



A case of aspirated foreign body pop corn maize seed in an infant successfully treated - Sur Hospital experience

Fahim Ahmed shah, S.Hasan Abdul Cader, S.K.G.Reghunandan Nair

Sur Hospital, South Sharqiya region. Sur, Sultanate of Oman.

ABSTRACT

Here we are reporting a case of an infant who accidentally aspirated a maize seed while eating pop corn unattended with no one nearby! This popcorn was hard and unpoped and probably hard enough to be chewed by the small infant. The child was brought from periphery to the emergency department of our secondary care Centre in a collapsed state from where he was immediately taken to operation theatre and in general anaesthesia with bronchoscopy the foreign body was retrieved and child was saved and successfully treated.

The object of this case report is to highlight the importance of this kind of emergency and to note that aspiration causing complete upper airway obstruction is an emergency requiring immediate intervention.

Introduction

Foreign body aspiration poses a big diagnostic and therapeutic challenge to otorhinolaryngologists around the globe ⁽¹⁾. The major issue involves the accurate diagnosis, speedy and safe retrieval of the foreign body. The accurate diagnosis may allude even the sophisticated physician because often the initial choking incidents are not witnessed and the delayed symptoms may mimic other common conditions, such as asthma, pneumonia, or upper respiratory tract infections ^(1, 2). The retrieval of foreign body has been facilitated by technical improvements with the rod lens telescope, video endoscopy, a broad range of a variety of sized forceps and safe anaesthesia. In spite of these advances, more than 3000 documented deaths occur per year because of foreign bodies and an untold number of patients survive miraculously.

Inhalation of foreign bodies is seen more commonly in paediatric age group and nearly 94% of them occur in infant and children^(3, 4). The highest incidence occurs between the age of 1-3 years^(1, 5) and it is rare in adults. Patients often present in the emergency with acute onset respiratory distress and occasionally in a cyanosed state. At the other end of the spectrum is the patient who walks in with nothing more than a history of aspiration and on investigation is found to have a foreign body in his bronchus⁽⁶⁾. The symptoms and signs produced depend upon the nature, size, location and time since lodgement of the foreign body in the tracheo-bronchial tree. A large foreign body occluding the upper airway may lead to sudden death whereas a small foreign body lodged in the bronchial tree may present with less severe symptoms^(6, 7). Early diagnosis and treatment are imperative to prevent mortality as well as complications. Foreign body aspiration is associated with cough and sometimes this maybe the only symptom. To diagnose a foreign body, a high index of suspicion is very important and a diagnosis in time can save the patient from an unnecessary surgical procedure. Presently bronchoscopy is considered the gold standard in the diagnosis and treatment of foreign body aspiration.

Any disorder which is associated with infiltration, inflammation, constriction, or compression of the airways can cause cough. Development of sudden cough with or without wheezing and decreased breath sounds should always suggest the possibility of a foreign body aspiration. Foreign body aspiration manifests with a wide range of clinical presentations and often these are not accompanied by any reliable witness to supply clinical history especially in children.

Since imaging modalities are often not adequate in making a diagnosis, foreign body aspiration can go unrecognized for a long time, during which time these patients may have been given medications for other disorders. Unrecognized foreign body aspiration if present over a long period of time can lead to complications such as unresolving pneumonia, lung abscess, recurrent haemoptysis, and bronchiectasis⁽⁸⁾. It can cause complete destruction of a distal lobe and even the lung, which may subsequently need surgical resection since, late removal of a foreign body does not improve structural damage. Chronic persistent cough in older people can also be due to aspirated foreign body. Therefore early diagnosis of foreign body aspiration is necessary to prevent these complications.

The degree of difficulty will depend on a number of factors: the age of the patient the type of foreign body inhaled, the interval between inhalation and removal, the skill of the anaesthetist and the equipment available. Modern techniques of endoscopic removal of bronchial foreign bodies stem from the advance made in the early part of the century by Chevalier Jackson who reduced the mortality of removal of foreign bodies from over 20% to approximately 2%. Since then improvement in the illumination provided by the Hopkins rod lens system and the advent of the ventilating bronchoscope (Hopkins, 1976) coupled with the advances in anesthesia, have further reduced the mortality. The maximum incidence of inhalation of foreign bodies occurs between the age of 1 and 3 years.

The most common cause of accidental death in the home in children under 6 years of age is the inhalation of a foreign body. The peak incidence of inhalation of foreign bodies in early childhood is of course related to the fact that children have a habit of putting objects into their mouths to determine their texture and taste, and to chew on when teething. For the airway foreign bodies the most frequent symptom is the so called 'penetration syndrome' defined as the sudden onset of choking and intractable cough, with or without vomiting; other presenting symptoms that occur in isolation or in association are cough, fever, breathlessness and wheezing. It is extremely important, therefore, where possible to keep objects which might be inhaled out of the reach of small children. In conclusion, in spite of an obvious foreign body in the tracheobronchial tree many cases are not diagnosed because sudden choking at the time of aspiration in children may not be noticed.

