

## Bronchial Foreign Body Mimicking Chronic Cough and Recurrent Bronchopneumonia: Diagnostic Dilemma in a Resource Poor Setting

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### ABSTRACT

Foreign body (FB) in the lower airway could pose a life-threatening emergency. Occasionally, small objects in the airway may present insidiously. High index of suspicion is required to avoid delayed or missed diagnosis of foreign body with its attendant complications. A Six-year-old male admitted through the Children Emergency Room (CHER) with 6 months history of recurrent cough and fever associated with choking spells and noisy breathing, and a day history of shortness of breath. Child was said to have “swallowed” a plastic object in the course of the illness, which the care givers and attending physicians assumed had been passed out in faeces. He was managed as a case of recurrent bronchopneumonia with oral and parenteral medications with temporary relief of symptoms. Chest x-ray done at presentation showed evidence of left lung collapse with ipsilateral mediastinal shift. He had a diagnostic rigid bronchoscopy and a plastic object was discovered within the left main bronchus and subsequently retrieved. Broad spectrum antibiotics, anti-inflammatory and antipyretics were administered and by the second day post-op, all chest symptoms had resolved, and repeat chest x-ray showed normal findings. We recommend that any child with a history of recurrent cough and shortness of breath that is unresponsive to medical treatment qualifies for otolaryngological review to rule out bronchial FB via diagnostic bronchoscopy; Chest Radiograph may help support diagnosis but should not be used alone to exclude it.

**Keywords:** Aspiration, Airway, Bronchopneumonia, Radiograph, Bronchoscopy

### INTRODUCTION

A foreign body (FB) lodged in the lower airway could be life-threatening.<sup>1,2,3</sup> Children are more commonly affected; adult literature is scarce.<sup>4,5,6,7</sup> It occurs when they spontaneously inspire while playing or fighting with an object in their mouth. Children aged 1-3 years chew incompletely with their incisors prior to eruption of molar teeth, and objects or fragments may propel backwards, eliciting reflex inhalation.<sup>1,3,8,9,10</sup> In adults, foreign bodies can be aspirated in coma, deep sleep or alcoholic intoxication, as well as adults with psychiatric or neurological disorders. Loose denture may be aspirated during anaesthesia.<sup>4,5,11</sup>

Before the age of 15 years, foreign bodies that migrate beyond the trachea

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could be lodged in either the right or left bronchus with equal frequency. Adults however, have a more acute angle of the right major bronchus, which is a relatively straight extension of the trachea; thus, objects that descend beyond the trachea are more frequently lodged in the right bronchus.<sup>4,8,12,13,14</sup>

An aspirated object may lodge in the larynx, trachea, or bronchi; the location of the foreign body depends on its size, shape, and composition.<sup>7,12,13,14</sup> If the object is large enough to completely block the airway, asphyxia can swiftly result in death. Unless the object is dislodged, respiratory distress, aphonia, cyanosis, loss of consciousness and death occur in rapid succession. This is referred to as a "café Coronary" syndrome. Less severe and subtle symptoms can result from lower degrees of obstruction or transit of the object beyond the carina.<sup>5,9,13</sup> When a FB is hygroscopic or large, there could be neither ingress nor egress of air and may result into lung collapse. If infection sets in, consolidation may subsequently ensue.<sup>13,15</sup>

Vegetable FB may swell over hours or days, worsening the obstruction. Cough, wheeze, stridor, dyspnea, cyanosis, and even asphyxia might ensue.<sup>4,11</sup> They induce local inflammation, oedema, cellular infiltration, ulceration, granulation tissue formation and hence worsening obstruction, further making bronchoscopic identification and retrieval more difficult. However, an inert FB has limited ability to elicit local inflammation, could stay longer and less likely to cause complications.<sup>9,11,16,17</sup> We hereby report a case presenting with chronic cough which was initially misdiagnosed to highlight the need for a high index of suspicion.

## CASE REPORT

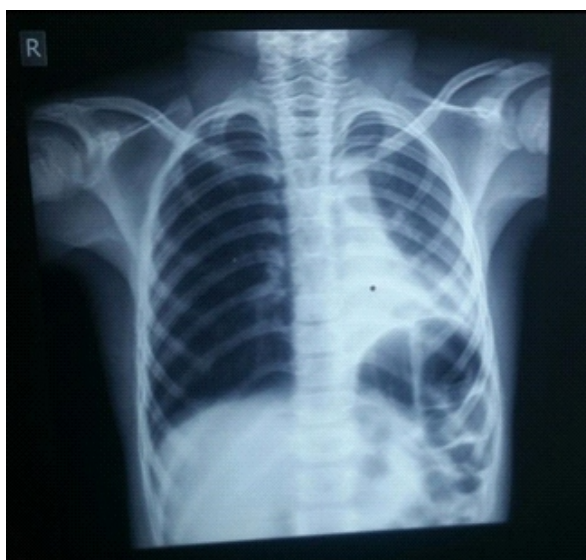
Patient is a 6-year-old male, who was admitted via children emergency room (CHER) with 6 months history of recurrent episodes of cough, shortness of breath and fever. Child reported to the mother that he accidentally "swallowed" a pen cover but subsequently retracted following persistent scolding

by the mother. Cough was sudden in onset, initially dry and non-paroxysmal, but later became productive of whitish sputum, with choking spells, said to disturb patient's sleep at night, there was noisy breathing but no loss of voice and no odynophagia nor dysphagia. Child developed recurrent fever which was high grade, intermittent and worse during the day. Child was given over the counter medications procured from patent medicine dealers but symptoms persisted. They subsequently presented twice to a peripheral hospital where he was managed as a case of recurrent bronchopneumonia. He was given parenteral and oral medications with temporary relief of symptoms. Caregivers were then erroneously reassured and sent home, saying that if he had actually "swallowed" an object, he would have passed it out, though chest X-ray showed features suggesting pneumonic changes but no visible foreign body was identified. A proper referral for an otolaryngological review was not made. With the persistence of symptoms, the child was taken to a second peripheral hospital, where a CT scan was requested. This also showed only pneumonic changes on the left lung field without any clear delineation of foreign body. He was treated and discharged home on oral medications. About a week prior to presentation, blood-stained sputum was noticed anytime patient coughed. This persisted for 5 days. A day prior to presentation, child developed fast breathing, usually post tussive, with bluish discoloration of the lips, necessitating presentation at our facility, a tertiary hospital which is approximately 65km away from the rural setting where they reside.

At presentation, the child was febrile (38°C) and in respiratory distress (flaring ala nasi, intercostal/subcostal recession, respiratory rate was 52 cycles/minute, pulse rate was 146 beats/minute and oxygen saturation was 56% on room air). He had significant cervical and submandibular lymphadenopathy. Chest examination showed reduced chest excursion on the left lower lung zone with reduced tactile fremitus, vocal resonance, as well as reduced breath sounds on left middle and lower lung zones, with coarse crepitations. The right chest was

essentially normal on examination. He was observed to have intermittent exacerbations with episodes of cough, fast breathing and hypoxia occurring spontaneously, worse at night and relieved by intake of nebulized salbutamol and intravenous steroids. Chest radiograph (Figure-1) showed upward displacement of left hemi-diaphragm, volume loss

**Figure 1:** Pre-operative plain chest radiograph showing evidence of left-sided lung collapse with ipsilateral mediastinal shift and elevated left hemi-diaphragm, no obvious foreign body was observed.



**Figure 2:** Foreign body retrieved from the left main bronchus (A plastic pen cover)



on the left hemi-thorax with ipsilateral crowding of pulmonary vessels and mediastinal shift; no foreign body was seen on the radiograph.

