

Delayed Radiological Changes in a Patient With Inhaled Foreign Bodies: A Case Report

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Abstract: Foreign body aspiration (FBA) and aspiration pneumonia are uncommon but potentially lethal events in adults. Airway obstruction by aspirated food or other material can lead to hypoxaemia and delayed radiological changes. International reporting standards emphasise structured, transparent case reports to improve completeness and utility. **Case Presentation:** A 55-year-old man with a history of recurrent strokes and dementia developed sudden dyspnoea and altered consciousness during a meal. Initial vital signs showed oxygen saturation of 77% on room air, blood pressure 190/100 mm Hg, and a Glasgow Coma Scale score of 5/15. Following resuscitation and high-flow oxygen, his oxygen saturation improved. The first chest radiograph was normal. Ten hours later, the radiograph remained unremarkable. Eighteen hours after presentation, a third radiograph demonstrated right middle- and lower-lobe atelectasis. Emergency bronchoscopy under local anaesthesia revealed obstructing food particles ("roti") in the right lower lobar bronchus, which were removed. Post-procedure imaging showed re-expansion of the collapsed lobes. The patient was observed for 30 hours, regained baseline neurological status, and was discharged with outpatient follow-up. **Conclusion:** This case highlights that initial chest radiographs may be normal following aspiration events. Delayed radiological changes warrant repeat imaging when clinical suspicion of FBA persists. Prompt bronchoscopic removal of the foreign body is critical for preventing complications, consistent with current recommendations(2). Adhering to established reporting guidelines enhances the value of case reports for clinicians and researchers.

Keywords: foreign body aspiration, aspiration pneumonia, bronchoscopic removal, delayed radiological changes, case report

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Introduction

Case reports remain an important source of clinical information and may inspire hypotheses for further study; however, their quality varies widely. The Case Report (CARE) guidelines were developed through a consensus process to improve the completeness and transparency of case reporting. The guidelines recommend inclusion of specific items—title, keywords, abstract, introduction, patient information, clinical findings, timeline, diagnostic assessment, therapeutic interventions, outcomes, discussion, patient perspective, and informed consent—and emphasise providing a timeline of events. Reporting the patient's perspective and documenting informed consent are also considered essential (1).

Aspiration pneumonia results from inhalation of oropharyngeal secretions, food, liquids, or gastric contents into the lower airways. A prospective study of 95 patients found that gram-negative bacilli accounted for almost half of infections, whereas anaerobes accounted for 16%; common anaerobic genera included *Fusobacterium*, *Bacteroides*, and *Peptostreptococcus* (2). Risk factors for aspiration include altered mental status, cerebrovascular disease, esophageal dysmotility, dementia, and poor mobility (3,4).

Foreign body aspiration is rare in adults—approximately 0.16–0.33% of bronchoscopic procedures (5). However, an aspirated object can cause fatal airway obstruction ("café coronary") with an estimated incidence of 0.66 per 100,000 population (6). Timely intervention is imperative; if an obstruction is not promptly relieved, the patient may die or sustain hypoxic brain injury (2). Flexible bronchoscopy is the preferred diagnostic and therapeutic modality for removal of aspirated foreign bodies (7).

We report a case of delayed radiological changes following aspiration of food in an adult, emphasising the importance of repeat imaging, timely

bronchoscopy, and structured reporting according to international standards.

Patient Information

Demographics

The patient was a 55-year-old man with long-standing diabetes mellitus and hypertension, poorly controlled due to inconsistent follow-up. He had been bedridden for several years following recurrent ischaemic strokes and had advanced dementia. There was no known family history of pulmonary disease. He did not smoke, drink alcohol, or use illicit drugs.

Presentation and History

The patient was eating dinner when family members witnessed a choking episode followed by sudden shortness of breath and progressive obtundation. Emergency medical services found him drowsy and unresponsive (Glasgow Coma Scale 5/15) with oxygen saturation 77 % on room air, blood pressure 190/100 mm Hg, and random blood glucose of 333 mg/dL. There was no fever, cough, or haemoptysis. His history included recurrent strokes, dementia, hypertension, and diabetes. Medications included antihypertensives and insulin; compliance was uncertain. He had been receiving oral feeds with no prior aspiration events.

Clinical Findings

Initial assessment revealed a drowsy, unarousable patient with tachypnoea. Lung auscultation showed decreased breath sounds at the right lower lung field and fine inspiratory crackles throughout the left lung. The oral cavity was clear of obvious foreign material. The patient's mental status limited neurological examination but showed no focal deficits beyond his baseline hemiparesis. No peripheral oedema was noted.





