

# LED-A Rare Case of Foreign Body Aspiration-A Case Report

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**Abstract:** An 8-month child presenting with acute onset of cough and noisy breathing to the EMD. On evaluation the baby appears to be in stridor with drooling of saliva and features of cyanosis. Urgent chest X-ray AP view (figure 1) showed a pin like structure in the laryngeal area. We performed an urgent rigid bronchoscopy and the foreign body turned out to be a light-emitting diode (LED) bulb. We hereby, report our experience of LED bulb aspiration in children, with an aim to raise the awareness of clinicians about this potentially life-threatening emergency presenting in the ER

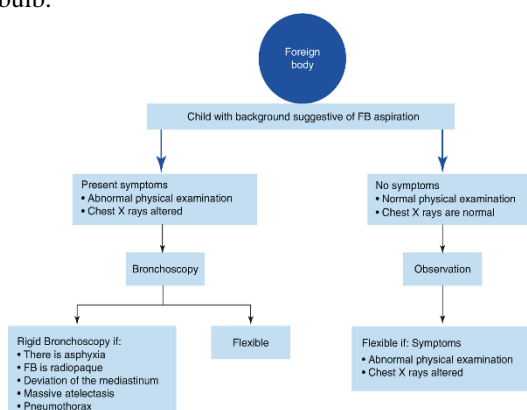
**Keywords:** LED, Foreign Body, Aspiration, Rigid Bronchoscopy

## 1. Introduction

Children commonly aspirate foreign bodies (coins, pins, button batteries etc). Foreign body aspiration is said to be a major cause of death in children as it causes airway obstruction in turn causing difficulty in ventilation. Peak incidence of foreign body ingestion is in 6months-3yrs [1]. Of all the recorded cases deaths, foreign body aspiration is responsible for 7% of all accidental deaths in younger children of age more than 4 years [2]. Laryngeal foreign bodies are rare as they usually pass through the larynx. In this case report we highlight the diagnostic and therapeutic challenges one can face in the removal of Light emitting diode (LED) bulbs as well as their characteristic appearances in radiographic films.

## 2. Case Report

We report an 8-month child presenting with acute onset of cough and noisy breathing to the EMD. On evaluation the baby appears to be in stridor with drooling of saliva and features of cyanosis. Bilateral air entry was reduced but maintains saturation of 98% on 6lts O<sub>2</sub> support. Parents give a history of the child last seen playing mouthing a diode light bulb.



**Figure 1:** Approach to Foreign body aspiration

## 3. Intervention

- Immediately taken on o<sub>2</sub> support.
- Stat doses of IV Dexamethasone 0.1mg/kg along with Adrenaline and Budecort Nebulisation.
- Urgent chest X-ray AP view (figure 2) showed a pin like structure in the laryngeal area. Lateral view could not be taken.
- Plan for Emergency Bronchoscopy with sos intubation in the EMD operation theatre.

## 4. Challenges

- The wiring of the LED bulb may get splayed and may get embedded into the mucosal wall.
- Easy Displacement of the LED distally
- Proximal airway oedema may create ratchet airway
- Paediatric emergency



**Figure 2**

## 5. Procedure

After adequate preparation of patient and checking bronchoscope. During such emergency situations, it is required to keep one size larger and one size smaller than the estimated one. We should always be prepared with a

tracheostomy set, ready for emergency purpose. Patient was induced under inhalational anaesthesia. Check laryngoscopy confirmed position of LED bulb in the laryngeal inlet. IV sedatives were given by the anaesthesia team and Rigid Bronchoscopy (figure 3) was done to remove the LED bulb (figure 4).

Suctioning of intraluminal secretion was before the end of the procedure performed until clear and luminal patency confirmed. Patient was then given General anaesthesia and intubated in view of airway oedema (figure 5) and was shifted to the Paediatric ICU for further management. Postoperatively, the patient was extubated after 24hrs of ventilatory support. The patient recovered well and required daily chest physiotherapy, and was discharged home 2 days later with a 2-week course of Oral Augmentin.

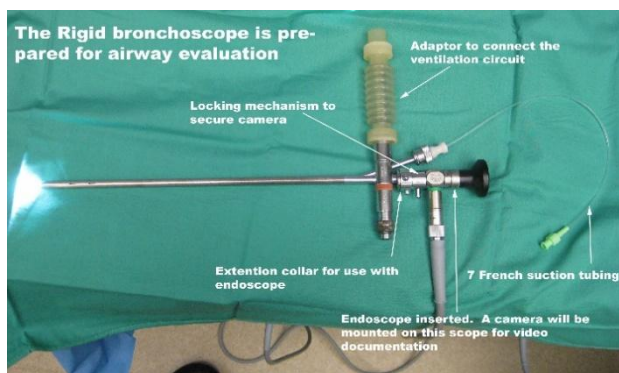


Figure 3

## 6. Discussion

Foreign body aspiration can be a serious respiratory emergency requiring immediate medical attention. In children younger than 3 years old, almost up to 7% of deaths were accounted because of foreign body aspiration. Thus, making it one of the leading causes of all sudden deaths in toddlers. [4, 5]. The classic triad of presentation is cough/choking episodes, unilateral wheeze/rhonchi and diminished air entry in one side of lung. Few patients presented in emergency care with severe respiratory distress and features of cyanosis. Common presentations as found in this study are history of choking (100%), diminished air entry in one lung (59%), wheeze/added sound (49%), cough (25%) and respiratory distress (19%), blow whistle (3.8%). In 1994, Black et al. described symptom triad—coughing, choking and wheeze in up to 91% of patients presented with FBA. [11] Prompt diagnosis is considered vital, as any kind of delay may result in mortality as well as increase the risk of other complications. A previous study in 1999 by Baharloo et al [6] revealed that up to 80% of paediatric patients suffering from foreign body aspiration were seen to be younger than 3 years of age. Patients of the age group between 6 months and 3 years are particularly at risk because they have a strong propensity to put objects into their mouth [1].