Case Report

Here we are reporting a case of an infant who accidentally aspirated a roasted maize seed while eating popcorn unattended with no one near by nearby! This popcorn was hard and unpopped and probably hard enough to be chewed by the small infant. The child was then brought to the emergency department of our secondary care centre with the complaints of FB impaction in the throat., no proper history of any witness of somebody saw child choking was available but that the child was eating popcorn and became ,choked collapsed and shocked no one was nearby to notice bouts of cough episode of cyanosis or child turning blue or to witness any sign of respiratory distress ,but because of the positive history and the condition of the child in which he was presented in an emergency child was intubated in RR and emergency endoscopy was planned, child was admitted

and after stabilizing the child in RR child was immediately shifted to CT room. Emergency x-ray chest was taken (Figure-1) .X ray showed hyperventilation of left lung and. CT chest fig 2 (HRCT)showed evidence of foreign body in left main bronchus . Written consent was obtained for the procedure In our case the type of Inhaled foreign body we are referring to is a cooked, but unpopped, popcorn more often known as old maids. Popcorn is scientifically known as *Zea mays everta*. It is a type of maize, or corn . Popcorn is a whole grain and is made up of three components: the germ, endosperm, and pericarp (or hull). Popcorn differs from other types of corn in that its hull has just the right thickness to allow it to burst open.

Some Native Americans believed that a spirit lived inside each kernel of popcorn. When heated, the spirit grew angry and would eventually burst out of its home and into the air as a disgruntled puff of steam. A less charming but more scientific explanation exists for why popcorn pops, according to which popcorn contains a small drop of water stored inside popcorn which will lose moisture by passage of time this is, why some resist popping into puffy white globes. Popcorn kernels must have a precise moisture level in their starchy center — about 15 percent — to explode. It turns out that an optimal moisture will affect the way they pop. Some will not pop because there wasn't enough moisture in them because too much moisture escapes, it loses its ability to pop and just become a roasted maize seed . The unpopped corns are the rock-hard, jaw-rattling ones slippery due to leaky hulls that may be inhaled Unpopped popcorn shown in the fig was retrieved in our case.

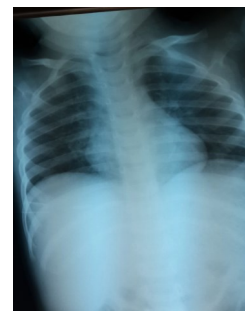
During the first part of the twentieth century Chevalier Jackson perfected endoscopic techniques and made perioral endoscopy an important tool. Diagnostic rigid bronchoscopy was done. Endoscopy was carried out under general anaesthesia.

Operative notes : Under GA bronchoscope was done using size 3.5 x 30 cm paediatric bronchoscope was introduced and assisted by anaesthetist's Laryngoscope it was negotiated through the glottis and advanced to the carina and then into the left principal bronchus and as it just entered the left principal bronchus the foreign body came into view- it was a yellowish material under the illumination of the scope. The foreign body was grasped with peanut forceps and brought to the beak of the scope and withdrawn with the scope to the sub glottis where the foreign body was rotated with the forceps to align with the glottis inlet for easy removal and then delivered outside entire with the scope.

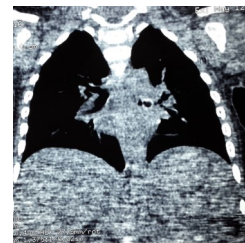
The foreign body on removal was found to be a globular brownish roasted maize seed measuring about 1 cm x 0.5 cm size, removed in toto. The bronchoscope was reintroduced to check for any other foreign body material- nothing was found in the trachea and bronchi. The procedure was uneventful. The baby stood the procedure well maintaining vitals and SpO₂. He had no stridor and no immediate post operative complications were noted. The child recovered fine, postoperatively.



