



Tracheobronchial Foreign Body Aspiration in Children - A Retrospective Study

KEYWORDS

Foreign body, Bronchoscopy, Tracheo-bronchial tree.

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ABSTRACT A retrospective analysis of Tracheobronchial foreign body in children was done over a period of five years. These children were aged 7 months to 13 years and aspiration was found predominantly in male. Rigid bronchoscopy was performed under general anesthesia in 60 cases of suspected foreign body inhalation, out of which 50 were positive for the same. There was no post operative complications in any case.

INTRODUCTION : Foreign body aspiration is a common problem in children and accounts for an important cause of morbidity and mortality. It is potentially life threatening event and may also cause chronic lung injury if not properly managed. This study analyses the clinical and radiological profile of foreign body aspiration and its management as it requires complete co-operation and good communication between endoscopist and anesthesiologist.

MATERIALS AND METHODS : Medical records of all patients subjected to rigid bronchoscopy from March 2011 to February 2016 in children were studied in Tripura Medical College retrospectively. The following data was collected - age, sex, availability of history of foreign body aspiration, type and location of the foreign body and radiological findings. In all children bronchoscopy was done by Storz rigid bronchoscope.

Anaesthetic management- General anesthesia is always the technique of choice for the removal of a tracheobronchial foreign body. The problems of in many of these cases is that a full stomach. Rigid bronchoscope and cold light source has been used in all the cases.

Goals of anaesthesia –

1. Adequate oxygenation
2. Controlled cardio respiratory reflexes during bronchoscopy.
3. Rapid return of upper airway reflexes
4. Monitoring of pulse, blood pressure, oxygen saturation, E.C.G.

After securing good IV access, all the patients were pre-oxygenated for 3 minutes. Inj glycopyrolate 0.01-0.02 mg/ug was administered IV to decrease secretions and to decrease the autonomic reflexes during airway instrumentations. Children were induced with either Ketamine hydrochloride 2mg ug⁻¹ intravenously or oxygen inhalation 2-3% by facemask. For muscle relaxation succinyl choline 1mgkg⁻¹ was administered. Once the child or adult was apnoeic, the surgeon introduced an appropriate sized bronchoscope and intermittent positive pressure ventilation was continued through the side port of the bronchoscope. Anesthesia was maintained with repeat dose of ketamine or by oxygen and halothane or propofol. Succinylcholine 0.25-0.5 mgkg⁻¹ was repeated whenever necessary. Following the removal of the foreign body, a check bronchoscopy was done for full clearance of foreign body and impact

site for trauma, bleeding. Inj. Dexamethasone 0.4-1mg/kg iv and oxygenation 3L/min was given whenever necessary to prevent postoperative stridor and distress. Patients were monitored continuously by pulse oxymetry and E.C.G.

RESULTS & OBSERVATIONS :

1. Total of 60 bronchoscopies were performed, out of which 50 were positive for foreign body.
2. Most of our patients were between 0-3 years
3. Male children were predominantly affected with male to female ratio of 4:1
4. Common site for foreign body lodgement was right main bronchus followed by left main bronchus .
5. The commonest foreign body was plastic beads. Some cases of foreign body like beads of neck chain, nuts, seed were also seen
6. Common signs were tachypnoea, unilateral diminished breath sounds and ronchi / crepitations.
7. There were no complications during and after procedure. We have not lost a single case in our series.

Different observations are depicted in tables

TABLE 1: Incidence of Foreign body

Foreign body	No. of cases	Percentage
positive	50	83.33%
negative	10	16.67%
Total	60	

TABLE 2: Age distribution

Age group	No. of cases	Percentage
0-3 years	27	54%
4-6 years	14	28%
7-13 years	9	18%

TABLE 3: Foreign body location

Location	No. of cases	Percentage
Trachea	3	6%
Left bronchus	8	15.38%
Right bronchus	33	66%
Segmental bronchi	7	14%

TABLE 4 : Type of foreign body

Foreign body	No. of cases	Percentage
Fruits seed	10	20%
Food particles	5	10%
Beads of neck chain	7	14%
nuts	5	20%
Plastic beads	23	46%

TABLE 5 : Radiological findings

X-Ray findings	No. of cases	Percentage
Collapse	10	20%
Obstructive emphysema	9	18%
pneumonitis	11	22%
Radio-opaque FB	6	12%
Normal	14	28%

DISCUSSION: Aspiration of foreign body by no means is an uncommon occurrence especially in the paediatric age group. The children aged between 0-3 years constitute more than 75% of the foreign body aspiration cases. Furthermore, FB aspiration constitutes 7% of the deaths among the children aged 0-3 years.^{1,8} Gurses et al reported that 84% of the patients were under the age of three.² In our study aspiration was mainly seen in 0-3 years group (54%).

Foreign body aspiration is closely related to age, gender, occupation, socioeconomic status, traditions and customs. Foreign body aspiration is high particularly in developing countries due to inadequate education and negligence.³

There is a consensus that foreign body aspirations occurs mainly in the right main bronchus and its branches due to the anatomical structure of bronchial tree. Tracheobronchial foreign body aspiration is most often observed in the right bronchial system. It is due to the fact that the right main bronchus is shorter, wider and more vertical, i.e. , closer to the trachea than the left. It has been reported in the literature that 49.4% of the aspirated foreign body is located in the right system, particularly in the right main bronchus.^{4,5} Leyla Hasdiraz et al. in their study found that 52% foreign bodies were located in right bronchial system and 36% in left bronchial system.⁶ In our study 66% of the aspirated foreign bodies were located in the right bronchus.

Studies have reported that there might be inevitable negative bronchoscopy. The reported negative bronchoscopy rate in study by Yildirim M et al was 8.5%.⁷ This rate was 16.67% in our study. It has been emphasized in the literature that all patients with the history of foreign body aspiration must undergo bronchoscopy and that negative bronchoscopy is inevitable to prevent the morbidity which may arise from the unnoticed foreign bodies.^{4,8}

Chest X-ray is an important tool to localize foreign body. In a study by Leyla Hasdiraz et al. , atelectasis was seen in 26% cases, radio-opaque foreign body was seen in 15% cases and normal chest X-ray was found in 20% cases.⁶ In our study obstructive emphysema was seen in 18% of cases, radio-opaque foreign body was seen in 12% and normal chest X-ray was seen in 28% cases.

Varieties of objects may be aspirated by children. Leyla Hasdiraz et al. found in their study following foreign bodies dried nuts (45%), dried beans (28.7%) and beaded needle (12%).⁶ In our study we found plastic beads in 46% cases and fruit seeds in 20% of cases.

There are wide ranges of clinical problems among children who are susceptible to aspirate. FB that pass through the larynx usually end up in one of the bronchi and seldom cause life threatening hypoxia. Rarely, as in the reported case, the object may be too large to enter the bronchus and a life threatening tracheal obstruction may occur. The management of inhaled foreign body depends upon the site of impact of the foreign body. Laryngeal and subglottic foreign bodies need urgent intervention in the form of

tracheostomy or urgent bronchoscopy, whereas foreign bodies in the bronchus cause less air way problem. The inhaled foreign bodies can be removed by rigid or flexible bronchoscope. However, the rigid bronchoscope offers good visualization and is the preferred method for foreign body removal even in neonates and children.⁹

CONCLUSION: Accidental inhalation of foreign body in children into the tracheobronchial tree is not an uncommon entity. Removal of tracheobronchial FB requires rigid bronchoscopy and an experienced anaesthetist to avoid unnecessary morbidity and mortality.

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