ORIGINAL RESEARCH PAPER

Otorhinolaryngology

A CASE SERIES OF FOREIGN BODY ASPIRATION : CHALLENGES, MODALITIES AND OUTCOMES

KEY WORDS: Foreign body, aspiration, life threatening, bronchoscopy, Optical Forceps

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ABSTRACT

INTRODUCTION: Foreign body (FB) aspiration is a common problem in children, requiring early diagnosis and prompt treatment to avoid potentially life-threatening complications. FB aspiration still remains an important cause of childhood deaths, especially in pre-school children. **METHODOLOGY:** We are presenting a case series of six cases of foreign body in the airway who presented to the emergency department of M.G.M Medical College and M.Y. Hospital, Indore with complaints of sudden onset cough or difficulty in breathing. **DISCUSSION:** Foreign Body aspiration is a common but potentially life-threatening emergency in the pediatric age group. This case series proves to show the necessity of timely diagnosis and appropriate management by bronchoscopic removal in cases of Foreign body aspiration. **CONCLUSION:** Foreign body aspiration continues to be a growing challenge for ENT surgeons since it is critical to diagnose and manage such patients as quickly as possible with no time to waste. Rigid bronchoscopy continues to remain the Gold standard treatment modality with Hopkins Rod Telescope and Optical Forceps being the new advances in this field.

INTRODUCTION

Foreign body (FB) aspiration is a common problem in children, requiring early diagnosis and prompt treatment to avoid potentially life-threatening complications. FB aspiration still remains an important cause of childhood deaths, especially in pre-school children.(1)

Accidental aspiration of both organic and inorganic foreign bodies continue to be a cause of childhood morbidity and mortality. Early recognition with a high index of suspicion remains a critical factor in the treatment of FB inhalation in children.(2)

METHODOLOGY

We are presenting a case series of six cases of foreign body in the airway who presented to the emergency department of M.G.M Medical College and M.Y. Hospital, Indore with complaints of sudden onset cough or difficulty in breathing. A detailed history was taken in all cases and clinical examination done. Routine blood investigations were sent. Radiological investigations were done with plain digital xray of the chest and Virtual Bronchoscopy to confirm the diagnosis of foreign body aspiration. After informed and written consent, rigid bronchoscopy was done and foreign body removed from the airway.

CASE 1 – AN UNUSUAL FOREIGN BODY

A 9 months old male child presented to the Emergency department with history of cough, which was sudden in onset since 4 days. He also had history of fever since 4 days for which the patient was taken to a nearby health centre, where he was given OPD treatment for cough, but the patient's symptoms were not relieved.

They were then referred to M.G.M Medical College and M.Y.Hospital Indore. History of Foreign body ingestion was elicited, which was negative.

On examination, saturation was 93% on room air and the patient had intercostal & subcostal retractions. On auscultation, air entry was reduced on the left side of chest. A digital chest sciagram (AP & lateral view) was done in which a sharp radio-opaque foreign body was visualized in airway at the level of T5-T7 and reduced inflation of left lung field was observed.(Fig 1)

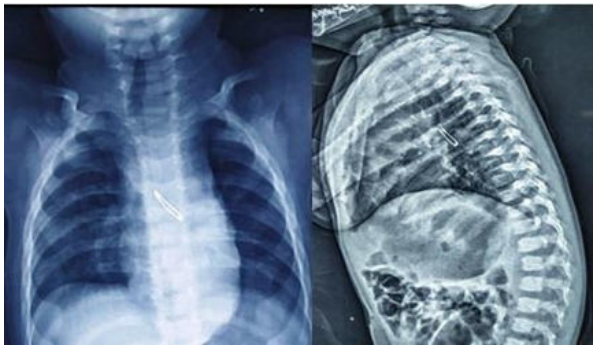
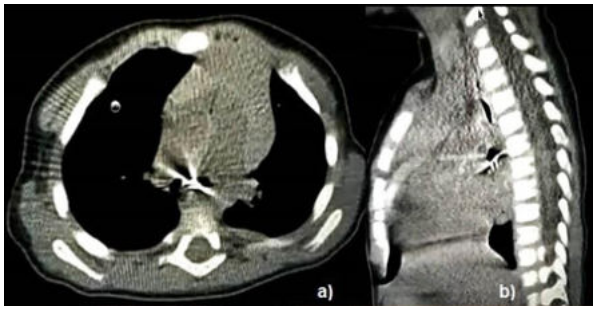


