

Case Report

Removal of Bilateral Foreign Body in Bronchi-role of Spontaneous Ventilation

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Abstract

Accidental inhalation of foreign body in the airway of children continues to be a significant cause of morbidity and mortality. The removal of aspirated foreign body by rigid bronchoscopy is a potentially risky procedure with the possibility of foreign body dislocation and interrupted ventilation leading to arterial hypoxemia, bradycardia and cardiac arrest. A team approach by anaesthesiologist and endoscopist is essential to ensure safety of procedure and to prevent intraoperative and postoperative complications. This case report describes role of spontaneous ventilation in removal of bilateral foreign body in bronchi.

Keywords: Bilateral bronchi; Foreign body; Spontaneous ventilation

Introduction

Foreign body aspiration is a common occurrence in paediatric age group less than 4 years all over the globe as they explore their environment orally. About two thirds of the cases occur in the age group between 1 to 2 years of age [1]. Anaesthesia for bronchoscopy is challenging in paediatric patients as the airways are narrower and desaturation is faster compared to adults. Cooperation and communication between the surgeon and anaesthesiologist is the key to safe and successful outcome in such situations.

Case Report

A 2 year old male child weighing 10 kg presented in emergency with breathlessness for the last 12 hours. As per history, the child was playing when he put peanut in his mouth. Immediately the child developed breathlessness and fainted for 5 seconds. After this episode, the child was drowsy and the parents reported in emergency. On

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examination, the child was drowsy with intercostals muscle retraction and active use of accessory muscles of respiration. Respiratory rate was 64/min and heart rate was 142/min. On auscultation, there were bilateral crepitations. Oxygen saturation on room air was 86%. Foreign body aspiration was suspected and bronchoscopy was planned. Child could not be investigated because of emergency and was immediately shifted to operating room for bronchoscopy. In the operating room, standard monitors were attached. Atropine, hydrocortisone and dexamethasone were administered. Anaesthesia was induced with fentanyl 10 microgram and sevoflurane in oxygen. After ensuring optimal bag mask ventilation, succinylcholine 10 mg was given. Rigid bronchoscope was inserted but there was loss of chest expansion. Immediately the bronchoscope was removed and the child was incubated with endotracheal tube of internal diameter 4.5 mm but still we were not able to ventilate the child and saturation dropped to 76%. By this time, patient's spontaneous effort appeared and saturation improved to 91%. Now bronchoscopy was planned in a spontaneously breathing child and anaesthesia was maintained with sevoflurane 2%-4%. Peanut cotyledons were removed from both the bronchi and saturation improved to 98%. Now there was no intercostals muscle retraction and accessory muscles of respiration were not used. Postoperatively the child was nebulised and was discharged after 2 days in a stable condition.

Discussion

In present case, foreign body was present in both the bronchi and with controlled ventilation, it got further pushed down blocking both the bronchi and hence, it was not possible to ventilate the patient. So, we opted spontaneous respiration for bronchoscopy maintaining depth of anaesthesia using sevoflurane.

There is reduction in lung volume and relaxation of bronchial smooth muscle during anaesthesia which leads to compressibility of large airways [2]. Also, muscle relaxation leads to loss of chest wall tone and there is disruption of the forces of active airway inspiration, hence further reducing the external support of narrowed airway [3]. Spontaneous ventilation causes preservation of a larger airway diameter than controlled ventilation.

Similar to present case, Punj et al., have reported foreign body removal in a spontaneously breathing child. These authors postulated that anaesthesia and controlled ventilation resulted in loss of chest wall tone and narrowing of airway diameter, thereby leading to failure of adequate ventilation [4]. Bansal et al., used spontaneous ventilation for removal of a large foreign body near the carina which could not slip into one of the bronchi to allow ventilation on the other side. These authors reported that there was very little space around the foreign body for adequate ventilation. Positive pressure ventilation pushed it further down to almost block both the bronchi and the procedure was successfully carried out under spontaneous ventilation [5]. We used fentanyl and sevoflurane as these are safe and have minimal effect on respiration.

We wish to highlight the usefulness of spontaneous ventilation when foreign body is present in both the bronchi. or a large foreign body is obstructing both the bronchi.

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