

Decoding a whistled cry: a challenging subglottic foreign body in a child

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Subglottic foreign body removal is one of the challenging tasks for anaesthesiologists as it may cause partial or complete airway obstruction which is a life-threatening condition. We have discussed here a four-year-old child who presented with whistling sounds during breathing to the emergency department. The clinical signs, symptoms, diagnosis and management of a subglottic foreign body are discussed with its subsequent removal requiring tracheostomy following failure with rigid bronchoscopy.

Keywords: child; subglottic foreign body; rigid bronchoscopy; tracheostomy; zero-degree endoscope

Introduction

Accidental deaths among children due to foreign body (FB) aspiration with asphyxiation is one of the leading causes worldwide. Physical actions of the epiglottis and arytenoid cartilages in blocking the airway, intense spasm of the true and false vocal cords to a FB and a highly sensitive cough reflex¹ are not much developed in children, due to which FBs frequently lodge in their airways. Subglottic FBs pose an anaesthetic challenge to every anaesthesiologist. They constitute about 8% of all tracheobronchial FBs.² They need immediate removal either by rigid bronchoscopy which is the preferred method or as some studies have found, flexible bronchoscopy can also achieve a high success rate.³

The present case is interesting to report due to the asymptomatic nature of a large whistle (subglottic) FB with a probable history of swallowing it accidentally. The case highlights the importance of history even in the absence of physical signs in early diagnosis of subglottic FBs and its removal after confirming the location.

Case report

A 4-year-old boy was brought to emergency department by his parents with whistling sounds on respiration for about 4hrs. On examination child was comfortable, his pulse rate was 102/min, respiratory rate 16/minute and room air SpO₂ 99%. There were no signs of respiratory distress and at times conducted sounds of foreign body were heard on auscultation. Patient was prepared for emergency removal of FB. The initial investigations were haemogram – 11.8 gm%, Platelet count–218,000/μl, BT-2.25min, CT-4.10min, chest x-ray PA view and soft tissue neck lateral view- normal.

Anaesthetic management

The patient was taken for urgent rigid bronchoscopy. Child was taken into operation theatre with intravenous line in situ with 22G cannula. ECG, SpO₂ and NIBP were attached with pre-operative vitals, HR-120/min, NIBP-88/52, SpO₂ -100%. He received glycopyrrolate 0.1mg and midazolam 0.04mg i.v. as premedication. Pre-oxygenation was done for 5mins and fentanyl 30ug, and hydrocortisone 50mg i.v. were given and induction was with O₂: halothane in ratio of 100%: 1-2% using a Jackson Rees circuit. Intermittent apnoea technique was employed by giving propofol in graded boluses of 5mg and FB removal was attempted with a rigid bronchoscope during the apnoea period of approximately 1-2mins of duration. It was made sure that at no point the saturation was below 90% in the perioperative period.

During bronchoscopy, surgeon found that FB was lying below true vocal cords. The surgeon tried to

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grasp the FB circumferentially using an optical forceps but was unsuccessful in retrieving it. After multiple attempts plan was changed and tracheostomy stoma was created at tracheal ring 3rd level and tracheostomy tube was kept ready. Child was maintained with O₂: N₂O: Halothane; 50%:50%:0.5-2% and then zero-degree endoscope attached with light source was introduced through the stoma and it was found that FB was lying below the stoma created. Hence tracheostomy tube could not be introduced. Thereafter stoma size was increased and zero-degree endoscope along with optical forceps was introduced from the same stoma and FB was removed under vision in three pieces. Thereafter a 5mm tracheostomy tube was introduced and secured in position, and dexamethasone 1mg intravenously was given. Recovery was smooth and uneventful with post-operative parameters of HR-116/min, RR-20-24/min, NIBP- 90/46mmHg and SpO₂ of 100%. Thereafter patient was shifted to paediatric ICU on T-piece. Tracheostomy tube was kept for 5days in case of developing airway oedema in post-operative period due to multiple attempts made in retrieval of FB. Patient was discharged on 10th post-operative day.

Discussion

Whistles are found to be the most common non-organic and second most common tracheobronchial FB. Symptoms of a subglottic FB include cough which might subside after some time due to fatigue and adaptation.⁴ Stridor and dysphonia are classical symptoms of a laryngotracheal FB. The sub-glottic region in children rapidly develops oedema but the FB in our case caused no respiratory distress. A witnessed choking episode is the most reliable sign of a tracheobronchial FB requiring urgent investigation and management.⁵

Our patient had a plastic whistle with a lumen that was lying in the subglottic region. The diagnosis in our case was mainly based on clinical criteria which was evident by history of whistling sound on forceful respiration, coughing and talking in a short duration of just 4hrs as given by the parents. The presence of a lumen within the foreign body permitted ventilation and the inert nature of the foreign body were the factors responsible for relative lack of symptoms. X-ray studies in our case i.e. chest and soft tissue neck were inconclusive due to the radiolucent nature of the FB. 3-dimensional CT scan is a more sensitive diagnostic modality for FB aspiration in

comparison to conventional radiography and is increasingly becoming the imaging of choice, especially for radiolucent foreign bodies like plastic materials.⁶

Removal of a FB of this region is challenging and may need a tracheostomy as a route for bronchoscopic retrieval if bronchoscopy through the mouth is not possible. Tracheostomy may also be required for remove of subglottic FB larger than the laryngeal inlet to avoid vocal cord injury, sharp objects whose retrieval may lacerate the cords and long-standing FB with granulation tissue that may bleed.⁷ It is important to know the location of FB before placing tracheostomy tube as was done in our case by placing zero degree endoscope through stoma. FBs which is clearly visible on direct laryngoscopy, smaller than the glottic chink and not adherent may be removed atraumatically using a Magill's forceps or optical forceps.⁸ It is helpful to know the construction of non-animate foreign bodies like whistle which may consist of three parts as in this case to ensure complete removal of FB and its realignment thereafter.

The use of more advanced techniques like flexible bronchoscopy, video laryngoscopy and CT-scan could be done wherever possible which may further increase the success rate of identifying the exact location of the foreign body.

Conclusion

Subglottic FB needs urgent bronchoscopy. If unable to remove FB through rigid bronchoscopy by oral route, tracheostomy should be preferred after confirming the position. and thereby its subsequent retrieval.

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