

### The wandering Pencap amidst Covid Era

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### Abstract

**Introduction:** Aspiration of Foreign body into the airways commonly seen in the children and continues to be a cause of morbidity and mortality. It requires a prompt diagnosis and early intervention to reduce potentially lethal consequences.

**Clinical Case:** Presenting a case of 7-year-old, healthy boy came with history of accidental ingestion of pen cap during online class who underwent multiple attempts to extract via Rigid and flexible Bronchoscope which failed following which successfully retrieved through Right lateral Thoracotomy. Post operatively child developed fever spikes, cough and shortness of breath. On examination had tachypnoea which was evaluated.

Covid-19cbnaat was positive for which he was shifted to isolation and medically managed with good recovery.

**Discussion:** Physicians should always consider foreign body aspiration diagnosis with high index of suspicion

when children present with typical symptoms like coughing, wheezing, shortness of breath or cyanosis. Amidst COVID era with similar Symptom complex diagnosis of foreign body aspiration should not be neglected. Open surgical procedures including thoracotomy and bronchotomy for retrieval of impacted bronchial foreign body are invaluable adjunctive procedures for management of complicated foreign body aspirations with the help of good surgical team.

**Conclusion:** Timely intervention with experienced surgical and ICU team will minimize the mortality and complication rates associated with aspirations. Multidisciplinary team consisting of surgeons, anesthetist, pulmonologist, radiologist and pediatric intensive care unit holds for the good outcome of the patient. While performing emergency procedures like bronchoscopy, personal protective measures are to be

strictly taken in view of high aerosol exposure in relation to COVID -19 infections.

**Keywords:** Foreign body aspiration, Covid ERA.

### Introduction

Aspiration of Foreign body into the airways commonly seen in the children and continues to be a cause of morbidity and mortality (1). It requires a prompt diagnosis and early intervention to reduce potentially lethal consequences. Exploring nature and the child's inquisitiveness commonly attributes to Foreign Body aspiration. Most foreign bodies are retrieved using a Rigid or flexible Bronchoscope. Occasionally retrieval becomes unsuccessful or in case of difficult foreign body wherein Emergency Thoracotomy is performed to salvage the situation and repair the airway (2). In this Covid-19 pandemic with similar symptom presentation Bronchoscopy should be performed at the earliest opportunity when there is high suspicion of foreign body aspiration under all necessary protective precautions. Open surgical procedures including thoracotomy and bronchotomy for retrieval of impacted bronchial foreign body are invaluable adjunctive procedure for management of complicated aspirations with the help of a good surgical team.

### Aim

To present an unusual case of accidental foreign body aspiration in a child and case specific clinical presentation and surgical management in Sri Ramachandra Institute of Higher Education and Research.

### Case

7-year-old, healthy boy came with complaints of mild cough, increased work of breathing and left sided chest pain to the OPD after accidental ingestion of foreign body (plastic pen cap) 24 hours before.

On examination, child was tachycardic and tachypneic with falling oxygen saturation 94-85% and reduced air entry to the left side of chest. Child was started on high flow oxygen and Covid-19 cartridge based nucleic amplification test (CBNAAT) swab was taken.

Xray Chest PA view(a) taken revealed Collapsed left lung with no obvious foreign body. Contrast enhanced Computed tomography of Thorax (b) taken showed obstruction in the left main bronchus causing collapse of left upper and lower lobes. Hyperdense Focus was seen in the superior segmental bronchus of left lower lobe – suspected foreign body.

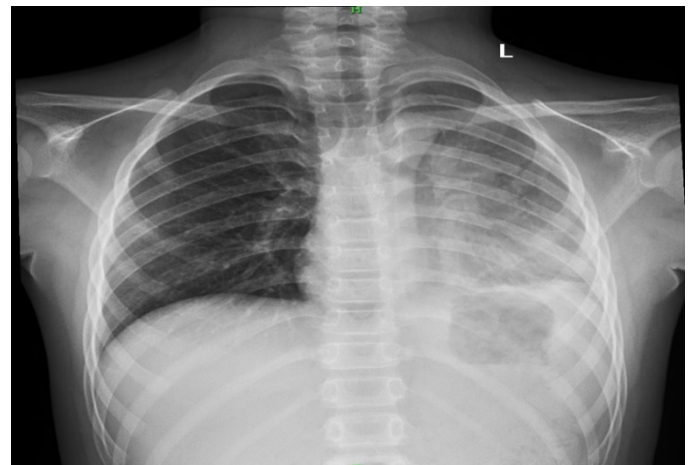


Figure a: Chest Xray PA view – Collapsed Left Lung.

