



CHALLENGES IN THE SHADOWS : OPTIMIZING ANAESTHETIC MANAGEMENT FOR NON-RADIOPAQUE TRACHEAL FOREIGN BODY REMOVAL IN PEDIATRIC PATIENT.

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ABSTRACT

The extraction of non-radiopaque tracheal foreign bodies (FBs) in paediatric patients presents unique diagnostic and anesthetic challenges due to the absence of radiographic visibility, delayed recognition, and the delicate nature of the paediatric airway. Diagnostic reliance on clinical history (choking episodes, sudden cough) and ancillary imaging (dynamic CT, ultrasound) was critical, as standard X-rays failed to localize FBs in all cases. Anesthetic management prioritized maintaining spontaneous ventilation to minimize dislodgement risk while ensuring adequate oxygenation. Close collaboration between anaesthesiologists and otolaryngologists ensured rapid airway control, with 92% successful FB retrieval on first attempt With help of bronchoscope. 7 year old female patient came in casualty for breathless, shortness of breath, dizziness and history of accidentally ingestion of foreign body. Anaesthetic management done with total intravenous anaesthesia and inhalational agent.

KEYWORDS : Non Radiopaque, tracheal foreign body, bronchoscope

INTRODUCTION

Foreign body aspiration (FBA) remains a critical paediatric emergency. The prevalence of foreign body aspiration in children was found to be 0.37%. On rigid bronchoscopy 83.6% were confirmed to have a foreign body in the airway. Historically Gustav Killian was the first to use the rigid bronchoscopy method in 1897 to remove a foreign body from the right main bronchus. Surgical intervention is required with a rate lower than 1%. These objects, which do not absorb X-rays and thus evade detection on standard radiographs, pose unique diagnostic and therapeutic challenges.

The clinical presentation of tracheal FBA in children is frequently nonspecific, ranging from acute choking episodes to subtle, persistent cough or wheezing, difficulty or shortness of breath. Rigid bronchoscopy stands as the gold standard for both confirmation and extraction. This case aims to address these gaps and management by evaluating diagnostic pathways, procedural success.

Case Report

7 year old female child came to casualty with complaints of sudden and repeated coughing, sense of choking, shortness and difficulty in breathing. Patient's relative gave history of accidental ingestion of foreign body 1 hour before.

On examination patient was afebrile, parameters were - pulse 104/min regular low volume , Blood pressure 90/62 mmhg, SPO2 92% on room air, respiratory rate 28/min. On auscultation air entry reduced in right lung field at upper and middle zone as compared to left, normal heart sounds presents. patient was conscious oriented. Oxygen given by venturi mask at 6 litres/ min which increased the saturation up to 98 percent. Intravenous access taken and iv fluid started at rate 40cc/hr. Blood sugar levels were normal and sinus tachycardia on 12 lead ECG. Chest x ray shows hyperinflated right lungs with normal left lung and no foreign body in trachea or any bronchus. Blood samples sent for labs, Haemoglobin 13mg/dl , WBC 7000, pletlet 1.64 lakh, bleeding and clotting time was normal.

Relative gave negative history for fever, allergy, any similar history in past which excludes the differential diagnosis as asthma, pneumonia, tuberculosis, epiglottitis,

retropharyngeal abscess, peritonsillar abscess. Provisional diagnosis made as non radiopaque foreign body in airway based on history and clinical and investigational findings.

Informed to Otolaryngologist, decided for endoscopy and removal of foreign body. Procedure, Written informed consent signed and explained. Patient taken inside operation theatre on emergency basis.

After attaching monitors and iv fluid patient was given premedication Inj. Glycopyrolate 5 microgram/kg, Inj Ondansetron 0.08 mg/kg, inj midazolam 0.03 mg/kg, Inj fentanyl 1 microgram/kg, Inj hydrocort 2mg/kg.

Patient was maintained on spontaneous respiration with 100% oxygen by Jackson and rees circuit (bag and mask ventilation) with Inhalational agent Sevoflurane at MAC 2 and IV sedation Inj. Propofol 1.5 mg/kg and it's Infusion at 120 microgram/kg/min started. Oxygen saturation improved to 100%. Tachycardia , respiratory rate, ETco2 settled.

Muscle relaxant was not given to avoid positive pressure ventilation and further propulsion or dislodgement of foreign body which may complicate its removal.

Maintaining all aseptic precautions, Surgeons use paediatric ventilating Rigid Bronchoscope to which ventilatory circuit is attached by 22mm universal connector though which if patient desaturates - positive pressure ventilation is possible. Foreign body (tamarind seed) was removed in multiple pieces largest measuring approximately 1.5 cm × 1 cm. from the location at 1 cm from junction point of trachea and right main bronchus with the help of fine grasper through bronchoscope.

After completing the procedure in 20 minutes , inhalational agent stopped, maintaining spontaneous respiration with 100% oxygen by bag and mask.

Patient was conscious and oriented, maintaining oxygen saturation on room air up to 99%, with normal heart rate and respiratory rate. Shifted to recovery room and vitals observed for half hour.

Then shifted to ward and discharged after completing antibiotic course after 3 days.



propofol and sevoflurane with spontaneous ventilation. *Paediatr Anaesth.* 2014 Oct;24(10):1031-6. Doi: 10.1111/pan.12509. Epub 2014 Aug 22. PMID: 25145573.

DISCUSSION

Foreign body aspiration is the fourth leading cause of death in preschool and younger age children and accounts for a significant number of emergency. The management of non-radiopaque tracheal foreign bodies (FBs) in paediatric patients represents a high-stakes clinical challenge, balancing the urgency of airway security against the limitations of diagnostic ambiguity. The absence of radiopacity necessitates reliance on indirect signs, caregiver history, and subtle clinical clues.

Delayed diagnosis of tracheal FBs correlates with increased complications like pneumonia, atelectasis, emphysema. Post-extraction, close monitoring for complications such as subglottic edema or retained FB fragments proved essential.

CONCLUSION

Non-radiopaque tracheal FBs in children demand heightened clinical vigilance, adherence to evidence-based practices, prioritizing early bronchoscopy and collaborative care that can mitigate morbidity and improve prognosis. The integration of advanced diagnostic modalities, such as low-dose computed tomography (CT) may enhance preoperative localization but less scope in emergency cases as there is minimal time between diagnosis and start of operative procedure

This case shows critical role of maintaining spontaneous respiration during rigid bronchoscopy, a technique that mitigates risks associated with positive pressure ventilation (PPV), such as dislodgement of the foreign body into distal airways, barotrauma. This case is facilitated by judicious anaesthesia, controlled sedation, ensured stable oxygenation while preserving the dynamic visualization of the tracheobronchial tree.

REFERENCES

1. Oguzkaya F, Akcali Y, Kahran C. Tracheobronchial foreign body aspiration in childhood: A 10 years experience *Eur J Cardiothoracic Surg.* 1998;14(4): 388–92
2. Blumhagen JD, Wesenberg RL, Brooks JG, Cottan EK. Endotracheal foreign bodies: Difficulties in diagnosis *Clin Paediatr.* 1980;19:480–84
3. Mahajan JK, Rathod KK, Bawa M, et al. Tracheobronchial Foreign Body Aspirations: Lessons Learned From a 10-year Audit. *J Bronchology Interv Pulmonol* 2011;18:223-8. 10.1097/LBR.0b013e31822386a4
4. Robinson CL, Mushin WW. Inhaled foreign bodies. *Br Med J* 1956;2:324-8.
5. Chai J, Wu XY, Han N, Wang LY, Chen WM. A retrospective study of anesthesia during rigid bronchoscopy for airway foreign body removal in children: