



## ANAESTHETIC MANAGEMENT OF TRACHEOBRONCHIAL FOREIGN BODY INGESTION IN A TWO YEAR OLD CHILD : A CASE REPORT

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### ABSTRACT

Pediatric tracheobronchial foreign body aspiration can be a life-threatening emergency, especially in young children because of their decreased respiratory reserve and smaller diameter airway. A two year old male child aspirated pieces of peanut into the lower trachea and right main bronchus. These were removed via rigid bronchoscopy under general anaesthesia. An intravenous anaesthesia was maintained with inhalational anaesthetic agents along with muscle relaxants to ensure an immobile airway during surgery. The case reaffirms that removal of numerous pieces of a foreign body is challenging procedure that requires a proper anaesthetic plan and coordination with surgeons.

**KEYWORDS :** Tracheobronchial foreign body, Aspiration, Child

### INTRODUCTION

Pediatric tracheobronchial foreign body aspiration is an important cause of accidental death in preschool aged children. The presentation varies depending upon location, size and chronicity of foreign body. Common signs and symptoms may include coughing, choking, dyspnea and inspiratory stridor<sup>1</sup>. The optimal time for removal of foreign body should be within 24 hours of ingestion to avoid complications caused by retention of foreign body<sup>2</sup>. Gold standard for diagnosing and removal of foreign body is rigid bronchoscopy under general anaesthesia<sup>3</sup>. Whereas in doubtful case of presence of foreign body in distal airway flexible bronchoscopy can be performed<sup>4</sup>.

In this case, a peanut was aspirated by a two year old child and removed by rigid bronchoscopy under general anaesthesia.

### CASE REPORT

A two year old male, weighing 11 kilograms with history of peanut aspiration that occurred 12 hours ago was admitted to our institute. Physical examination showed wheezing, biphasic stridor, suprasternal retractions and bilateral decreased breath sounds. Child's chest radiograph (AP and Lateral views) revealed a right upper lobe zone haziness. (Figure 1)



Figure 1: Chest Xray AP & Lateral views

Preoperatively, patient's respiratory rate was 36/min, saturation was 85% on room air, Heart rate was 140/min with no arrhythmia and blood pressure was 100/60 mmHg. Patient was preoxygenated with 100% oxygen for 3 minutes to allow denitrogenation. IV atropine (0.02 mg/kg), fentanyl (1 mcg/kg), propofol (2mg/kg) and succinylcholine (1mg/kg) was given during induction. Rigid bronchoscope was inserted through glottic opening and to allow ventilation breathing circuit was connected to side arm of bronchoscope.

Anaesthesia was maintained with inhalational agents along

with vecuronium (0.1 mg/kg) when required. Manual positive pressure ventilation was applied when necessary to keep saturation at > 80%. It took 90 minutes for removal of crushed pieces of peanut (Figure 2). During the procedure, the patient's heart rate was between 120-140 bpm/min, MAP was 50-60 mmHg and saturation varied between 75% to 85%. Upon removal of bronchoscope, a 4 mm oral endotracheal tube was inserted to maintain the airway and connected with breathing circuit. In view of long duration of surgery, episodes of hypoventilation and anticipated airway oedema due to prolonged and deep instrumentation, patient was transferred to pediatric intensive care unit with endotracheal tube and oral Ryle's tube in situ. He was electively ventilated for another 24 hours and successfully extubated afterwards. He was discharged home on postoperative day five.



Figure 2: Crushed pieces of peanut

### DISCUSSION

Foreign body aspiration is a very frequently occurring situation in pediatric practice; however, it is not always immediately diagnosed, partly because this diagnosis is not frequently in mind, but also because FBA does not have a specific clinical manifestation<sup>5</sup>. Among the pediatric patients, children between the ages of 12-48 months have been found to be the major victims owing to their poor chewing ability because of the lack of posterior dentition, a tendency to put things into mouth, and a tendency to have frequent vigorous, uninhibited inspirations when startled, laughing or coughing<sup>6</sup>. Foreign bodies have a tendency to lodge in the right main stem bronchus as it is more vertical and larger in diameter than the left main stem bronchus<sup>6,7</sup>.

In 1897 *Gustav Killer* removed a foreign body from lower respiratory tract with a rigid bronchoscope. During 1st part of 20th century, *Chevalier Jackson* perfected endoscopic technique<sup>8</sup>. Even bronchoscopy which is considered a safe technique, carries a risk of complications that has received little emphasis in other reviews. In fact, these potential complications are significant and may occur even in

experienced hands, primarily when the foreign body is located in distal areas. Rigid bronchoscopy is the procedure of choice for retrieval of airway foreign bodies in children. Complications like bronchospasm, foreign body dislodgement, pneumothorax, pneumomediastinum, hydropneumothorax, pneumonia, atelectasis, bronchial stenosis and abscess occur in 22-33% of patients while tracheal/vocal cord lacerations, subglottic edema and need for surgical retrieval of the foreign body are seen in 6-8%. Since foreign bodies are typically stuck distally in the lower lobe bronchi or the bronchus intermedius, acute presentation is rare; however, life-threatening asphyxia and sudden decompensation secondary to complete obstruction may occur<sup>8</sup>. In the present case, foreign body did not cause complete airway obstruction because it was crushed in pieces before it was aspirated. Also, such cases are challenging with respect to anaesthetic management because of lack of cooperation by pediatric patients, narrow airway lumen of patients and as surgeon and anaesthetist share common working field<sup>11</sup>.

A deep plane of anaesthesia should be maintained before airway instrumentation. In this case procedure was expected to last for a long time with deeper insertion of bronchoscope, therefore induction was done with propofol, fentanyl and succinylcholine and later anaesthesia was maintained with inhaled anaesthetic agents. To prevent coughing and enable the surgeon to work effectively, the patient's mobility and reflexes were suppressed by vecuronium. Although a high gas flow, high frequency, high tidal volume ventilation was used, the relatively long surgical procedure and hypoventilation caused CO<sub>2</sub> accumulation. Inpatient monitoring is advised in children with a complicated operative course.<sup>7</sup> Thus our patient was shifted to intensive care unit.

The present report describes a case in which a crushed peanut was inhaled endangering life of a two year old child. Removal of foreign body was a challenging procedure requiring well planned anaesthesia and excellent communication between anaesthetist and surgeon. We maintained anaesthesia with inhaled and intravenous agents although no consensus has been reached regarding superiority of inhaled or intravenous anaesthesia or spontaneous versus controlled ventilation. Technology that reduces the risk of complications, morbidity and mortality are the most suitable.

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