The patient was placed on broad-spectrum antibiotics, antipyretics and anti-inflammatory drugs for 72hrs and subsequently worked up for a diagnostic rigid bronchoscopy. A red plastic object (Figure 2) was discovered within the left main bronchus with surrounding mucosal oedema and lots of secretions. The object was subsequently retrieved, and the secretions were suctioned.

A day after extraction, cough, fever and respiratory distress had resolved, and child was found playing around with peers in the ward. Repeat chest x-ray (Figure 3) done on the second post-operative day showed that the left sided lung collapse had also resolved, and patient was subsequently discharged home on oral medications. He was seen a week later at the clinic with no complaints and chest, as well as other physical examinations findings were normal.

**Figure 3:** Repeat chest radiograph done 2 days post-extraction showing resolved left sided lung collapse and centralisation of the mediastinum.



## DISCUSSION

Foreign body aspiration usually presents as an acute emergency with cough, choking spells and dyspnea. Depending on the nature, shape and size, symptoms may subsequently abate and become relatively indolent especially for inert FBs as seen in our patient or progressively worsened in the case of vegetable FBs which absorb moisture, swell and subsequently secrete pro-inflammatory substances that induce local and systemic reactions.<sup>4,9,11,17,18</sup> Sudden onset of the classic triad- cough, wheezing and reduced breath sound is usually diagnostic until otherwise proven.<sup>13,19,20</sup>

Older children or an eye-witnesses may give account of what happened. However, in younger children, suggestive symptoms and presence of remnant FBs in the patients mouth or immediate surrounding should raise suspicion. In the index patient, child initially gave a suggestive history but subsequently retracted after he was scolded by parents and the history was easily discarded. Care givers kept on procuring over the counter medications from patent medicine dealers to treat the recurrent cough which often relieved temporarily but recurred few days later. They subsequently sought care from two other private hospitals where patient was managed as a case of recurrent bronchopneumonia. Airway FB was dismissed as none was visible on chest radiograph and since child admitted initially “swallowing” an object, they assumed that he would have passed it out in faeces. Also, the prevailing COVID-19 pandemic during this period may have influenced the superficial management of the patient.

A positive history of FB is a strong factor that should not be easily dismissed without exploring further in any child with persistent respiratory symptoms. Also, airway FB must be ruled out in every child with unexplained recurrent pneumonia. Hilliard *et al* presented three cases of bronchial FBs with delayed diagnosis ranging from few days to several weeks and some of the reasons cited in their report included normal/ misleading radiographic findings,

misdiagnosis of bronchial asthma and pneumonia etc.<sup>21</sup> It was believed that the delay could have been averted with more careful approach to history and physical examination, as well as more appropriate use of investigations. Sultan *et al* and Samor *et al* demonstrated in independent studies that up to 50% of cases of airway FBs could have normal chest radiograph findings and thus misleading.<sup>6,22</sup> Studies in other parts of the world has also collaborated these findings.<sup>13,23,24</sup> Chest radiograph has poor sensitivity in the diagnosis of airway FBs as most of them are not radio-opaque, it can however show secondary features like pneumonic changes, adaptive emphysema, atelectasis, and bronchiectasis,<sup>13,24</sup> All of which should give us a guide. CT scan and Magnetic Resonance Imaging (MRI) may offer some additional benefits in the diagnosis of lower airway foreign bodies, however bronchoscopy remains the gold-standard in the diagnosis and management of tracheobronchial foreign bodies<sup>25</sup> as clearly demonstrated in the index case where the CT scan showed only features of pneumonic changes.

## CONCLUSION

Any child with cough and shortness of breath recalcitrant to medical treatment is indicated for otolaryngological review, and FB in the tracheo-bronchial tree must be ruled out via diagnostic bronchoscopy. Early proper referral of the above case would have prevented the wasted resources and time, increased hospital stay, loss of work/ school time and the ensued morbidity. Radiological investigations may help to confirm the presence of FB but should not be used alone to exclude it; “we must go-in and look”.

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