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Original Article

An Audit of Rigid Bronchoscopy

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Abstract

Background: To determine the utility of rigid bronchoscopy in terms of age, sex and seasonal variations.

Methods: In this descriptive study all patients undergoing rigid bronchoscopy were included. The data was analyzed on the basis of age, sex, indication, nature of foreign body and seasonal variations. The patients were divided as per indication of bronchoscopy in individual cases. As regard nature of foreign body, patients were divided into those having metallic and non-metallic foreign bodies. Special stress was paid to evaluate incidence of rigid bronchoscopies in relation 2 main seasons of this part of the world i.e winter and summer. The outcome of seasonal variations in incidence and results of bronchoscopies was analyzed.

Results: Age ranged from 1 year to 60 years. The male to female ratio was equivalent as 10 patients in each group. There were 12 children and 8 adults. The most common indication of bronchoscopy was foreign body(65%). . Out of 13 cases of bronchoscopy for foreign body bronchus 84.6% were children. There were 11 cases of bronchoscopy (55%) in winter season and 45% in summer. Peanut (90.9%) was the commonest foreign body encountered in paediatric age group. There were no complications of bronchoscopy except 2 cases with failure to remove foreign body in first sitting but successfully removed in second sitting.

Conclusion: Foreign body bronchus is the most common indication of rigid endoscopy and majority of the patients are children under the age of 12. The most common foreign body bronchus is peanut especially in winter season.

Key Words: Rigid bronchoscopy, Foreign body nose, Seasonal variation.

Introduction

Rigid Bronchoscopy is a procedure that is used to examine the trachea and main proximal bronchi.It was first used by German ENT surgeon Gustavo Kalians in 1897.Later American Otolaryngologist Chevalier Jackson improved rigid bronchoscopes in a significant manner. In the past rigid bronchoscopy was the sole procedure available for the needful but later on in 1960 Shgitolikida from Japan invented fiber optic or flexible bronchoscopy which emerged as alternate to rigid one. Rigid or inflexible bronchoscopy is usually performed under general anaesthesia. Inflexible bronchoscopy is usually performed under local anesthesia .Fiberoptic bronchoscopy has improved a lot in the recent years. It is used for the diagnostic as well as therapeutic purposes. It can be used with local anesthesia to examine the airway, suction clearance of tracheobronchial tree. It is flexible, easy to use with less chances of injury. As of late, cognizant sedation has come up as the alternate ,but general anaesthesia still remains a standard system..[1]

Rigid bronchoscopy is an old procedure used for various indications in of trachea-bronchial ailments. It is usually performed under general anaesthesia in all age groups.It is a very useful procedure but is also associated with major complications like cardio-pulmonary arrest, injury to tracheo-bronchial tree, bronchial perforation, mediastinitis and pneumonitis. [2]With the advent of fibrotic bronchoscopy, it has replaced the rigid bronchoscopy especially for diagnostic purposes. Fiber optic bronchoscopy is a safe procedure in infants /children serving as an important diagnostic/therapeutic tool in the disorders of respiratory in this age group[3]

Fibrotic bronchoscopy has got its own demerits with known limitations in extraction of foreign bodies and proper biopsies. Standards of rigid bronchoscopy have also improved with the advent of fibrotic lights, ventilating rigid bronchoscopes and installation of telescopes and microscopes with the rigid bronchoscopes,enhancing rigid bronchoscopy utility in various indications of bronchoscopy .Rigid bronchoscopy in experienced hands under general anesthesia is safe /effective diagnostic and therapeutic procedure[2]Fiber optic bronchoscopy is a latest method in little babies and kids. The rigid-bronchoscope is otherwise called an open-tube bronchoscope, straight bronchoscope, or ventilating bronchoscope. It is an unbending, straight, empty metal tube that is accessible in a few sizes.The outer diameter of a rigid bronchoscope ranges from 2 -14 mm, thickness of Bronchoscope wall ranges from 2 - 3 mm, with length from a very short tube in children to a long /extra-long tube in adult.. Most unbending bronchoscopes

are a similar width from the proximal to the distal end,some have a sloped or decreased tip to lift the epiglottis amid intubation. Varieties in the tip configuration likewise encourage the enlargement of airway strictures. Most inflexible bronchoscopes are round when envisioned in cross-segment, with outer side ports that allow the presentation of suction catheters, laser filaments, and ventilation. Rigid bronchoscopes have also been modernized with fiber optic lights, inbuilt forceps with computerized monitors and telescopes.The indications of rigid bronchoscopy are diagnostic and therapeutic. Rigid bronchoscopy is the most effective procedure for the removal of foreign bodies in tracheobronchial tree[4]. The most common indication of rigid bronchoscopy is confirmation and extraction of foreign body bronchus in suspected cases of foreign body bronchus. Although some research workers challenge this but to date it has not lost its worth in this regard.