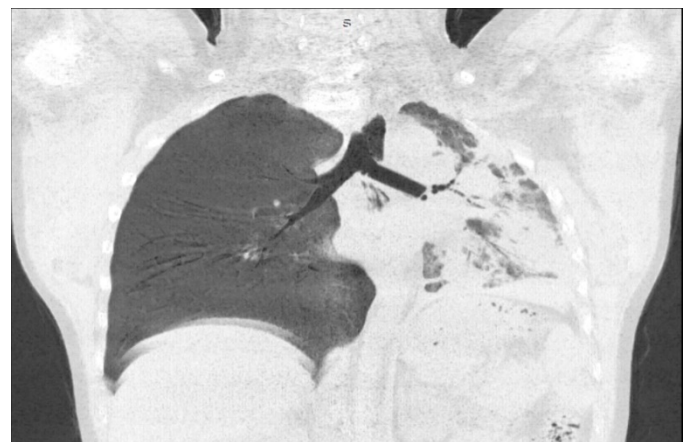


Figure b: CT – Thorax shows Collapse of left upper and lower lobes.

With Negative COVID-19 CBNAAT under general anesthesia, child underwent Rigid Bronchoscopy for

foreign body retrieval but the procedure was abandoned as multiple attempts to retrieve the object using the grasper failed.

Post procedure, the child was on synchronized intermittent mandatory ventilation (SIMV) and progressively extubated the next morning. Following which the patient was planned for a Computed tomography of Thorax and Virtual Bronchoscopy to help identify the site of foreign body obstruction and distal airway patency.

Computed Tomography of Thorax of the child (c) taken was inconclusive about the foreign body site but revealed complete resolution of the atelectasis and narrowing of airway in the left lung as compared to the previous scan. A cylindrical dilatation of posterobasal segmental bronchus of the right lower lobe with large mucus plug 10x9mm was seen which was not described in the previous scan.

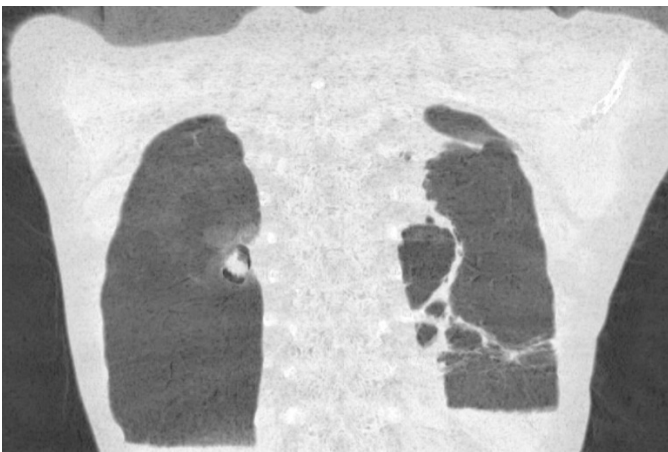


Figure c: CT thorax – shows Resolution of atelectasis of left side and Cylindrical Dilatation with large mucus Plug in the Right lower lobe.

In view of this the child was planned for a Flexible Bronchoscopy under sedation by the pulmonologist. Under IV Sedation flexible bronchoscopy was performed on the child and the Foreign Body was visualized in the Right lower lobe tertiary bronchus (d).

Attempts were made to retrieve the object but failed. Post procedure was uneventful. The child was started on IV Steroids and Adrenaline nebulization.



Figure d: Flexible bronchoscopy – Foreign body (pencap) in the Right lower lobe tertiary bronchus.

The patient was planned and consent was taken for Rigid/Flexible Bronchoscopy +/- Thoracotomy with bronchotomy +/- Lower lobectomy under general anesthesia after counselling the parents about the complications and risks of lobectomy and need for prolonged ventilation and ICU care. Reverse transcription polymerase chain reaction Rt-PCR for Covid 19 nasal and throat swabs were sent and found to be negative. With the help of Flexible and Rigid Bronchoscope multiple attempts underwent to remove the foreign body but in vain. After 2 hours, attempts at grasping the object with any forceps only seemed to push it distally further.

Thus, decision was made to retrieve the foreign body with a Right lateral thoracotomy (e). Foreign body was palpated at the lower most area of the right lower lobe. Incision made over the foreign body and retrieved (f). Lung closed using vicryl 3-0 and gelfoam was kept over the suture site. Chest was closed over ICD in situ. Post operatively the child was shifted to PICU isolation and continued with Steroids and adrenaline nebulization to

reduce the oedema in the trachea and bronchi. Child was extubated the following day and post-operative Chest X Ray shows good lung expansion. ICD was removed on the 3<sup>rd</sup> post-operative day following which the child tolerated orals well.

