

Study of anaesthetic management of foreign bodies in airway

Kashinath Shridhar Mahajan^{1*}, Lalit Vasant Patil²

^{1,2}Assistant Professor, Department of Anaesthesiology, Dr Ulhas Patil Medical College, Jalgaon, Maharashtra, INDIA.

Email: lalitvp@yahoo.co.in

Abstract

Background: Sharing of airway by both anaesthesiologist and surgeon poses difficulty in ventilation. Associated oedema and inflammatory changes in tracheobronchial tree predispose these patients to severe bronchospasm. **Aim:** To study the anaesthetic management of various foreign bodies obstructing the airways. **Material and Methods:** A retrospective study consisting of 57 cases with the data made available from medical records of all children posted for rigid bronchoscopy for suspected FB aspiration in a tertiary care centre between June 2014 to December 2016. **Results:** 77.19% patients were between the age of 9 months to 4years and 22.81% patients were above the age of four years. 70.17% patients were male and 29.83% patients were female.

Key Words: anaesthetic management, foreign body.

*Address for Correspondence:

Dr. Kashinath Shridhar Mahajan, Assistant Professor, Department of Anaesthesiology, Dr Ulhas Patil Medical College, Jalgaon, Maharashtra, INDIA.

Email: lalitvp@yahoo.co.in

Received Date: 24/03/2017 Revised Date: 19/04/2017 Accepted Date: 16/05/2017

DOI: <https://doi.org/10.26611/1015227>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
22 May 2017

INTRODUCTION

Foreign body (FB) aspiration is an important cause of paediatric morbidity and mortality and It's common in infants and small children.^{1,2} Sharing of airway by both anaesthesiologist and surgeon poses difficulty in ventilation. Associated oedema and inflammatory changes in tracheobronchial tree predispose these patients to severe bronchospasm.² Hence, it's adequate management is a challenge for anaesthesiologists. While performing the procedures, we used ventilating bronchoscope for ventilation of all patients during bronchoscopy. There are three techniques for ventilation of patient during bronchoscopy. Apnoeic oxygenation with small catheter along side of bronchoscope,

conventional ventilation through side arm of ventilating bronchoscope, and use of venturi injector or high frequency jet ventilator⁸.

MATERIAL AND METHODS

It's a retrospective study consisting of 57 cases with the data made available from medical records of all children posted for rigid bronchoscopy for suspected FB aspiration in a tertiary care centre between June 2014 to December 2016. History regarding the age, sex, definitive status of aspiration, findings of X-ray chest and duration from appearance of symptoms to bronchoscopy also made available. All Preoperative symptomatic treatment received by patient, details of anaesthesia and monitoring were recorded. Type of FB, location of FB, need for tracheostomy, post bronchoscopy complication and their management were also noted.

RESULTS

After analysing records of 57 patients of suspected foreign body aspiration we got following results. In 67% patients here was definite history of aspiration. 77.19% patients were between the age of 9 months to 4years and 22.81% patients were above the age of four years. 70.17% patients were male and 29.83% patients were female (Table 1). Preoperatively patients received

symptomatic treatment like bronchodilator, nebulization, oxygensupplementation and antibiotics, depending upon the presentation. Consent from parents/guardians was obtained before the procedure. All patients were monitored with pulse-oximeter throughout the procedure. Ventilating bronchoscope was used for the procedure. All children received atropine 0.02mg.kg⁻¹ as premedication, 100 % preoxygenation was done. Patients were induced with ketamine 2 mg.kg⁻¹ and suxamethonium 2mg.kg⁻¹ was given. In all patients O₂,halothane and intermittent doses of suxamethonium were given for maintenance of anaesthesia. Hydrocortisone 2 mg.kg⁻¹ was given IV followed by dexamethasone 600 µgm.kg⁻¹. 24hrs⁻¹ in 4 divided doses to prevent postoperative laryngeal oedema. Nasal oxygen was administered in postoperative period to prevent hypoxia. Bronchospasm was treated with xanthine derivatives and salbutamol nebulization.

Table 1: Age and Gender wise distribution of patients

	Variable	No of patients	Percentage
Age	9mths- 4 yrs	44	77.19
	4yrs- 11yrs	13	22.81
Gender	Male	40	70.17
	Female	17	29.83

In 47(82.45%) patients vegetative foreign bodies like peanut, custard apple, gram and turdal, tamarind seed, garlic, chilli, coconut piece were found (Fig.1 and 2) and non-vegetative foreign body ear-ring was found in only one case. Peanut was the FB in maximum cases (39.17%), custard apple seed was another common foreign body (24.46%) observed particularly in the winter season when custard apples are available in market. Due to its big size tamarind seed was usually aspirated by older children above the age of 4years.Negative bronchoscopy was observed in 12(16%) patients in which 10% patients were suffering from acute respiratory distress and 5% patients had chronic respiratory pathology (Table 2).

Table 2: Distribution of patients according to type of F.B

Type of FB	No of patients	Percentage
Vegetative	47	82.45
Pea nut	22	39.17
Custard apple seed	14	24.46
Gram and Tur dal	06	10.07
Tamarind seed	04	07.00
Garlic and chilli piece	01	01.75
Non vegetative (Ear ring)	01	01.75
No FB found	09	15.80

In 15.80% patients foreign body was located in sub-glottic region, in 59.64 % patients FB was in right main bronchus and in 24.56% patients it was in left main bronchus (Table 3). In 33.33 % patients bronchoscopy was done within 72 hours of appearance of symptoms while in 51% patients bronchoscopy was done, after

72hours to one week of appearance of symptoms. In 15.67% patients bronchoscopy was done after one week (Table 4). Twenty percent patients required tracheostomy and 3% patients required bronchodilators, nebulisation and ventilator support in immediate postoperative period.

