

## Foreign Body Aspiration in Children – A Case Series

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### ABSTRACT:

**Introduction:** Foreign body aspiration (FBA) in children typically presents with persistent or recurrent cough. This issue is seen mostly among the toddlers and preschoolers due to active pincer grasp and mouthing reflex. Incidence is more in males probably due to the nature to explore the surroundings. Other common symptom associated with FBA are breathing difficulty.

The problem is making an early diagnosis wherein the sharp clinical acumen, high index of suspicion is needed by the treating pediatrician because history may not be elicited in many situations.<sup>1,2</sup>

Some of the clues can be absence of fever in an acute accidental event, and sudden onset of symptoms like cough and breathing difficulty.<sup>2,3</sup> Other signs developed could be due to the site of impaction in the respiratory tract like stridor.

An accurate examination picking up the decreased or absent air entry on the affected Side can help to arrive at a quick diagnosis.

Diagnosis is aided by typical features of obstructive emphysema, collapse or mediastinal shift seen on a chest radiograph<sup>2,3</sup>. In some cases clinical features will not be peculiar as seen above. Or else in some instances the duration of symptoms may not be acute.

Also in some cases of delayed presentations or small radiolucent foreign bodies chest x-ray may show subtle signs rather than those mentioned above<sup>4,5</sup>. In such cases many patients are diagnosed late or undergo many higher investigations like chest Tomography (CT) ending up bearing radiation exposure and also the cost.

A pediatrician can sometimes be misled by such delayed or complicated presentations of foreign body aspiration.<sup>6</sup> Here we discuss some of these cases which can help in timely diagnosing FBA in children.

**Keywords:** Foreign Body Aspiration, Chest X-Ray, Flexible Bronchoscopy, Rigid Bronchoscopy.

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### Case 1: Persistent cough

8 years male child was brought by mother with complaints of cough on and off since four weeks.

This child appeared to be well nourished and there was no history of any coughing patient in the family. There was no history of any environmental fumes exposure,

Recurrent fever, or weight loss in the recent past.

No evidence of recurrent wheezing or asthma in the family. But the mother was very particular about the coughing since four weeks. This child also received symptomatic treatment from three general practitioners during this period without any improvement in the cough.

On examination this child had Heart rate (HR)-88/min, respiratory rate (RR)-26/min blood pressure (BP)-110/72 mm of Hg and saturation

of 94%. Rest of the general Examination was normal and the respiratory system examination revealed normal inspection and palpatory findings apart from a mild decrease in air entry in the right lung which was not conspicuous hence probably missed by earlier practitioner.

In the absence of any clinical clues we decided to investigate this child in our tertiary care center with complete blood picture and chest radiograph posterior-anterior (PA) view. The CBP was in normal limits (HB-116G/L, TC- $5 \times 10^9$ /L, DC – N-68%, L-30%, PCV-0.34L/L, RBC- $4.89 \times 10^{12}$ /L PLT- $240 \times 10^9$ /L MCH 31 Pg MCV-72fL, MCHC-316g/L) and x-ray as shown below in figure 1 showing subtle hyperinflation and haze.

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Initially we labelled this child as to have habit cough and counselled about the benign nature of the entity to the mother. But the child was noticed to cough even in the night.

Hence we decide to do flexible bronchoscopy in this child which revealed a small broken piece of groundnut in the right lung. This was later on removed by rigid bronchoscopy on the same day. Child was shifted to ward and required nebulization with salbutamol and parenteral antibiotic for a week before we could discharge him. This child was followed up in outpatient department after 2 weeks and 6 weeks and found to be asymptomatic.

