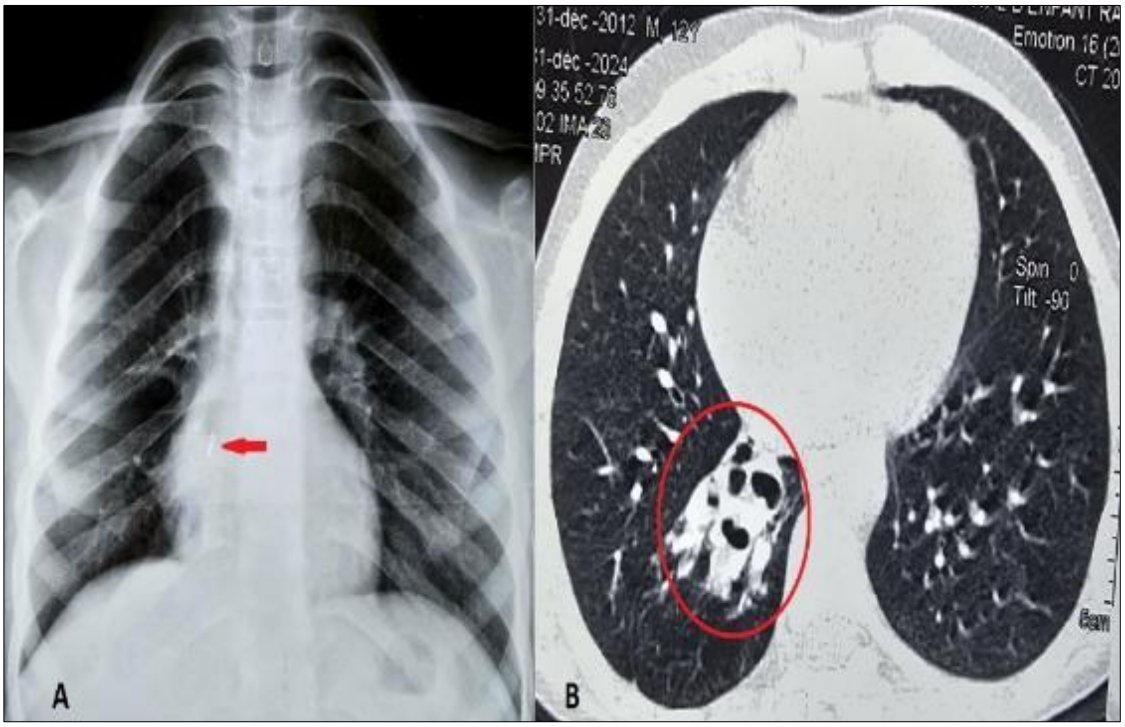

Figure 3 A chest X-ray and CT scan showed a foreign body in the right lower lobar bronchus (arrow), complicated by pneumonia (circle)

3. Discussion

Brain abscess is a focal pyogenic infection of the brain's parenchyma [6] surrounded by a capsule with fibroblasts and neovascularization, [7] it can be caused by various microorganisms which potentially resulting in a life-threatening condition [8]

Several case reports detailing airway foreign bodies leading to brain abscess have been described in children aged 2 to 5 years and one child aged 10 years with similar outcomes. Aspirated foreign bodies included seeds (e.g., watermelon and sunflower), needles, and safety pins/push pins [9].

Clinical presentation of brain abscess is usually similar to other intracranial space-occupying lesions. However , the symptoms of an abscess tend to be more rapidly progressive than those associated with a neoplasm. [10] Absence of fever should not be used to exclude the diagnosis of brain abscess because this sign is detected in approximately one-half of affected children [11]

Foreign body aspiration is commonly associated with acute respiratory symptoms and signs, however episodes of aspiration often go unwitnessed and can be asymptomatic. [5] In patients who have a subacute history of cough, gagging, vomiting, and decreased oral intake with an otherwise unknown cause, foreign-body ingestion or aspiration should be considered. [4]

The probable mechanism of the relation between foreign-body aspiration and brain abscess development is based on the assumption that a bronchial foreign body can penetrate the mucosal barrier of the bronchial tree leading to focal damage to the protective pulmonary capillary filter, which in turn can result in brain abscess development. Foreign-body aspiration should be suspected in children with a brain abscess. Fibreoptic bronchoscopy should be considered in the evaluation of a brain abscess of unknown aetiology. [12] Abscess can appear months to years after the precipitating event. [6]

A combination of broad-spectrum or organism-specific antimicrobial therapy and surgical drainage is the preferred therapeutic method in most cases. Antimicrobial therapy alone is used for small-sized lesions usually <2.5 cm, multiple abscesses, and deep-seated lesions [13]. Cases treated in this manner may require a more prolonged duration of treatment and close clinical and radiographic follow-up. [11] A 6- to 8-week course of parenteral antibiotics has been recommended traditionally; many authorities recommend 2 to 3 months of additional oral antimicrobial therapy to prevent relapses. [14] Needle aspiration is as effective as is excision in the management of most purulent collections within the brain [15]. Earlier detection and removal of foreign bodies are essential to preventing subsequent complications. [4]

We have opted for a combination of antibacterial therapy targeting gran-negative bacilli, anaerobes and streptococcus for 6 weeks of intravenous treatment with biopsy of the most voluminous cerebral abscesses, which is in line with the recommendations and provides a good clinical and biological response.

Repeat CT and MRI imaging eventually will show a decrease in the size of the abscess, disappearance of surrounding edema, and lessening of the enhancement ring. These improvements usually are observed within 1 to 4 weeks of management, but complete radiographic resolution often extends to several months of follow-up. [16]

4. Conclusion

Multiple brain abscesses are rare and are a diagnostic and therapeutic emergency. This diagnosis should be considered in patients with a history of foreign body inhalation and with neurological signs associated with fever. The treatment is based primarily on appropriate antibiotic therapy, combined with surgical drainage where necessary.

Compliance with ethical standards

Disclosure of conflict of interest

The authors do have not any conflicts of interest in this case report and any financial resources.

Statement of ethical approval

Ethical approval was obtained.

Statement of informed consent

Informed consent and verbal permission were obtained from the patient before the submission of this article. In addition, this article follows both the Consensus-based Clinical Case Reporting Guideline and the Recommendations for the Conducting, Reporting, Editing, and Publication of Scholarly Work in Medical Journals.

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