Fig. 1 First Chest X-ray done on presentation. Grossly Normal

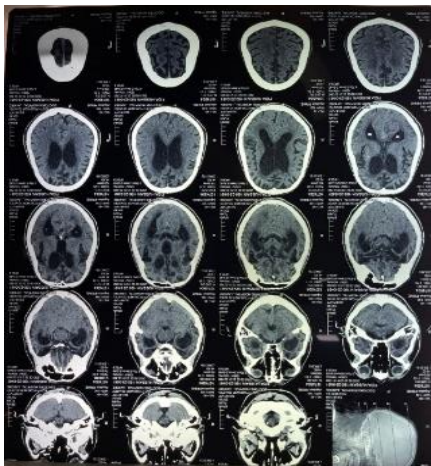


Fig 2 CT Scan Brain showing Old Ischemic Changes and Senile Atrophic Changes.

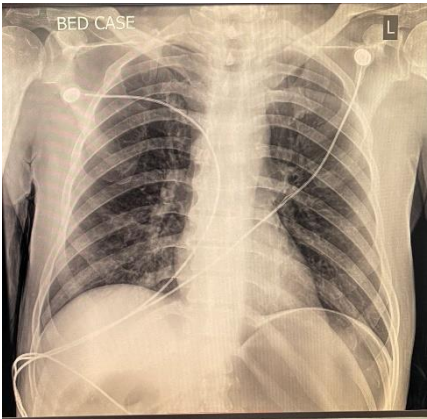


Fig. 3 Second Chest X-Ray done after 10 hours of presentation. No significant changes yet.

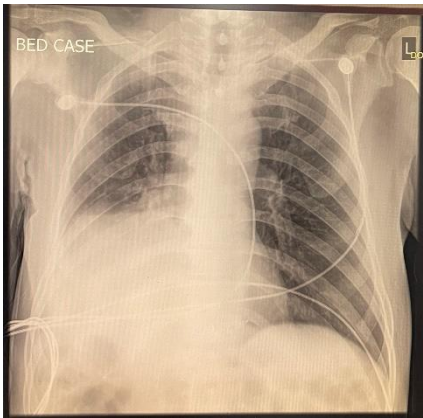


Fig. 4 Third Chest X-Ray done after 18 hours of presentation. Collapsed Right Middle and Lower Lobe.

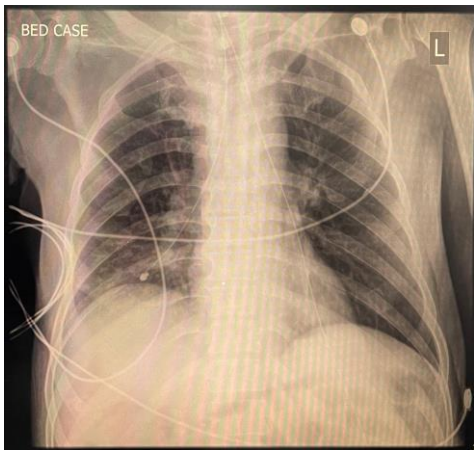


Fig 5 Post Bronchoscopy Chest X-Ray done. Collapsed part now open.

Timeline

Time from presentation Event	
0 h	Patient choked while eating; developed dyspnoea and decreased consciousness. Initial vital signs: SpO ₂ 77 % (room air), BP 190/100 mm Hg, GCS 5/15. High-flow oxygen administered and blood work sent; baseline chest radiograph normal.
0–10 h	Supportive care with non-rebreather mask and non-invasive ventilation; empiric antibiotics, inhaled bronchodilators, and intravenous corticosteroids initiated for suspected aspiration pneumonia. Neurological assessment and computed tomography (CT) of the brain demonstrated chronic ischaemic changes. Repeat chest radiograph at 10 h showed no abnormality.
10–18 h	The patient's respiratory status deteriorated despite bi-level positive airway pressure; repeat blood gas showed worsening hypercapnic acidosis. The family declined invasive ventilation. At 18 h, a third chest radiograph revealed collapse of the right middle and lower lobes.

18 h	Bedside ultrasound excluded pneumothorax. Emergency flexible bronchoscopy under local anaesthesia demonstrated obstructing food particles ("roti") in the distal trachea and right lower lobar bronchus. The fragments were removed with grasping forceps; the airway was lavaged and aspirated.
18–30 h	After bronchoscopy, the patient's oxygen requirements decreased, and he was weaned to facemask oxygen. Post-procedure radiograph showed re-expansion of the right lung. Over the next 30 hours, he regained full consciousness, was able to maintain oxygen saturation on room air, and resumed oral intake.
30 h	The patient was discharged from the intensive care unit with instructions for continued follow-up with pulmonology and neurology.