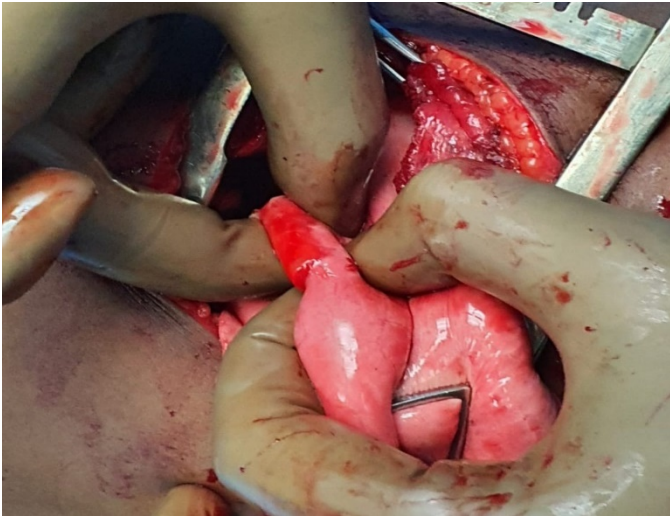


Figure e : Right Lateral Thoracotomy- Foreign Body palpated.



Figure f: Pen cap.

On the 6<sup>th</sup> post operative day, child developed cough, fever spikes and chest pain. Covid -19 CBNAAT was sent and found to be positive. Antibiotics were hiked to meropenem and azithromycin. Supportive care was given for the child in the isolation Covid Ward. IV antibiotics were continued for 10 days following which RT PCR was sent – found to be negative. Child was

symptomatically better and discharged. Child was later reviewed in the OPD and presently doing well.

### Results

The above case depicts unique scenario of accidental foreign body aspiration which was complicated. Management should be considered according to case, proper pre-operative imaging, minimally invasive approach should be attempted and observation for postoperative complications. The patient recovered well postoperatively and follow-up after discharge revealed no further complications.

### Discussion

Physicians should always consider foreign body aspiration diagnosis with high index of suspicion when children present with typical symptoms like coughing, wheezing, shortness of breath or cyanosis (3). Amidst COVID era with similar Symptom complex diagnosis of foreign body aspiration should not be neglected.

The most common site of foreign body lodgment is the Right lower bronchus or bronchus intermidus as it is more vertical and shorter (3,4). As seen in this case foreign body lodgment in the Left main bronchus in itself is a rare occasion.

Pen cap aspiration is a challenging problem because of the difficulties during extraction and higher morbidity compared with other foreign body aspirations (5).

- Only metallic cap foreign bodies are seen in the Chest Xray, thus secondary radiographic changes must be sought out in case of plastic caps.
- Pen caps have a slippery surface, they tend to slip during bronchoscopic removal. In this case movement of the pen cap from the left bronchi to the right lower segmental bronchi could be due to dislodgment while attempting bronchoscopy or administering anaesthesia (6).



• Immobility, very distant bronchial placement, impossible grasping owing to severe circular bronchial oedema proximal to the foreign body and the pen cap having settled completely in the bronchus are other challenges faced in this particular case on attempting bronchoscopic removal (7).

In this case many of these difficulties when faced made us to opt the surgical management for the patient.

In the background of corona virus pandemic, procedures like Bronchoscopy puts the pediatric surgeon at highest risk of exposure. Thus, adequate Personal protective wear should be mandatory before performing such procedures. Owing to the high infectivity, spread of the corona virus and large number of cases in India highlight the need of the hour to take adequate safety precautions while performing emergency procedures as depicted in this case.

### **Conclusion**

Amidst the pandemic, prompt diagnosis of foreign body aspiration and differentiating it from COVID- 19 infection is critical for the physician. Timely intervention with experienced surgical and ICU team will minimize the mortality and complication rates.

Rigid Bronchoscopy is the Gold Standard for Foreign body retrieval but open surgical procedures including Thoracotomy and Bronchotomy for retrieval of Impacted Foreign body or complicated cases are invaluable adjunctive. (8)

While performing emergency procedures like bronchoscopy, personal protective measures are to be strictly taken in view of high aerosol exposure in relation to COVID -19 infections.

Multidisciplinary team consisting of surgeons, anesthetist, pulmonologist, radiologist and pediatric

intensive care unit holds for the good outcome of the patient.

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