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Case report: Anaesthesia for thoracotomy in a child with foreign body in left main bronchus

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Abstract

We describe a case report of a 5-year old girl who presented with foreign body impacted in left bronchus. A sharp foreign body had pierced the wall of left main bronchus making removal by bronchoscopy difficult, and a previous attempt at bronchoscopy had led to clinical deterioration of patient, requiring resuscitation and mechanical ventilation. Patient was subsequently extubated when condition improved.

Anaesthesia for thoracotomy was induced with Fentanyl, Propofol, Atracurium and maintained with Sevoflurane with Oxygen/Air. One lung ventilation was achieved with right endobronchial intubation. Epidural analgesia was used postoperatively. Recovery was uneventful.

Thoracotomy with One Lung Ventilation in a paediatric patient require suitable anaesthesia techniques along with good postoperative pain relief leading to early recovery.

Keywords: Anaesthesia, thoracotomy, child, foreign body, left main bronchus

Introduction

Tracheobronchial foreign body aspiration is a life-threatening emergency frequently encountered in the paediatric population. Early diagnosis and successful removal of the inhaled foreign material is important for effective reduction in complications and mortality^[1]. Tracheobronchial foreign body aspiration is seen most frequently in children under the age of 5 years^[2]. Anatomical characteristics of this age group such as high position of the larynx and epiglottis, narrow airways, along with incomplete development of airway protective reflexes, immature swallowing coordination and inadequate chewing process, make these patients prone for aspiration^[3].

Flexible bronchoscope is gaining popularity for removal of aspirated foreign body localised in airways^[4]. Rarely, thoracotomy is indicated for impacted foreign body not retrievable by bronchoscopy^[5].

Case Report

A 5 years old, 17 kgs, female presented with history of aspiration of LED bulb. Bronchoscopic removal of foreign body was unsuccessful and had led to worsening of patient's condition leading to resuscitation, endotracheal intubation and mechanical ventilation. Patient's condition improved by next day. She was extubated and referred to our centre for further management for removal of foreign body from left bronchus via thoracotomy.

Chest X-ray and computed tomography (CT) were performed. These denoted presence of a foreign body in the left main bronchus. It was piercing the wall of the bronchus and was located in between the aortic arch. Biochemical investigations were normal.

Intravenous (I.V.) access was established on the left hand with a 24G I.V. cannula. Left radial artery was cannulated for arterial blood pressure measurement. Left subclavian vein was cannulated for central venous access. Right femoral artery catheter was also inserted as a safety measure for possibility of requiring cardiac bypass, in case foreign body pierced aorta necessitating extensive surgery.

The child was pre-medicated with IV Midazolam 0.05mg/kg and IV Glycopyrrolate 4ug/kg and anaesthesia was induced with 2ug/kg IV Fentanyl and 2 mg/kg IV Propofol. After confirming mask ventilation, IV Atracurium 0.5 mg/kg was given. Intubation was done with single lumen ID 5 cuffed endotracheal (ET) tube. ET tube was advanced further into right bronchus, and the cuff was inflated.

Auscultation of the chest elicited absence of air entry on Left side. Fiberoptic bronchoscopy confirmed the successful placement of the ET tube in Right bronchus. Patient was ventilated on pressure control mode in closed circuit and maintained with Air: O₂ (50:50) with Sevoflurane (Et Sevoflurane between 1.5- 2.5). Normocapnia was maintained with suitable ventilator frequency and tidal volume.

Intraoperative analgesia was maintained with IV Fentanyl and muscle relaxation maintained with IV Atracurium. Intraoperative monitoring included Heart rate, Invasive blood pressure, central venous pressure, oxygen saturation, end-tidal carbon-di-oxide (EtCO₂), electrocardiography (ECG) with ST segment analysis and oesophageal Temperature.

Patient was given Right lateral position. Left posterolateral thoracotomy was performed. Surgery lasted for two and a half hours. Left bronchus was opened and foreign body was removed. Upon completion of bronchial closure, ET tube was withdrawn in the trachea and both lungs were ventilated.

Epidural catheter was inserted for postoperative analgesia. Blood loss was 150cc and Urine output was > 1 ml/kg/hour during surgery. Ringer's lactate was used as maintenance and replacement fluid intraoperatively.

The patient was reversed and extubated after surgery. She remained haemodynamically stable throughout the procedure.

Later, she had an uneventful course in the hospital before discharge.

Discussion

The incidence of foreign body aspiration has increased in recent years in children less than 5 years of age [2]. Rigid bronchoscopy for removal of Foreign body is still the gold standard, even though flexible bronchoscopy has become more famous [4]. Rarely, thoracotomy is indicated for impacted foreign body which is not retrievable by bronchoscopy [5] as was the case in our patient who worsened during bronchoscopy and needed thoracotomy for retrieval.

In this patient, Radiological imaging was useful in diagnosis as well as pointing the location of metallic foreign body. Use of computed tomography (CT) with virtual bronchoscopy [6] proved useful in preparation of this patient for surgery.