Fig 1 : Chest X-ray PA view showing a sharp radio-opaque foreign body at the level of T5-T7

A CT Virtual Bronchoscopy was done, in which a hyperdense F.B. measuring approximately 18mm in length was visualised at the carina extending into the left main bronchus with near - complete collapse of left lower lobe. Large patchy areas of air-trapping were noted in the left lung.(Fig 2)



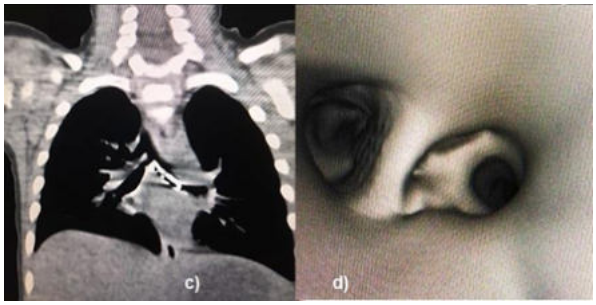


Fig 2 : a) Axial, b) Sagittal, c) Coronal sections of chest and d) Virtual Bronchoscopy image

Rigid Bronchoscopy was done under general anaesthesia. Using a Hopkins rod telescope, a foreign body was visualized in the left main bronchus.(Fig 3.)

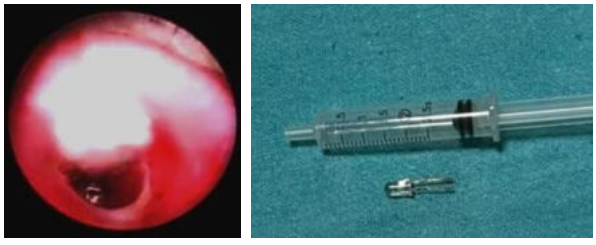


Fig 3 : a) Telescopic visualization of Foreign Body LED bulb in the left main bronchus b) Foreign Body LED bulb with filaments

Grasping forceps were used to grasp one of the prongs of the **LED bulb** and the bulb was pulled into the rigid bronchoscope lumen so as to not cause injury to the airway. The forceps along with the rigid bronchoscope were withdrawn simultaneously. The child recovered fully post operatively and the post-op chest xray was clear with adequate inflation of bilateral lung fields.

CASE 2 : A DANGEROUS SITE OF FOREIGN BODY IMPACTION IN AIRWAY

A 2 year old female child presented to the Emergency department, with history of bouts of cough, noisy breathing and difficulty in breathing since 1 day. After eliciting detailed history, it was found that the child was playing with toys when the symptoms started. On examination, SpO2 was 91 % on room air, severe intercostal and subcostal retractions were present, nasal flaring was seen and air entry was significantly reduced bilaterally. There was inspiratory wheeze and bilateral crepitations on auscultation. Chest X-ray showed reduced inflation of bilateral lung.

CT virtual bronchoscopy was done which showed a 12 x 2.4 mm hyperdense linear foreign body in the subglottic region 6 mm inferior to the glottis.(Fig 4.)

Fig 4 : CT chest Coronal section and CT Virtual Bronchoscopy section showing foreign body in subglottis

Under high risk consent, rigid bronchoscopy was performed and the foreign body was removed successfully from the subglottis, which was found to be a **plastic toy part**.(Fig 5.) There were no complications and the child recovered immediately postop.

Fig 5. Foreign body plastic toy part

CASE 3 : MOST COMMON VEGETATIVE FOREIGN BODY IN INDIAN SETTING

A 2 year old male child presented to the emergency department with history of cough and labored noisy breathing which was sudden in onset. The parents gave history of peanut ingestion just prior to symptom onset. On examination, SpO2 was 89 % on room air and on auscultation, breath sounds were reduced on right side along with a right sided inspiratory wheeze and crepitations. Intercostal retractions were present.

A CT Virtual bronchoscopy was performed which showed an 8 x 5 mm oval iso- hypo dense foreign body in the right main bronchus soon after the bifurcation, 11 mm from carina.(Fig 6.)

