

# Multiple Intrabronchial Foreign Bodies in Children: Report of Three Cases

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## Abstract

In this study, three pediatric cases of foreign body aspiration are presented. They all presented with severe respiratory symptoms and rigid bronchoscopy was performed to evaluate the endobronchial tree. All of them had more than one foreign body in their bronchial tree. Two of them recovered after bronchoscopy and one recovered after surgery for the

complications of foreign body aspiration. Foreign body aspiration should be considered in patients with severe distress and careful bronchoscopic examination should be carried out.

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Intrabronchial foreign body (FB) aspiration is a common and hazardous problem in childhood. It is a significant cause of childhood morbidity and mortality. In USA, it has been reported that 2000 deaths per year occur due to FB aspirations (1). Most of the patients are less than three years old and aspiration generally occurs as a result of natural curiosity of a toddler (2).

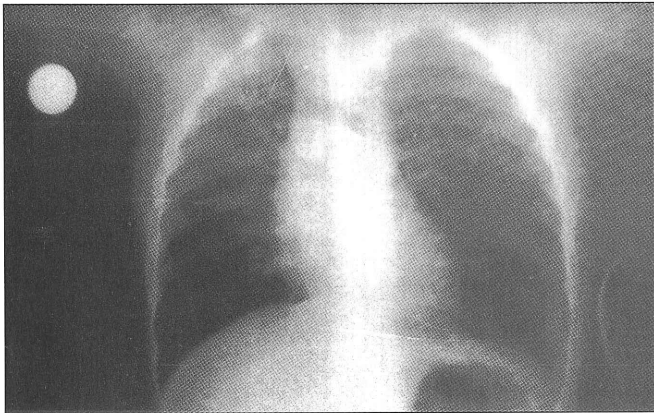
Foreign body aspirations are also common in Turkey, as a result of highly consumed pumpkinseeds, hazelnuts and peanuts (3). Out of a total of 199 pediatric rigid bronchoscopies which were performed between 1994 and 1998 for FB aspirations, three of the cases were found to have multiple foreign bodies in their bronchoscopic examination. Due to originality in their presentation and outcome, we present these cases to discuss the possible consequences of the pediatric FB body aspirations.

## Case 1:

A 2-year-old boy was admitted with respiratory distress and wheezing which has been continuing for three days. He had a history of cyanosis while he was eating pumpkinseed. The patient has been treated as having an upper respiratory tract infection by a private physician. His chest x-ray revealed bilateral lower zone hyperventilation (Figure 1). Initially, the foreign body was thought to be in the left main bronchus. Rigid bronchoscopy was performed under general anesthesia. A pumpkinseed was removed from the left

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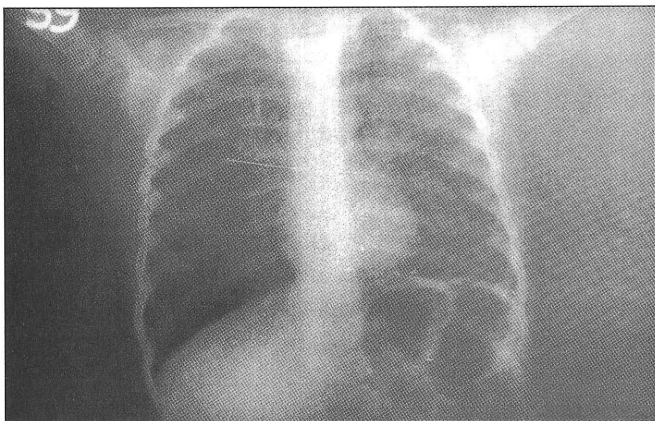
lower lobe bronchus. As the right bronchial system was investigated, another pumpkinseed located in left main trunk was noticed and removed. The postoperative period was uneventful and the child was discharged on postoperative day three to be treated with oral antibiotics.



**Fig. 1. A.** Significant hyperventilation is seen in both of the lower zones on the chest x-ray. In the initial evaluation of the patient, the foreign body was thought to be on the left side as the hyperaeration is more marked on that side. But two separate pumpkinseeds were removed from both main stem bronchi.

### Case 2:

A 20-month-old boy was admitted with severe respiratory distress, cyanosis and intercostal retractions. He had a history of FB aspiration (piece of carrot) three months ago. He was experiencing respiratory problems for the last three months and was treated symptomatically in a rural town. His chest x-ray revealed right-sided hyperaeration (Figure 2). Rigid bronchoscopy was performed under general anesthesia. During bronchoscopy right main bronchus was occluded with purulent material. When the purulent secretions were aspirated, a



**Fig. 2.** In this child only marked hyperaeration is observed on the right side. A piece of nut was removed from the right main bronchus and a pumpkinseed was removed from the left lower lobe bronchus.

