



CHIRURGIE THORACIQUE/THORACIC SURGERY

RETRIEVAL OF TUBULAR FOREIGN BODY IN A CHILD USING A FIBREOPTIC BRONCHOSCOPE UNDER FLUOROSCOPY.

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SUMMAR

We present a case of foreign body aspiration in a 10 year old girl. The patient had total intravenous anaesthesia using propofol. The metallic object was removed by fibreoptic bronchoscopy under fluoroscopy with retrograde traction of a biopsy forceps threaded through the lumen. The case illustrates that flexible fibreoptic bronchoscopy (FFB) is an effective alternative to rigid bronchoscopy in children with bronchial foreign body and may be a primary modality of retrieval.

Key words: Foreign body aspiration - flexible fibreoptic bronchoscopy – fluoroscopy - image intensifier.

RESUME

Nous présentons le cas d'une extraction d'un corps étranger chez une fille de 10 ans. Sous anesthésie générale au propofol, l'objet métallique a été enlevé à l'aide d'une fibre optique bronchoscopique sous fluoroscopie grâce à une traction rétrograde par un forceps intra-luminal. Le cas illustre que la fibre optique bronchoscopique flexible (FBF) peut être une alternative efficace en remplacement de la bronchoscopie rigide, chez les enfants ayant un corps étranger intra-bronchique.

Mots-clés : Corps étranger - Extraction - Fibre optique flexible bronchoscopique - Fluoroscopie - Amplificateur d'image

Introduction

Foreign body aspiration is a common problem that often results in life threatening complications. About 75% to 85% of all foreign body (FB) aspirations occur in children younger than 15 years old though mostly under 3 years of age. The removal of FB in children is usually accomplished with use of the rigid bronchoscope. While the rate of retrieval reported using flexible fibreoptic bronchoscope (FFB) in adults approaches that with the rigid bronchoscope, experience with use of FFB is rarely reported in children. This is probably not surprising given the need for general anaesthesia in children and the more critical requirement for adequate control of the airway. We report our first experience with FFB in a 10 year-old child following failure to retrieve the FB with a rigid bronchoscope.

Case report

G. K., a 10 year old female was referred to us with a 3 week history of aspiration of foreign body and associated paroxysmal cough. Examination revealed a healthy child with inspiratory and expiratory rhonchi globally but worse on the left lung field. Chest x-ray showed a tapered metallic foreign body lodged in the distal part of the left main bronchus. An attempt to retrieve the foreign object by rigid bronchoscopy failed due to lack of appropriate forceps. Repeated Chest X-ray confirmed distal migration of the foreign body into the left lower lobe bronchus (Figure 1). The foreign object was later retrieved at another sitting under fluoroscopic guided flexible fibreoptic bronchoscopy.

During the procedure, the patient was placed supine on the operating table. The patient had general anaesthesia using propofol as a total intravenous anaesthetic (TIVA). She was pre-oxygenated for 3 minutes and had 0.08mg of glycopyrrolate intravenous (IV) just before induction of anaesthesia with 50mg of IV propofol and subsequently had TIVA using 20mg/hr of propofol as a continuous infusion via the syringe pump and 2.5mg of pethidine IV. Hundred percent oxygen was administered to the patient via a face mask connected to a swivel adaptor while the patient breathed spontaneously.



Fig.1. Tubular FB located in the left lower lobe bronchus.



Fig. 2. Tubular FB impacted onto tip of FFB after opened biopsy forceps has been locked onto distal end.



Fig 3. Tubular FB immediately after extraction.

Intraoperative monitoring included electrocardiogram (ECG), non-invasive blood pressure (NIBP), pulse oximetry (SpO₂), end tidal carbon-dioxide (EtO₂) and temperature. The flexible bronchoscope was introduced through the port on the adaptor. The bronchoscope was gradually introduced trans-orally down into the left lower lobe bronchus. A biopsy forceps was introduced through the lumen of the hollow metallic foreign body. An image intensifier was utilized to confirm the location of the tip of the biopsy forceps beyond the distal end of the FB. The biopsy forceps was opened and the edges were wedged against the foreign body (Figure 2). Traction was applied in a retrograde direction and the foreign body (Figure 3) withdrawn gradually from the airway into the oral cavity from where it was retrieved with a tonsil forceps. The procedure was well tolerated.

Discussion

The use of flexible fiberoptic bronchoscopy (FFB) was introduced in 1970 by Ikeda². The use of this instrument was first reported in children 29 years ago and it included use in examination of nose, pharynx, larynx and tracheobronchial tree³.

Fiberoptic bronchoscope as an instrument for foreign body retrieval remains controversial as a first line option. Cunanan et al⁴ reported their experience in 300 patients, 130 of whom were less than 15 years of age, with successful outcome in 89% of the cases. Nevertheless, Nicolai⁵, in his paper of the state of the art in paediatric bronchoscopy published in 2000 insisted that FFB was unsuitable for FB removal in children. Our use of FFB in the reported case was instigated by our inability to remove the retained FB in the child at rigid bronchoscopy due to unavailability of appropriate size forceps. The technique we used was inspired by a report by Ng et al⁶, in which a FFB was used to retrieve an aspirated fractured synthetic tracheostomy tube in a 3-year old child. Wong et al⁷ in a case almost identical to our patient used an alligator forceps threaded through the central lumen of an aspirated spring coil in a 5-year old child.

The efficacy of rigid bronchoscopy in experienced hands remains well attested to with retrieval rate of tracheo-bronchial foreign body in 97.2% of cases in a recent report⁸. However there is gradual decline

both in expertise and facilities for rigid bronchoscopy in many centres. In addition, earlier concerns about the use of FFB for FB removal in children due to the need for control of the airway during the procedure has now improved remarkably through the use of laryngeal mask airway (LMA) by many authors^{9,10}. The LMA provides better wall to lumen ratio than an endotracheal tube and permits the use of a larger bronchoscope with larger biopsy port for introduction of the forceps. A report from the Mayo Clinic¹¹ had better clarified the conduct of the procedure conduct for successful use of FFB for FB removal in children. They were successful in all cases in which the FFB was used; the need for appropriate forceps was highlighted as well as technique of "removal en masse", i.e. the removal together of the FFB, the ET tube and the forceps holding the FB, during extraction to prevent dislodgement at the level of the larynx.

The LMA was not used in our case due to non-availability of an appropriate size. However, a trans-oral approach through a face mask was effective in the report of Ramirez-Figueroa¹² with 91.3% successful extraction of FFB in 23 children with FB aspiration. Notwithstanding the foregoing, the need for ready availability of rigid bronchoscope has been emphasized as an essential backup should FFB fail¹³.

Conclusion

In summary, we believe that Flexible Fiberoptic Bronchoscopy is a realistic first option for Foreign Body removal in children especially in our setting of poor instrumentation for paediatric rigid bronchoscopy.

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