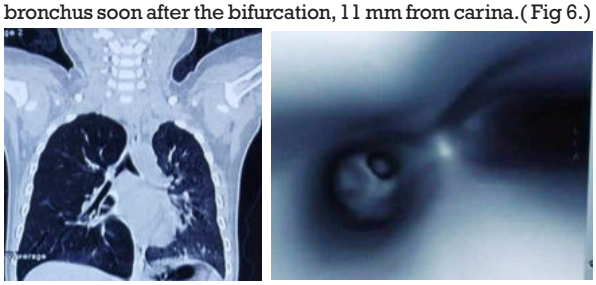


Fig. 6 : CT chest Coronal section and CT Virtual Bronchoscopy section

After informed consent, rigid bronchoscopy was performed, and the Foreign body peanut was visualized using a 0 degree Hopkins Rod telescope. Optical forceps were used to grasp the foreign body under visualization and the foreign body was pulled out.(Fig 7.)

Fig 7 : Foreign Body peanut

Postoperatively, the child recovered fully and was discharged in two days. Foreign body peanut maybe considered as the most common foreign body in the Indian setting, especially in the age group 1 – 3 years, where parents start feeding the children solid foods including peanuts.

CASE 4 : A NEGLECTED VEGETATIVE FOREIGN BODY IN AIRWAY

A 1 year old female child presented with complaints of cough and difficulty in breathing for 7 days. No definite foreign body ingestion history could be elicited. On examination, SpO2 was 94% on room air; there were subcostal and intercostal retractions along with nasal flaring. On auscultation, air entry

was severely reduced on the left side and crepitations with wheeze were heard on the left lung field. These findings along with the sudden history of symptoms raised a high index of suspicion of foreign body aspiration.

CT virtual bronchoscopy was done which showed a well defined oval hyperdense foreign body measuring 1 x 1.1 x 1.3 cm, occluding lumen of left main bronchus, located 15 mm distal to bifurcation of trachea. (Fig 8.)

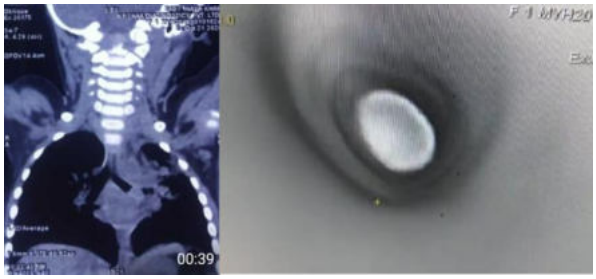


Fig. 8 :CT chest Coronal section and CT Virtual Bronchoscopy section

Rigid bronchoscopy was done and the FB was visualized in left main bronchus. Grasping forceps was used to grasp and remove the foreign body. It was found to be a sitaphal seed(Fig 9). Air entry on the left side improved on table and the child improved drastically post-operatively. She was discharged after 3 days.

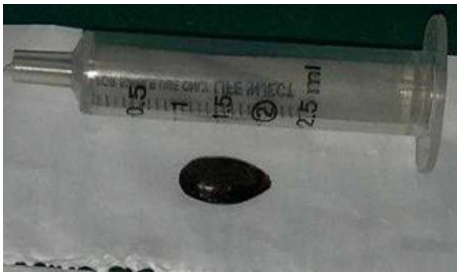


Fig 9 :Foreign Body sitaphal seed

CASE 5 : A CHALLENGING SCENARIO

A 2 year old male child presented with complaints of cough and difficulty in breathing for 2 days. It was sudden in onset and the symptoms started at night after the child was put to sleep. No definite foreign body ingestion history was given. On examination, SpO2 was 92% on room air; there were subcostal and intercostal retractions. On auscultation, air entry was reduced on the left side along with added sounds, mainly crepitations and wheeze. Despite not having a definite history of FB ingestion, the course of symptoms suggested that a CT virtual bronchoscopy was to be done to diagnose or rule out foreign body aspiration.

CT virtual bronchoscopy was done which showed a nodular hyperdensity of around 7 x 4 mm in the left main bronchus, 13 mm distal to the carina(Fig 10).