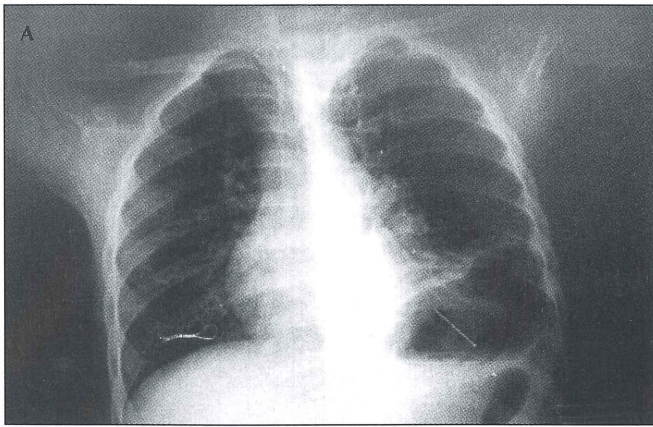
piece of nut was found, nearly occluding the whole lumen of the right main bronchus. After it was removed, the left bronchial system was investigated and an unexpected pumpkinseed was found on the left lower lobe bronchus. After bronchoscopy, the family noted that he coughed and became cyanotic one week ago when he was eating nuts. No history existed for the pumpkinseed. The postoperative period was uneventful and the child was discharged on postoperative day four to be treated with oral antibiotics.

### Case 3:

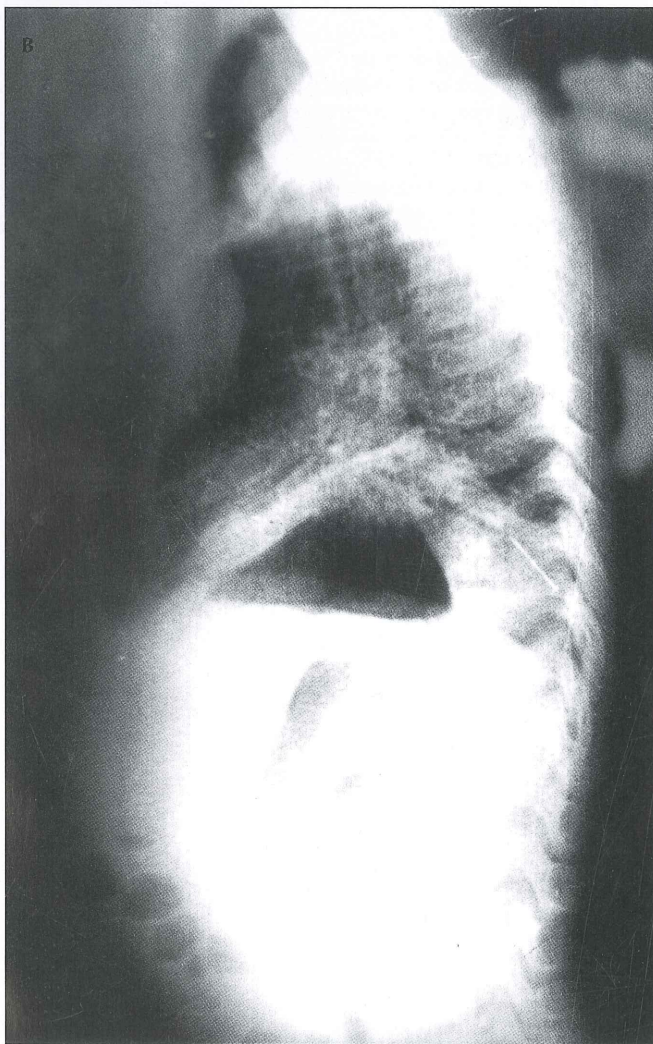
A 2-year-old girl was admitted with cough, wheezing and respiratory distress. She has aspirated a pin six months ago and she was misdiagnosed as having the pin in her stomach. She has undergone surgery (laparotomy) for removal of the pin, but the intervention was unsuccessful. Her diaphragm was also transected during this surgery in search for the pin. On her chest x-ray and fluoroscopic examinations the pin was located in posterior segment of the lower lobe and left lower lobe was thought to be atelectatic (Figure 3A and 3B). Rigid bronchoscopy was performed under general anesthesia. Right bronchial system was opened and in the left lower lobe bronchus granulation tissue was observed. The pin was not seen endoscopically, so under fluoroscopy the pin was grasped and taken out in two pieces. It was rusted and rotten due to its long stay in the lung tissue. The granulation tissue was dissected and a pumpkinseed was seen in the left main lower lobe bronchus. The pumpkinseed was removed and the postoperative period was uneventful. The child was discharged on postoperative day four to be treated with oral antibiotics. She was called for a control bronchoscopy two weeks later. Purulent secretions in the left lower lobe were detected during the control bronchoscopy. She was further evaluated for her diaphragmatic function and a diaphragmatic hernia was detected with fluoroscopy. She has undergone left lower lobectomy and diaphragmatic plication and was well after two years of follow-up.