Types of F.B.	Vegetables	Whistle	Small plastic parts	Small metallic parts	Jewellery	Safety pins	LED	Miscellaneous
Numbers	26(35%)	15(20%)	12(16%)	10(14%)	2(3%)	3(4%)	2(3%)	4(5%)

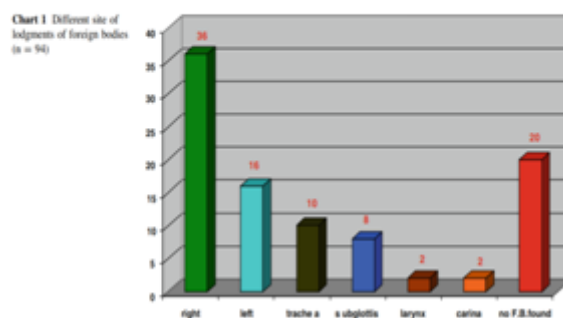
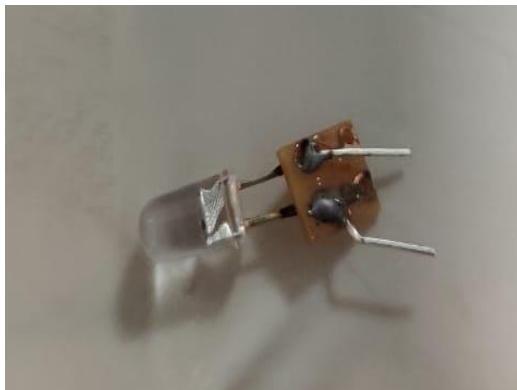
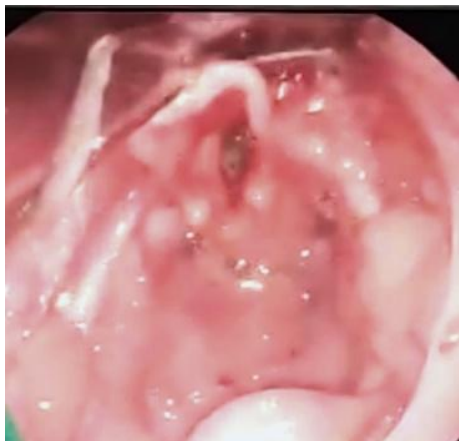


Chart 1: Incidence of Types of FB

The difficulty in getting a proper and detailed history from these groups of patients with occasional the absence of symptoms makes these conditions easily overlooked and may even miss the diagnosis. Even in the presence of caretakers, only few 2/3<sup>rd</sup> of patients was actually witnessed ingesting a foreign body, as observed in a previous study, [7] and identifying the type of object aspirated may be misleading due to recall bias. Most frequently aspirated objects are the Organic food substances, followed by plastic and metal parts from toys. [8] Rigid bronchoscopy under general anaesthesia is considered to be the gold standard diagnostic and therapeutic procedure for FBA. LED bulbs are a rare cause for tracheobronchial aspiration and only two such documented cases have been previously reported in the literature. [9] In recent years of industrialization, LED bulbs have gained exponential popularity in the toy industry due to their numerous physical advantages over older technology, including much improved energy efficiency, low heat generation, long life span and shock resistance. Still, most of the studies till date only focused on the optical safety of LEDs. [10] With the increasing utilization of LED bulbs in all sorts of commercial products, the potential incidence of their aspiration should not be underestimated and clinicians should often consider and bear this in mind. The chest X-ray features can also be confusing to most of the clinicians, since the plastic component of the LED bulb is radiolucent, thus, allowing the bulb to mimic a purely metal wire, with its ball valve effect underrated. All the bronchoscopies were done by a well-equipped and well-trained team consisting of an experienced anaesthesiologist and surgeon. Very good co-ordination between the anaesthesiologist and the surgeon is a must. The procedure was done under general anaesthesia with a ventilating bronchoscope. Post operative managements are minimal in most of the successful cases. Intravenous fluids, steroids and antibiotic are usually prescribed for 1–2 days, and then changed to oral medications. Nebulization with bronchodilators and steroids control oedema and help rapid recovery before discharging them. Foreign body aspiration in children remains a diagnostic challenge for most of the clinicians. One must bear a high index of suspicion in patients suspected of the condition. Medical health workers should be aware of the rare possibility of LED bulb aspiration.



**Figure 4:** LED bulb (foreign body) after removal



**Figure 5**

## 7. Conclusion

Foreign body aspiration of LED bulb is a rare entity. In a series of 94 case studies of foreign body aspiration in India, only 2 cases were LED bulbs, which suggests an incidence of 2% (chart 1).<sup>[3,9]</sup> Foreign body aspiration in children still remains a diagnostic challenge for most of the clinicians. Detailed history is considered to be the most important factor for diagnosis. Roentgenography is not considered as a reliable method for diagnosis of FBA. Bronchoscopy is considered mandatory and should be done whenever foreign body is suspected in the airway. Caution should be taken to prevent slippage of the foreign body distally into the trachea. Chemical composition and pointed edges of the LED bulb may also pose special problems. Management of a foreign body in the airway is a discipline unto itself. Cases should be referred to a highly specialized tertiary centre with sophisticated setup for timely management.

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