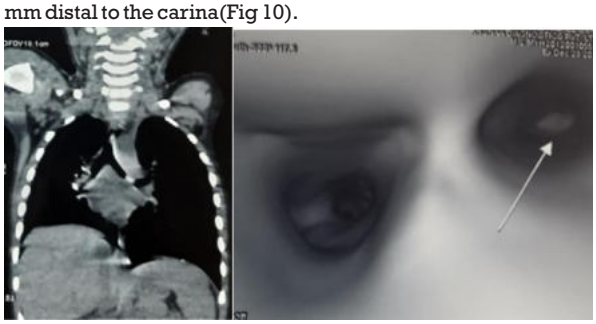


Fig 10 :CT chest Coronal section and CT Virtual Bronchoscopy section

Rigid bronchoscopy was performed, and the foreign body was seen in the left main bronchus. The foreign body was removed with the help of grasping forceps. The foreign body was found to be supari (betel nut)(Fig 11).The child improved postoperatively and was discharged with no complications. Ward stay was uneventful.

Fig 11 :Foreign Body supari(betel nut)

CASE 6 : A DIAGNOSTIC DILEMMA

A 9 months old female child presented to the emergency department in the evening with complaints of noisy breathing and difficulty in breathing. The symptoms started in the morning and were sudden in onset. The child was playing with siblings when she suddenly developed noisy breathing. She was taken to the district hospital from where she was immediately referred to our tertiary care centre. Parents gave history of accidental peanut ingestion while playing. On examination, SpO2 was 85% on room air; breathing was noisy and labored. There were severe intercostal and subcostal retractions. Nasal flaring was seen. On auscultation, air entry was reduced bilaterally and crepitations were heard bilaterally.

A CT virtual bronchoscopy was done urgently which did not show any evidence of an obvious hyperdense foreign body in the tracheobronchial tree. Despite the negative CT report, a high index of suspicion was kept due to the strong foreign body ingestion history, and an urgent rigid bronchoscopy was planned.

On rigid bronchoscopy, a foreign body was visualized at the level of the glottis, which was grasped and removed with the help of grasping forceps.The foreign body was found to be part of hard peanut shell.(Fig 12).

Fig 12 :Foreign Body peanut shell

There were no complications during the procedure and the patient improved postoperatively.

This case was a diagnostic difficulty since the CT scan could not pick up evidence of foreign body in the airway. CT Virtual Bronchoscopy is the gold standard diagnostic modality in cases of FB aspiration. In this case, strong history and a high index of suspicion helped in taking the decision to perform rigid bronchoscopy.

DISCUSSION :

Foreign Body aspiration is a common but potentially life-threatening emergency in the pediatric age group.

Children present a high risk of foreign body aspiration, which is attributed to several factors mainly : a) tendency to put objects in their mouth; b) absence of molars ; c) to cry, walk

and run with objects inside their mouth; d) lack of coordination of swallowing with the elevation of the larynx, which is immature in small children.(3)

This case series proves to show the necessity of timely diagnosis and appropriate management by bronchoscopic removal in cases of Foreign body aspiration.

All the patients in this series improved postoperatively and recovered uneventfully.

The single most valuable investigation in such cases is a CT Virtual Bronchoscopy, which is invaluable in diagnosing foreign bodies that are radiolucent and not visible on routine radiography. Rigid Bronchoscopy continues to be the Gold Standard treatment modality in these cases.

Foreign body aspiration is a common problem in children, requiring early diagnosis and prompt treatment to avoid potentially life-threatening complications.(4)

This study was intended to showcase the extraction of six difficult cases of airway foreign bodies and also their management.

CONCLUSION :

Foreign body aspiration continues to be a growing challenge for ENT surgeons since it is critical to diagnose and manage such patients as quickly as possible with no time to waste.

CT virtual bronchoscopy is the radiological gold standard investigation to confirm the presence of a foreign body in the airway with positive predictive value of over 98 %; whereas chest radiography had a high percentage of false negative results, in cases of radiolucent foreign bodies.

Rigid bronchoscopy continues to remain the Gold standard treatment modality with Hopkins Rod Telescope and Optical Forceps being the new advances in this field.

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