### Discussion

Retained and neglected FBs in the respiratory tract in children are a common occurrence. In children, this is a major cause of death and most of the victims are under age four (1). It has been reported that in two thirds of the cases with airway FBs the diagnosis was not made within one week after aspiration, and in 17% of the cases the diagnosis was not made for 30 days or more (4).



**Fig. 3. A.** Posteroanterior chest x-ray. The pin is noted on the left side. It was misinterpreted as being in the stomach and she was operated on.



**Fig. 3. B.** Left lateral chest x-ray. The pin was in the posterior segment of the lower lobe. Left lower lobe was also thought to be atelectatic. A pumpkinseed was removed from the left lower lobe bronchus along with the pin.

Undiagnosed FBs can cause mechanical effects, chemical reactions, and may present as chronic pulmonary infection, bronchiectasis, asthma, lung collapse, or lung

abscess (2). We have carried out an experimental study in rabbits and put a piece of peanut into their main bronchi and observed those bronchiectatic changes began after four weeks of FB retention (5). That's why early diagnosis of an aspirated foreign body is essential, and delay in treatment may be dangerous and even fatal. It has been reported that the incidence of major complications arising from a delay in diagnosis was 64 % in children who were diagnosed within 4 to 7 days; however, the complication rate was 70 % in the cases with a delay in diagnosis of 15 to 30 days and 95 % in the cases with a delay in diagnosis of over 30 days (2).

Inhalation of a FB is usually accompanied by a bout of vigorous cough that should arouse a suspicion. However, in many instances, this acute episode of coughing was not witnessed by the parents, or was disregarded, and FB aspiration was not considered, until much later. Even in absence of a typical history, the diagnosis should be considered when the onset of wheezing and other symptoms is sudden, especially when there is no history of previous attacks and when chest roentgenograms indicate either collapse or hyperinflation of the lung. According to most of the series, roentgenographic evidence can provide clues to the diagnosis in over 80% of the cases (6).

When evidence of obstruction is present, and in children with unresolving inflammatory process in the lung, bronchoscopy should be performed without delay (4). Rigid bronchoscopy under general anesthesia is undoubtedly the instrument of choice (6-7). Generally dissection of granulation tissue is complicated with hemorrhage which is much easier to manage with rigid bronchoscopy. While performing bronchoscopy, it should be remembered that a FB that is not impacted, can move from one site to another, and if it is not found at the expected location, thorough examination of the entire bronchial tree is mandatory. Thoroughness and attention to details will minimize the incidence of missed FBs. Firm impaction of the FB may prevent its removal at bronchoscopy. When this occurs, thoracotomy and operative extraction of the FB becomes necessary. Whenever possible, this should be done through a bronchotomy, with preservation of the pulmonary parenchyma. However, when a FB has remained impacted for a long time and irreversible and destructive changes have occurred in the lung tissue beyond the area of obstruction, pulmonary resection is indicated. This was necessary in one of our patients.

To overcome the problems in diagnosis of FB aspiration, parents should be educated about taking care of their

children by not leaving materials around that could be easily aspirated and physicians practicing in rural areas and private clinics could be informed on the possible consequences and outcomes of a long lasting intrabronchial FB (7-10).

Our policy for the patients with suspected FB aspiration is to perform rigid bronchoscopy under general anaesthesia, and then observe the patient for a couple of days in the ward. These patients are then referred to the pediatric pulmonology department and followed up.

It is surprising to meet multiple foreign bodies in one child, but it is obvious that this is even possible and careful bronchoscopic evaluation should be done in every case with suspected foreign body aspiration, especially if the clinical condition of the patient is critical.

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