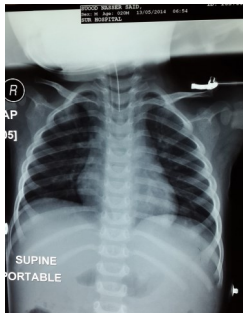
Figure showing maize seed after removal



Pre operative x-ray chest showing hyperventilation of left lung



Pre operative CT scan (HRCT) showed evidence of foreign body in left main bronchus



Post operative chest x-ray showing clear Lung fields

Discussion

Foreign body aspiration poses a big diagnostic and therapeutic challenge to otorhinolaryngologists around the globe ⁽¹⁾. The major issue involves the accurate diagnosis, speedy and safe retrieval of the foreign body. The accurate diagnosis may allude even the sophisticated physician because often the initial choking incidents are not witnessed and the delayed symptoms may mimic other common conditions, such as asthma, pneumonia, or upper respiratory tract infections ^(1, 2). The retrieval of foreign body has been facilitated by technical improvements with the rod lens telescope, video endoscopy, a broad range of a variety of sized forceps and safe anesthesia. In spite of these advances, more than 3000 documented deaths occur per year because of foreign bodies and an untold number of patients survive miraculously. Inhalation of foreign bodies is seen more commonly seen in pediatric age group and nearly 94% of them occur in infant and children ^(3, 4). The highest incidence occurs between the age of 1-3 years ^(1, 5) and it is rare in adults.

Patients often present in the emergency with acute onset respiratory distress and occasionally in a cyanosed state. At the other end of the spectrum is the patient who walks in with nothing more than a history of aspiration and on investigation is found to have a foreign body in his bronchus ⁽⁶⁾. The symptoms and signs produced depend upon the nature, size, location and time since lodgement of the foreign body in the tracheobronchial tree. A large foreign body occluding the upper airway may lead to sudden death whereas a small foreign body lodged in the bronchial tree may present with less severe symptoms ^(6, 7). Early diagnosis and treatment are imperative to prevent mortality as well as complications. Foreign body aspiration is associated with cough and sometimes this maybe the only symptom. To diagnose a foreign body, a high index of suspicion is very important and a diagnosis in time can save the patient from an unnecessary surgical procedure.

Presently bronchoscopy is considered the gold standard in the diagnosis and treatment of foreign body aspiration. Any disorder which is associated with infiltration, inflammation, constriction, or compression of the airways can cause cough. Development of sudden cough with or without wheezing and decreased breath sounds should always suggest the possibility of a foreign body aspiration. Foreign body aspiration manifests with a wide range of clinical presentations and often these are not accompanied by any reliable witness to supply clinical history especially in children.

Since imaging modalities are often not adequate in making a diagnosis, foreign body aspiration can go unrecognized for a long time, during which time these patients may have been given medications for other disorders.

Unrecognized foreign body aspiration if present over a long period of time can lead to complications such as unresolving pneumonia, lung abscess, recurrent haemoptysis, and bronchiectasis⁽⁸⁾. It can cause complete destruction of a distal lobe and even the lung, which may subsequently need surgical resection since, late removal of a foreign body does not improve structural damage. Foreign body can only enter the air passage if there is some interference with the normal reflex action, such as sudden inspiration while eating, playing, fright or laughter. In children probably the protective reflex is not as effective as in adults therefore these accidents being more common in children as compared to adults. Therefore early diagnosis of foreign body aspiration is necessary to prevent these complications. Foreign bodies lodged in the aero digestive tract are a common surgical emergency presenting to the Accident & Emergency department in many centres and contribute significantly to high morbidity and occasionally mortality^[1].

Children aged between 1 and 3 years are commonly affected^[1, 5]. In the present case, the child was aged two years. Several factors contribute to high incidence of tracheobronchial tract foreign bodies in this age group including social factors (e.g. carelessness of parents, children's habit of putting objects in their mouth, crying/playing during eating) and anatomical factors (e.g. absent of molar teeth, inadequate control of deglutition) have been mentioned^[8, 9].

For the diagnosis the history and clinical examination is important and the most common radiological investigation ordered is perhaps a chest X-ray and/or lateral view of neck. The use of CT to aid the diagnosis of tracheo-bronchial foreign bodies has been a great advantage. In one study, the sensitivity of cough and choking was 82% and with a specificity of 80%; of a chest radiograph was 66% with a specificity of 51%; that of auscultation was 80% with specificity of 72%.⁽⁹⁾

combination of history, signs and radiological abnormalities is more useful than any one separately and a high index of suspicion is essential.⁽¹²⁾ The choice of using a flexible or a rigid endoscope is controversial with rigid variety more in use and favored for the tracheo-bronchial foreign bodies.

Conclusion

The incidence of foreign body aspiration is seen in age group i.e. below 3 years. Since the signs and symptoms of foreign body aspiration are very non specific it may lead to a delay in the diagnosis and treatment. This delay can lead to a dangerous situation or sequel therefore a high index of suspicion is important in the diagnosis of foreign body aspiration. Whenever there is sudden onset of symptoms like cough, wheezing, or a shocked or collapsed child, foreign body aspiration should be ruled out as a diagnosis. Since aerodigestive tract foreign bodies are preventable surgical condition, preventive measures should be directed at the high risk group (children) whereby parents should be educated to keep a close eye on their children and keep objects which can be foreign bodies away from children's reach.

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