TRACHEOBRONCHIAL FOREIGN BODIES: TELESCOPIC APPROACH IN PORT HARCOURT

ABSTRACT

Removal of foreign bodies from the airway, especially in children require special skill and proper instrumentation. In telescopic bronchoscopy airway accessibility is made easy and hence removal becomes less challenging, compared to other methods. Aim of this study is to showcase the telescope in the process of tracheobronchial foreign body removal.

Method

The Telescopic Bronchoscope forms the major armament for this study. This is in contrast to other types of bronchoscope used in accessing the tracheobronchial tree for foreign body extraction. The German Richard Wolf Telescopic Bronchoscope was used. Other components of this instrument include, the light source and light cable for excellent illumination. The fibre optic and rigid bronchoscopes were not used in this study.

Results

24 children under this study presented in University of Port Harcourt Teaching Hospital, either referred from other centres or presented on their own. Fourteen (14) male and (10) ten female with male/female ratio of 1:5:1. Foreign bodies retrieval were groundnut (8%), fish bone (21%), others were plastic toy pieces, screw nuts. The right main bronchus, (61%) recorded the highest lodgement.

Conclusion

Foreign body in the airway especially in children is life threatening. The use of telescope offers excellent armament, preventing mortality.

Keywords

Telescopic Bronchoscope, foreign body aspiration, tracheobronchial tree.

Introduction

Aspiration of foreign body in the tracheobronchial airway, especially in children is life threatening. Airway compromise, followed by respiratory distress resultsin morbidity and in some cases mortality[1]. The use of Telescopic Bronchoscope andendotrachial intubation assures easy removal, preventing mortality which at times follows the use of other methods (Rigid Bronchoscopic procedure, fibre-optic procedure). Frequent de-saturation during the procedure and the delay encountered in process of de-saturation are eliminated, thereby providing speed in the process. Therefore, length of time under anaesthesia and morbidity are drastically reduced. Uninterrupted free flow of anaesthesia gase(s) is ensured as endotrachial tube is already connected to the anaesthetic machine[2].

The Surgeon has more time to search and remove foreign body through this process. The instrument allows for good anaesthetic approach since normal Intermittent Positive Pressure Ventilation (IPPV) is not interrupted.

The aim of this study is to highlight and showcase the use of telescopic bronchoscope in the removal of tracheobronchial foreign bodies in comparison to other methods.

Comment [ɔ.1]: requires

Comment [ɔ.2]: Endotracheal

Comment [ɔ.3]: gas

Patient and Method

This is a 6 year retrospective study of children who presented with airway obstruction from foreign body requiring removal at the University of Port Harcourt Teaching Hospital. The study was betweenSeptember 2014 to September,2020. Clinic and theatre records were utilised and information include age, gender, history of aspiration of foreign body, nature of foreign body, time of aspiration and site of lodgement.

Instrumentation

Instrumentationwas the telescope bronchoscope with general anaesthesia in form of endotrachial intubation, other armaments include light sources and light carrier to provide excellent illumination and clarity of the airway.

Telescopic Instrument

The instrument is a German, Richard Wolf, optique Lumina Telescopic Bronchoscope. It has adult and paediatric sizes.

Ref: 8464,30, SN 5000229228, CE 0124, Size 16 Paediatric. Also Ref 82514,431, SN 5000192374, CE 0124 Size 35 Adult. Both have Lumina barrel forcep, where the optique telescope is inserted and passed down for viewing the airway. The Lumina barrel forcepalso allows metallic orrubber suction tubing to pass for suctioning of the airway. The optique telescope has attachment for light source to proper illuminate the airway. The lumina barrel has forcep at the tip for gasping of any object within the tracheobronchial passage as you advance. These are demonstrated in the picture shown below. Good and functional suction apparatus is an essential component of these armament.

Pictures of Instrument

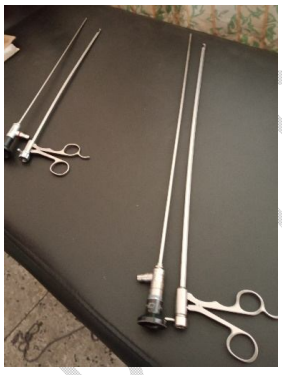

Figure 1: The telescopic bronchoscope

figure 2 :The light source and light cable

Anaesthesia

The anaesthetic management in this section applied to all the patient under this study.They were assessed preoperatively toidentify any associated systemic illness. Premedication with intravenous atropine 0.01mg/kg body weight, paracetamol 15mg/kg, dexamethasone 0.1mg/kg to reduce airway oedema. All prior to induction of anaesthesia.