There are documented cases of foreign body requiring bronchotomy [7, 8]. Various techniques of anaesthesia induction, maintenance and ventilation are described for this surgery. The choice depends on the anaesthesiologist's expertise and experience, as well as facilities at their disposal.

There are limited options available for lung isolation in children. Balloon-tipped bronchial blockers remain the 'technique of choice' in paediatric patients, under the age of 6 years [9]. Smallest Univent tube No. 3.5 uncuffed version has outer diameter 8.0mm and is recommended for 6-8 years old [10]. Also double-lumen Endobronchial Tube smallest size of 26F is recommended for 8-10 years old [10].

Hence bronchial blockers are primarily used for lung isolation in children less than 6 years. 5 Fr Arndt Endobronchial Blocker catheter is only suitable if the ETT to be used is greater than 4.5 mm internal diameter [11]. Use of Fogarty catheter is also documented [12]. Use of a 3 Fr

Fogarty catheter up to the age of 4 years and a 5 Fr catheter for 5-12 years old [13]. Since in our case foreign body was impacted in left main bronchus which necessitated bronchotomy, we did not have the option of bronchial blocker as it would dislodge the foreign body and jeopardize surgical extraction. Also the indication for one lung ventilation for this procedure was not an absolute one. The purpose of OLV in this case was to provide better surgical exposure by achieving collapse of operated side lung.

Thoracic Epidural provided pain free patient which aided in extubation on-table. Epidural analgesia can produce better pain relief with minimal side effects. It also attenuates the surgery-induced immune alterations and improve the post-operative recovery in patients undergoing thoracotomy [14].

In our case, fall in oxygen saturation was minimal during one lung ventilation. Right sided cuffed tubes tend to block right upper lobe bronchus with resultant hypoxemia which did not happen in our patient.

No intra operative complications such as, hypotension, bradycardia, or arrhythmias were noted.

Conclusion

Our experience in this case, leads us to conclude that appropriate choice of anaesthesia is essential for outcome of the patient. Endotracheal tube can be used for OLV by advancing it further into the main bronchus. As cited by various studies, epidural analgesia for thoracic surgeries in conjunction with general anaesthesia, is effective and essential in small infants. It reduces surgical stress, decreases anaesthetic requirement, helps extubation on-table with faster recovery.

The findings in this case report are consistent with observations in several randomized control trials that have been cited in literature.

References

1. Clerf LH. Historical aspects of foreign bodies in the air and food passages. *South Med J.* 1975; 68:1449-54.
2. 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.
3. Salih AM, Alfaki M, Alam-Elhuda DM. Airway foreign bodies: A critical review for a common pediatric emergency. *World J Emerg Med.* 2016; 7:5-12.
4. Dikensoy O, Usalan C, Filiz A. Foreign body aspiration: clinical utility of flexible bronchoscopy. *Postgrad Med J.* 2002; 78:399-403.
5. Dixit S, Agarwal R, Kumar N, Verma RK, Krishna V, Sahn JL *et al.* Management of tracheobronchial foreign bodies-experience of cardiothoracic department of cardiology institute. *Indian J Thorac Cardiovasc Surg.* 2011; 27:33-35.
6. Haliloglu M, Ciftci AO, Oto A, Gumus B, Tanyel FC, Senocak ME *et al.* CT virtual bronchoscopy in the evaluation of children with suspected foreign body aspiration. *Eur J Radiol.* 2003; 48(2):188-92.
7. Kiran S, Ahluwalia CS, Chopra V, Eapen S. Bronchotomy for removal of foreign body bronchus in an infant. *Indian J Anaesth.* 2014; 58(6):772-773.
8. Shad R, Agarwal A. Broken safety pin in bronchus - Anaesthetic considerations. *Indian J Anaesth.* 2012; 56:570-1.
9. Hammer GB, Fitzmaurice BG, Brodsky JB. Methods

- for single-lung ventilation in pediatric patients. *Anesth Analg.* 1999; 89(6):1426-9.
10. Letal M, Theam M. Paediatric lung isolation. *BJA Education.* February. 2017; 17(2):57-62.
 11. Purohit A, Bhargava S, Mangal V, Parashar VK. Lung isolation, one-lung ventilation and hypoxaemia during lung isolation. *Indian J Anaesth.* 2015; 59:606-17.
 12. Tan GM, Tan-Kendrick AP. Bronchial diameters in children--use of the Fogarty catheter for lung isolation in children. *Anaesth Intensive Care.* 2002; 30(5):615-8.
 13. Fabila TS, Menghraj SJ. One lung ventilation strategies for infants and children undergoing video assisted thoracoscopic surgery. *Indian J Anaesth.* 2013; 57:339-44.
 14. Yang Chengzhi, Chang Hao, Zhang Tiewa, Liang Chao Li Enyou. Pre-emptive epidural analgesia improves post-operative pain and immune function in patients undergoing thoracotomy. *ANZ Journal of Surgery.* 2015; 85(6):472-477.