Diagnostic Assessment

Initial laboratory studies revealed hyperglycaemia and mild leucocytosis. Arterial blood gases showed respiratory acidosis (pH 7.317, pCO₂ 52.8 mm Hg, pO₂ 78.5 mm Hg, HCO₃⁻ 23.9 mmol/L). A follow-up gas prior to bronchoscopy demonstrated worsening acidosis with pH 7.130, pCO₂ 80.4 mm Hg, and HCO₃⁻ 20.6 mmol/L. Chest radiographs at presentation and 10 h showed no infiltrate or opacification. The radiograph at 18 h demonstrated complete collapse of the right middle and lower lobes. Lung ultrasound ruled out pneumothorax. CT brain revealed chronic ischaemic infarcts and ventricular dilation consistent with previous strokes. Flexible bronchoscopy identified and removed the obstructing food particles.

Microbiological cultures from bronchoalveolar lavage were negative for bacterial growth.

Therapeutic Interventions

The patient received high-flow oxygen, empirical broad-spectrum antibiotics, and intravenous corticosteroids for suspected aspiration pneumonia upon arrival. Non-invasive ventilation was initiated when respiratory acidosis worsened. After the family declined endotracheal intubation, continuous monitoring and supportive care were continued. Upon discovery of right-sided atelectasis at 18 h, an emergent flexible bronchoscopy under local anaesthesia was performed. Multiple food fragments were removed from the right main and lower lobar bronchus using grasping forceps; lavage was performed until the bronchi were clear. Post-procedure, non-invasive ventilation was continued briefly and then weaned to facemask oxygen. No additional antibiotics were added.

Follow-up and Outcomes

Following bronchoscopic removal of the foreign body, the patient's respiratory status improved dramatically. Oxygen requirements declined, and arterial blood gases normalised. A post-procedure chest radiograph showed re-expansion of the right lung. Over the next 30 hours, the patient became alert and oriented to baseline and resumed oral feeding without difficulty. He was transferred out of the intensive care unit and discharged home with instructions to follow up with pulmonology and neurology. At follow-up, the patient remained asymptomatic, and no recurrence of aspiration was reported. His family received education regarding aspiration precautions, including supervised feeding and dietary modifications.

Discussion

Aspiration pneumonia remains a common and serious complication in patients with impaired protective airway reflexes. Risk factors include advanced age, neurological impairment (stroke, dementia, Parkinson's disease), esophageal dysmotility, and bedridden status (3,4). The aspirated material can be oropharyngeal secretions, food particles, or gastric contents. Although *Streptococci* and *Haemophilus* species are common causes of community-acquired pneumonia, a prospective study of 95 patients with aspiration pneumonia found that gram-negative bacilli accounted for 49% of infections, whereas anaerobes accounted for 16%; *Fusobacterium*, *Bacteroides*, and *Peptostreptococcus* species were frequent anaerobic isolates (2). These data support the use of broad-spectrum antibiotics targeting gram-negative and anaerobic organisms when aspiration pneumonia is suspected.

Foreign body aspiration in adults is uncommon, representing about 0.16–0.33% of all bronchoscopic procedures (5). In adults, FBA may occur in patients with neurological disease, alcoholism, sedative use, or dental procedures. Clinical manifestations vary; patients may present with

choking, cough, dyspnoea, or wheezing, but symptoms can also mimic chronic obstructive pulmonary disease or pneumonia, delaying diagnosis. Timely removal of the foreign body is essential because complete airway obstruction can cause death or hypoxic brain injury (2,6). The incidence of fatal café coronary (asphyxiation due to food) is estimated at 0.66 deaths per 100,000 people (6).

In our case, the initial chest radiographs were normal despite a high clinical suspicion of aspiration, likely because the aspirated food particles partially occluded the right main bronchus but did not completely obstruct distal airways. As time progressed, the fragments migrated distally, resulting in complete obstruction and collapse of the right middle and lower lobes. This course underscores the need for serial imaging when clinical findings (e.g., unilateral decreased breath sounds) persist despite initial negative radiographs. Multi-detector CT and bronchoscopy have higher diagnostic accuracy for FBA (5,7), but were deferred initially in our patient due to haemodynamic instability and family preferences. Once radiological evidence of collapse became apparent, prompt bronchoscopy allowed removal of the obstruction and prevented complications such as pneumonia, bronchiectasis, or lung abscess. The case also illustrates the ethical dimension of patient autonomy; the family declined invasive ventilation, necessitating careful communication and shared decision-making.

Conclusion

This case underscores the critical importance of maintaining a high index of suspicion for foreign body aspiration in high-risk adult patients, especially when initial radiographic findings are unremarkable. In patients with neurological impairments, a normal chest X-ray does not rule out airway obstruction, and clinical deterioration should prompt repeat imaging and early consideration of bronchoscopy. Prompt diagnosis and intervention, even when delayed radiological changes are present, can significantly improve outcomes. Our patient's recovery following a timely bronchoscopy highlights the life-saving role of early endoscopic airway clearance in suspected aspiration events. Regular follow-up with multidisciplinary care remains essential to prevent recurrence and address underlying risk factors.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC--24)

Consent for publication

Approved

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The authors declared the absence of a conflict of interest.

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Conception of Study, Development of Research Methodology Design,

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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