Induction commenced with ketamine 2mg/kg body weight or propofol 2mg/kg, suxamethanium 2mg/kg. Laryngoscopy performed and endotracheal tube passed. Usually, the endotracheal tube must be less than the normal size to the patient. This is to allow the Lumina

barrel of the telescope pass thorough the rima glottis. (usually size 3.0mm tube preferable). Orotracheal tube passed and secured and ventilation continued.

Results

In this study we had (24) twenty four patients that had telescopic removal of foreign body from the tracheobronchial airway. Fourteen (14) were male, and ten (10) female, with male/female ration of 2:1.

Classical history of choking, coughing bouts before respiratory distress following meal were recorded in majority of them. Others presented because parents suspected inhalation of foreign body.

Table I: Age and gender distribution of patients

Age group	**Male**	**Female**	**Total**	**Percentage (%)**
6-12 months	1	1	2	8
1-2 years	6	4	10	42
2-3 years	3	3	6	25
3-4 years	2	1	3	13
4-5 years	1	1	2	8
5 years and	1	0	1	4

Table II presents time interval between aspiration and presentation. This ranged from (6) hours and (10) ten days and above.

Table II: Types of foreign body aspirated

Time Interval	**Number**	**Percentage (%)**
<24 hours	9	38
1-5 days	12	50
5-10 days	2	8
10 days and above	1	4
Total	24	100

Nineteen (19) presented through referral from other health care providers, while others presented on observing symptoms. Type of foreign bodies removal were recorded on the table III.

Table III: Types of foreign body aspirated

Object Retrieved	No of Patients	Percentage (%)
Groundnut	9	38
Fish bone	5	21
Groundnut shell	2	8
Screw nut	3	13
Eraser	1	4
Toy Plastic Piece	1	4
Cellophane Piece	1	4
Toy Bulb	1	4
No foreign body seen	1	4

Groundnut appear as the commonest foreign body removed, 9 (38%), followed by fish bone 5(21%) and screw nut. Others are eraser, toy materials and toy bulb.

TableIV: Location where foreign body was removal

Position	Number	Percentage (%)
Right main bronchus	14	61
Left main bronchus	9	39
Total	23	100

14 (61%) foreign bodies were located in the right main bronchus, while 9 (39%) were located in left main bronchus. No foreign body was located in one patient.

Discussion

There are two main types of bronchoscopes, the fibre optic and the rigid. The rigid can be further divided into ventilating and venturi type. The method of bronchoscope used to showcases in this study is the telescopic type, which is easily applied and makes anaesthesia and ventilation easy for the procedure, Swanson et al[1].

The use of telescope minimises episodes of desaturation and discontinuity of procedure, which is usually encountered during the use of rigid bronchoscope. The reason for this is that small size endotracheal tube is already insitu at the beginning of the procedure. This ensure uninterrupted ventilation during the process, with sustained adequate saturation.

Male presented more than female, with male/female ratio of 2:1. No demonstrated reason for this, but could be due to increased activity in male children. This clinical condition appear commonest between ages 1-3 years and was also observed by Fidkowski et al, when they reviewed about 12,979 cases of anaesthetic consideration of tracheobronchial foreign bodies[2].

The use of telescopic/endotracheal intubation assembly has advantages over other methods like: Bronchoscopic Anaesthesia-Circuit Assembly, venturi-oxygen air-entraining rigid bronchoscope and flexible bronchoscope [3,4]. In the telescope assembly there is a wider field of view and magnification of the airway objects, better control of the ventilation with virtually absence of desaturation of patient during the procedure. Minimal trauma of airway is also observed [5,6]. Items retrieved from the airway include groundnuts (38%) as commonest, followed by fish bone (21%), screw nuts and pieces of plastic toys as recorded on table III. \

Ezeanolue*et al* had also recorded groundnut as commonest in their (30) thirty cases series that had rigid Bronchoscopy [7,8]. The right main bronchus had more foreign body lodged in the lumen (61%). The left main bronchus had (39%). There was no foreign body in one patient [9].One of the reasons for showcasing this instrument in this study is to encourage centres to acquire the telescope for easy access retrieval of foreign body in the tracheobronchial tree.

More children presented within age one to two (1-2 years) compared to other age group. This could be due to poor swallowing reflexes that had not developed properly in this age group.

Table I: This was also observed by Ezeanolue*et al* in their clinical profile and technique of administering anaesthesia during rigid bronchoscope removal[10]. Majority of patient presented after about five days. The delay in presentation may attract more complication depending on the nature of foreign body.

Groundnut has acidic secretions which will cause oedematous airway with more obstruction [11]. Table III shows the type of foreign body aspirated, groundnut presented more, followed by fish bone.

Groundnut is a common vegetable food item provided at homes and with poor swallowing reflexes, aspiration is common [12]. Fourteen (14) foreign bodies were retrieved from the right main bronchus. This agree with other studies. Anyanwu C.H foreign body airway obstruction in Nigerian children [13,14].

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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