Patients and Methods

The data of patients undergoing rigid bronchoscopy at BBH Rawalpindi was continuously collected on the case to case basis for one year from March 2011 to March 2012. Those below 12 years of age were included in "paediatric group" and those from 12 and above were included in "adult group". Special stress was paid to evaluate incidence of rigid bronchoscopies in relation to main seasons of this part of the world i.e winter and summer. Total number of bronchoscopies in both seasons were collected and analyzed with regards to age, sex, indications of procedure,type of foreign boy and outcome of bronchoscopies in both the seasons.

Results

Out of twenty patients 10 were male and 10 were female. The age of patients ranged from 1-60 years. Out of 20 patients 60%were in the paediatric group and 40% were in the adult group. The average time of procedure was 10-15 minutes. The indication of bronchoscopy in all the paediatric cases (100%) was foreign body bronchus. In paediatric group 10 patients (83.3%) were below five years of age and 2 above 5 (16.7%) . In majority of the cases the foreign body was in the right bronchus 60% (Table 1). The nature of foreign body in 7 children out of 12 (58.3%) was peanut, chickpea in 2 (16.6%), 1 each child (8.33%) was having rubber, pulse seed and a rare foreign body nail. In winter season 7 children (58.33%) underwent rigid bronchoscopy while 5 (42.67%) children in summer. There were 4 females (57.14%) and 3 males (42.86%). There were 5 patients (45.45%) under 5 years of age and 6 (54.5%) were above 5 years of age . There were 2 females (40%) and 3 males (60%) among those under 5 years of age. In the 4 patients (80%) under 5 years the nature of foreign body was peanut and in one case 20% a nail. The nature of foreign body in children above 5 was variable from peanut to chickpea and pulse seed. In summer season there were 3 (60%) females and 2 (40%) males. All the children (100%) in summer season were below 5 years of age and nature of foreign body was variable from rubber to metallic foreign bodies (Table 2).

Table 1:Bronchoscopy- Demographic Profile

Variable	No(%)	
Total number of patients	20	
Sex	Male	10
	Female	10
Age group	Paediatric	60%
	Adult	40%
Average time of procedure	10-15 minutes	
Incident of foreign body	Right bronchus	60%
	Left bronchus	40%

In adult group there were 8 patients (40%) of the total. Males to female ratio was same as 4(50%) in each group . The age range was 14 years to 58 years.3 patients(37.5%) were below 30 years of age and 4 patients(50%) were 40 and above while one person(12.3%) was 36 years old. Foreign body bronchus was the indication in 37.5%, while carcinoma bronchus, carcinoma postcricoid region and carcinoma hypopharynx were indications of bronchoscopy in other 3 patients(37.5%) and hoarseness of voice and post tracheostomy in rest of two patients making 12.5% in each. The age range of those who underwent bronchoscopy for foreign body was 14-27 years while those undergoing for carcinoma was from 40-58 years.In the group who underwent bronchoscopy for foreign body bronchus 2(66.6%) were lodged in right bronchus and 1(33.4%) was in left bronchus. The nature of foreign body in all (100%) cases was metallic one (Table 3). The seasonal variation showed 4 cases 50% in summer and 50% in winter in all adult cases while in those for foreign body 2 cases(66.6%) in winter and one (33.4%) in summer . There were no complications of bronchoscopy except in 2 cases extraction of foreign body was not successful in first attempt but second attempt proved fruitful

Table2:Bronchoscopy – Indications, age profile and seasonal variation – Paediatric group (n=12)

Characteristic	No(%)	
Sex	Male	5
	Female	7
Age	<5 years	10(83.3%)
	>5 years	2(16.7)
Indications for bronchoscopy	Foreign body	100%
Type of foreign body	Peanut	58.5%
	Chickpea	16.6%
	Rubber	8.3%
	Nail	8.3%
	Pulses	8.3%
Seasonal variation	Winter	58.3%
	Summer	41.7%

Table3:Bronchoscopy – indications, age profile and seasonal variation – Adult group (n=08)