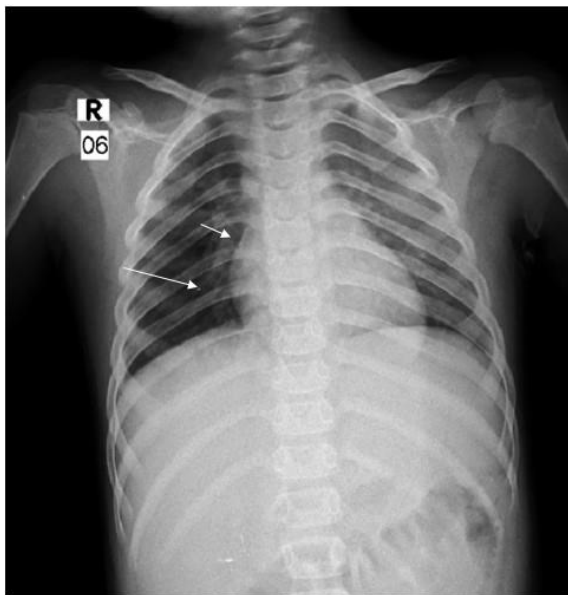


Figure 1: Mild haze (short arrow) and hyperinflation (long arrow) in right lung.

### Case 2: Pyrexia of unknown origin

7 years male child presented to our outpatient department with complaints of fever on and off since two months. This child was treated by many general practitioners in rural areas who treated him with multiple courses of oral antibiotics with symptom free intervals of two to three days in between but undocumented. The fever was mild to moderate in severity, intermittent, subsided with paracetamol, not associated with chills, rigors or rash. There was no history of common cold, vomiting, and loose stools. No history of headache, dyspnea, dysuria, joint pains. There was no significant past or family history of any illness. On examination he appeared to be normal built child with good

nutrition and his vitals were Temperature- 101 degrees of Fahrenheit, HR-130/min RR-32/min BP-98/74mm of hg SPO2-94%. Systemic examination was normal apart from mild decrease in air entry to right side. In the absence of any clue preliminary Investigations in the form of complete Blood Picture, urine routine, and chest x-ray P-A view, CRP, ESR and blood culture were done.



Figure 2: Mild haziness in right lung in the middle and lower lobe

CBP (HB-116 G/L, TC- $12 \times 10^9$ /L, DC – N-68%, L-30%, PCV-0.34L/L, RBC- $4.99 \times 10^{12}$ /L PLT- $250 \times 10^9$ /L MCH 30 Pg MCV-70fL, MCHC-306g/L). The child was admitted for Observation. Blood culture did not show any growth. CRP was 8 mg/L, Dengue serology was Negative. The child continued to spike fever even after normal initial Investigations. After admission parenteral empirical antibiotics were started and 2-DEchocardiography was done to rule out any vegetation over valves or coronary dilatation, even if inflammatory markers like CRP and ESR were normal to rule out Kawasaki or FIRES which were seen commonly in the Post-covid pandemic. Even after giving parenteral Antibiotics to this child for 72 hours fever continued to spike. Abdominal sonogram was also normal. There was no focus from preliminary investigations. In view of mild decrease in air entry in right lung

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we did one more x-ray that revealed mild haziness in right lung in the middle and lower lobe. During this stay the child was visited by many relatives and other family Members of the house. Coincidentally we obtained a history of choking episode when this Child was eating a tamarind seed 2 months before, from his grandmother who had come to see her grandson. This was a clue for cause of fever and we decided to go for flexible bronchoscopy of this Child which revealed a small broken piece of tamarind seed with debris around it in the lower Bronchus. This foreign body was retrieved with rigid Bronchoscopy.

This child was afebrile after 48 more hours of retrieval of foreign body.

He was given antibiotics for three more days and discharged. Later he was followed up in the Outpatient department and was asymptomatic.

### Case 3: Air leaks

An 8-month-old male infant presented with noisy breathing after having cough for two weeks. These symptoms partially responded to treatment with antibiotics and cough syrups, which were prescribed by general practitioners in rural areas. On admission infant had breathlessness and cough and needed admission to the pediatric intensive care unit.

On examination child was afebrile, HR-170/min, RR-66/min, BP-76/38 mm of Hg. Spo<sub>2</sub>-90% requiring nasal prongs. Noisy breathing was heard. General physical examination was showing swelling in neck and axilla. There was crepitus over these swollen areas.

Systemic examination showed normal inspection and palpation but on auscultation the air entry was reduced on the Right side. CBP was (HB116G/L, TC-5×10<sup>9</sup>/L, DC: N68%, L30%, PCV-0.34L/L, RBC-4.89 ×10<sup>12</sup>/L PLT-240×10<sup>9</sup>/L MCH 31 Pg MCV-72fL, MCHC-316g/L)

Normal and the initial chest radiograph showed mediastinal widening and Subcutaneous



Figure 3a: Pneumomediastinum and bilateral subcutaneous emphysema

Emphysema (with an artefact seen over the spine). There was no apparent cause for pneumomediastinum and noisy breathing (which was stridor). This child was initially stabilized in picu and one more radiograph was done. In the Subsequent radiograph the artefact appeared to be a pin-like foreign body. So this child after initial stabilization was posted for immediate fiberoptic bronchoscopy which revealed the pin obstructed in the right main bronchus. This was removed by rigid laryngoscopy soon after Fiberoptic bronchoscopy. Subcutaneous emphysema was managed conservatively over following 4 days of observation. The child was treated with prophylactic antibiotics and nebulization with bronchodilators until fifth day when he was asymptomatic and accepting feeds hence discharged. Subcutaneous emphysema and pneumomediastinum with the pin (Which could be missed as artefact due to superimposition on the thoracic spine) at carina became clear in the subsequent image figure 3b after it slid towards right bronchus.

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Figure 3b: Pin shown by white arrow.



Figure 3c: Figure 3c shows the Pin after it was removed.

### Discussion:

Foreign body aspiration in children is a frequently handled problem by all the pediatricians. Sometimes it can lead to emergency or life threatening situation especially when it occurs in infants and preschoolers and is unnoticed by parents.

Some instances on the other hand can present as subacute or chronic illness particularly if they produce subtle pointers in initial investigations like complete blood picture and chest radiograph<sup>4</sup>. It is more frequently seen in males<sup>3</sup>

Organic material like peanuts, tamarind seeds are commonly seen instead of inorganic<sup>2</sup> material like pins, ball- pen caps. Organic foreign bodies are prone to produce inflammation

And fever like symptoms particularly if retained for longer duration.<sup>5</sup> Such foreign bodies may pose difficulty in diagnosis and hence delay in treatment.

Other problems are many a times these foreign bodies could be fragmented and at many locations.<sup>6,7</sup> hence it is rewarding and crucial to repeat x-ray particularly in case of FBA.

In some scenarios the examination may produce very minimal or no signs and diagnosis cannot be made particularly if history is not obtained from all the members involved in the care of the child or if choking event was unnoticed by any adult.<sup>2,5</sup>

Hence pediatricians can end up advising chest tomography in such children.

CT scan though non-invasive but exposes the child to ionizing radiations and can be negative in cases of radiolucent foreign bodies. Although low dose CT scans are considered sensitive and specific for detecting FBA in children yet the risk of exposure precludes its widespread use in doubtful cases.<sup>8</sup>

In many situations there is temporal discrepancy between clinical features and initial Chest x-ray, which could delay the diagnosis until the treating pediatrician has a high index of suspicion and diagnostic bronchoscopy is done. Here ultra-low- dose CT scan can be considered<sup>9</sup>. But some studies have shown that a normal CT chest does not rule out FBA<sup>10</sup>

Hence Flexible bronchoscopy is gold standard for diagnosis and more rewarding where history of FBA is not obtained or accidental aspiration occurs<sup>11</sup>. It would be worthwhile to have flexible Bronchoscopy as an office Procedure. There has been growing evidence towards use of Flexible Bronchoscopy not Only for diagnosis but also for therapeutic use over rigid Bronchoscopy<sup>12,13</sup>. Although Many Factors like the location, size, duration of symptoms, local Pathology and Otorhinologist Preference may play role in the choice of the bronchoscopy used for the removal of foreign Body.<sup>14,15</sup>

Abbreviations: Foreign body aspiration- FBA,  
Chest Tomography- CT Chest  
Chest radiograph- chest x-ray.

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Conflict of interest: NIL

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