Table 3: Distribution of patients according to location of F.B.

Location of FB	No of patients	Percentage
Subglottis/ Trachea	09	15.80
Rt main bronchus	34	59.64
Lt main bronchus	14	24.56

Table 4: Distribution of patients according to time taken between appearance of symptoms and bronchoscopy

Time of procedure after presentation	No of patients	Percentage
Within 72 hours of symptoms	19	33.33
After 72 hours to 01 week	29	51.00
After 01 week	09	15.67

DISCUSSION

Presentation of FB aspiration is a triad of coughing, choking and wheeze.² Aspiration of foreign body into tracheo-bronchial tree occurs in all age groups, but infants and small children suffer most commonly.^{1,2,3} In our study also 78% patients were between the age of 9 months to 4years. In presence of persistent wheeze, predominantly unilateral with unexplained persistent fever in spite of treatment, FB aspiration should be suspected. Positive history of aspiration may not be present in all patients.³The habit of patting objects in to mouth and to chew on when teething leads to aspiration⁴. The anatomic relation of the larynx, shouting, crying, playing while eating and lack of parental supervision contribute to hazards of aspiration². Right main bronchus was the commonest site of foreign body.^{1,2,3} Vegetative FBs are known to produce chemical bronchitis, mucosal oedema resulting in acute obstructive emphysema or atelectasis which call for immediate attention.^{5, 6} These FBs get swell by hygroscopic action and may disintegrate in fragments which occlude segmental bronchi⁵. In metallic FBs mucosal irritation occurs but bronchial occlusion takes longer duration⁴. Custard apple seed is one of the important foreign body in our study might be due to availability of custard apple, (Seetaphal) in Marathwada region on large scale particularly in winter season. Inert FBs with smooth surface cause little irritation of mucosa.⁴ Most common x-ray finding is unilateral emphysema or hyperinflation particularly if FB is located in bronchus. Air trapping occurs and mediastinal shift to unobstructed side may be present.⁶ Collapse of lung on one side is seen in FBs of longer duration. Rigid bronchoscopy may lead

to bronchospasm or cardiac dysrhythmias and interference with ventilation⁷. The anaesthetic technique which provides adequate analgesia and muscle relaxation is preferred. An inhalational induction is preferred most of the times because IPPV may push FB distally in to smaller airways or may cause ball valve effect resulting in distal airway trapping. Use of inhalational agents like halothane as sole agent permits instrumentation but it is difficult to maintain depth of anaesthesia for prolonged period.^{7,10} Use of IV inducing agent propofol followed by suxamethonium is most popular technique⁷. Thiopentone sodium or ketamine can be used for induction of anaesthesia³. There are three techniques for ventilation of patient during bronchoscopy. Apnoeic oxygenation with small catheter long side of bronchoscope, conventional ventilation through side arm of ventilating bronchoscope, and use of venturi injector or high frequency jet ventilator⁸. We used ventilating bronchoscope for ventilation of all patients during bronchoscopy. Suxamethonium was used as muscle relaxant. Due to shorter duration of procedure non-depolarizing muscle relaxants were not required.

SUMMARY AND CONCLUSIONS

Proper preoperative preparation and close association of anaesthesiologists, endoscopists and assistants will give good results. Use of controlled ventilation with muscle relaxants and inhalational anaesthesia provides an even and adequate depth of anaesthesia for rigid bronchoscopy. Even though use of venturi for ventilation of patient is the

safest and comfortable but ventilation with side port of ventilating bronchoscope can provide safe and adequate anaesthesia for rigid bronchoscopy which we observed in our study.

REFERENCES

1. Srppnath J, Mahendrakar V. Management of tracheobronchial FBs: a retrospective analysis. *Indian Journal of Otolaryngology and Head and Neck Surgery* 2002; 54:127-131.
2. Sehgal A, Singh V, Chandra J and Mathur NN. Foreign body aspiration. *Indian Pediatrics* 2002; 39:1006-1010.
3. Patel A. Anaesthesia for endoscopic surgery. *Anaesthesia and Intensive care medicine* 2005; 6-7:15-20.
4. Evans JNG. Foreign bodies in larynx and trachea. *Textbook of Otolaryngology by Ian Mackay T.R.* 6th Edition 1997; 6/25/1 To 6/25/11.
5. Agarwal, Parashar V, Parashar S, Sen U, Rai K. Management of FB in tracheobronchial tree. In paediatric age group—A brief review. *Indian Journal of Anaesthesia* 2001; 45:348-350.
6. Narwahi S, Bora MK, et al. FB in bronchus—An unusual presentation. *Indian Journal of Otolaryngology* 2005; 57:161-162.
6. Aitkenhead AR, Smith G. *Textbook of Anaesthesia*, 11th Edition—Ch-38—Anaesthesia for Thoracic Surgery 622-623.
7. Anaesthesia for thoracic surgery. Ch.24—Clinical Anaesthesiology, 11th Edition—CI /Edward Morgen J, Maged S, Mikahail, Michael J. Murray 2002; 544-545.
8. Thomas Jgal. Bronchospasm Ch.16. Complications in Anaesthesiology, Nikolaus Gravenstein, Rober R. Kirby, 11th Edition 206-210.

Source of Support: None Declared
Conflict of Interest: None Declared