Characteristic	No(%)	
Sex	Male	4
	Female	4
Age (Range=14-58 years)	< 40 years	3(37.5%)
	>40 years	5(62.5%)
Indications of bronchoscopy	Foreign body	36.5%
	Carcinoma	37.5%
	Others	25%
Nature of foreign body	Metal pieces	100%
Seasonal variation	Summer	50%
	Winter	50%

Discussion

The results of this study indicate that rigid bronchoscopy is still an effective procedure in terms of diagnosis and therapeutics. Different entanglements, associated with rigid bronchoscope, include laryngeal edema or bronchospasm requiring tracheostomy or re-intubation, pneumothorax, pneumo-mediastinum, heart failure, tracheal or bronchial injury and hypoxic cerebral damage[5]. Hypoxemia is the most usually watched occasion amid inflexible bronchoscopy. The hazard factors related with intraoperative or with postoperative hypoxemia in unbending bronchoscopy incorporate age, kind of foreign body , term of methodology, pneumonia previously or after system, ventilation mode and span of rising up out of anesthesia.[6] A lot of complications are mentioned in the literature but with a cautious approach it is still a safe procedure with low morbidity and mortality. Rigid ventilation bronchoscopy is safer and effective procedure to remove the mucous plugs and restore pulmonary function[7]. Therapeutic rigid bronchoscopy has become a critical component in the treatment of lung cancer patients with chronic airway obstruction who are not surgical candidates.[8]

The inflexible bronchoscopy is the foremost strategy utilized for extraction of foreign body yet its utilization as a demonstrative instrument suggests a specific rate of negative examinations, presenting the patient to the danger of methodology and anesthesia related entanglements. [9] It is mentioned that CT scan or digital subtraction fluoroscopy must be done to rule out foreign body bronchus but in our setups these facilities are not readily available or they are not affordable, so we have to embark on rigid bronchoscopy.

Present study indicates that rigid bronchoscopy can be employed for a wide range of age group successfully. As no complications were encountered in this wide range so it can be said that rigid bronchoscopy can smoothly and safely undertaken in all age groups. In this series average time of procedure under anaesthesia was 10-15 minutes. The prolongation of anesthesia beyond 30 minutes was associated with complications.[10]

In majority (60%) foreign body was encountered in right bronchus. Right bronchus is the commonest site to be lodged with a foreign body [1112].It is due to anatomical reasons as right bronchus is almost an in line continuation of trachea while left bronchus is lies at an angle. Foreign body aspiration represents an emergency event that requires immediate medical intervention. [13] Foreign body aspiration is a dreadful scenario for the parents and a red alert for the clinician as well as the patients are usually underage children with limited cardio-respiratory reserves and can choke any time. Efficient diagnostics and extraction are imperative for the aspirated foreign body preventing life-threatening complications.[14] In this study 83.3 % percent patients undergoing rigid bronchoscopy for foreign body were below 5 years of age. So in this scenario an anaesthetist well versed with the procedure is required.The nature of foreign bodies in majority of children (74%) were eatables organic in nature. Peanut was most common among the vegetable foreign bodies amounting to 58.3%.[15] Studies showed watermelon seed as most common organic foreign body (39.7%) in Turkey. Betel-nuts (57,84%) and plastic whistles (12,43%) were commonest offending agents, followed by peanuts (11.35%), gram seeds (5.41%), peas (4.33%).[16] The foreign bodies were mostly of vegetative origin like peanuts, beans, grams , while others were plastic objects and beads etc[17]. This difference among our studies is most probably due to prevalence of particular organic matter popularly consumed in different cultures.

In this study majority of children (58.33%) underwent rigid bronchoscopy in winter season and in all of these cases 100% foreign body was peanut. The reason for this specification was that Potohar region is known for the cultivation of peanuts crop and in winter season there is increased in the rate of consumption of peanuts due to high caloric values. The negligence on the part of parents and other family members and lack of public education leads to instillation of peanuts in the mouths of young who inhale them rather to swallow. This is a public hazard and needs proper awareness through media and organizations.

High index of clinical suspicion is mandatory for early diagnosis and management to prevent fatal outcome and long term morbidity.[18] There were no complications of rigid bronchoscopy in present series. Safe and suitable general anaesthesia by an experienced anaesthesiologist is required for complete removal of tracheobronchial foreign body.[19]

Conclusion

1.Rigid bronchoscopy is a safe and effective procedure

2. Foreign body extraction is the commonest indication of rigid bronchoscopy,which is more common in paediatric age group.

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