

Original Research Article

Foreign Body Inhalation in Pediatric Age Group

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Abstract

Bronchoscopic removal of foreign body inhalation is treatment of choice. Development of anesthesia and endoscopic techniques supported by finer ,purposeful instruments and better understanding of the problems made the management easier, safer and surer and mortality claimed to be 1-2% compare to 50% before advent of endoscopy until 1800 foreign body inhalation removed by bronchotomy. over period of 2 years 2012-2014, 230 patient below 5 years received at our department to do bronchoscopy ,190 have definite history of foreign body inhalation proved by bronchoscopy , 40 cases suspected inhalation with persistence of chest infection. The most frequent affected group by foreign body inhalation 5 monthes-2 yearsmale to female ratio 1.8-1 most patient have definite history of foreign body inhalation . Recurrent chest infection with negative history foreign body inhalation needs bronchoscopy . Radiology should be done prior procedure . Bronchoscopy is procedure of choice for foreign body inhalation when a suspected, sometimes it's lifesaving.

Key words: Rigid bronchoscopy, endo tracheal tube, cannula, RCU

الخلاصة

عملية ناظور القصبات تحت التخدير العام هو الاجراء الرئيسي لإزالة استنشاق الاجسام الغريبة وخاصة عند الاطفال اقل من 5 سنة حيث كانت تجرى قبل سنة 1800 م من خلال عملية فتح الرخامي و القصبة الهوائية وبعد 1897م تم اجراء اول عملية ناظور القصبات من قبل العالم كوستاف كنين ومن خلال تطور عمليات الناظور و العناية المركزة و التخدير ادى الى تقليل وفيات استنشاق الاجسام الغريبة عند الاطفال اقل من 5 سنة من 50% الى 1 - 2% . من خلال سنتين من العمل ممتدة من 2012 الى 2014 تم جمع 230 حالة استنشاق الاجسام الغريبة المحالة الى مستشفى الحلة الجراحي 190 حالة كانت مشخصة من خلال اخذ المعلومات من الاهل و مثبتة من خلال اجراء ناظور القصبات 40 حالة مثبتة من خلال استمرار و تكرار التهاب الرئة و عدم الاستجابة للعلاج التحفظي لاكثر من اسبوعين. اكثر فئات الاعمار المصابة هي بين 5 اشهر الى سنتين و اكثرها لدى الذكور من الاناث بنسبة 1.8 الى 1% وان طريقة التشخيص تتم من خلال اخذ المعلومات من ذوي المريض مع الفحص الدقيق ولذ الرقائق الشعاعية وان العلاج الرئيسي لحالات اشتباه استنشاق الاجسام الغريبة تتم من خلال ناظور القصبات الصلب تحت التخدير العام. ان التهابات الصدر المتكررة والغير مستجيبة للعلاج تدعو لإجراء ناظور القصبات الصلب للاشتباه في استنشاق الاجسام الغريبة. نستنتج ان ناظور القصبات الصلب هو العلاج الاساس والمنقذ للحياة احيانا لحالات استنشاق الاجسام الغريبة .

الكلمات المفتاحية: ناظور القصبات الصلب- انبوية القصبة الهوائية -كانونة -الانعاش الرئوي .

Introduction

Historical review:
Until 1800s, removal of tracheobronchial foreign body was achieved through bronchotomy [1]. The first endoscopic removal of foreign body in the tracheobronchial tree was performed

by Custave Killian [2,3].Improvement in anesthetic and endoscopic techniques, supported by finer, purposeful instruments and better understanding of the problems has made the management of the problem

easier, safer and surer, and the mortality is claimed to be 1-2% compared to 50% before advent of endoscope[4].

Foreign body inhalation is the cause of death more than 300 children each year in USA[5].The peak incidence of foreign body inhalation in children, is between 1 - 3 years of age and it will decrease after that [6]. This may related to the tendency of young children to place loose objects in their mouth and this is one of leading causes of accidental death in children below 5 years in age [7], common in male, this ratio is 1.4:1 [7].

Materials and Methods

Over a period of two years extending from April 2012 – March 2014,230 patients referred, to the Department of Thoracic Surgery of Al- Hilla teaching general hospitals underwent bronchoscopic removal of tracheobronchial foreign bodies. In 190 instances, a definite history of foreign body aspiration was obtained and confirmed by bronchoscopy. The remaining 40 about whom such information was unobtainable, and treated for sometimes as if they had a chest infection, were considered suspected cases. Patients with definite history of foreign body aspiration had a penetration syndrome, which is defined as sudden onset of coughing, choking, and gagging with or without vomiting, during eating or holding an object in mouth, followed by stridor or wheezing respiration. Patients with foreign body impacted in larynx or trachea presented with stridor while

impaction on bronchi presented with dyspnea and wheezy respiration. In long standing impacted foreign body patient presented with fever, cough and repeated chest infection [5, 6].Radiology mandatory prior to bronchoscopy, to illustrate the radio-opaque foreign bodies or secondary changes of foreign body impaction like pneumonia or atelectasis. We transfer the patient to the theatre, patient should be properly monitored, well trained nursing staff, proper instruments, are spiratory and cardiac emergencies should be available. Rigid bronchoscopy is the treatment of choice which is done under general anesthesia except in one case with severe respiratory distress. Pulse rate, rhythm and patient color were monitored during the whole procedure until spontaneous breathing and consciousness regained. After completion the procedure, patients then nursed by oxygen tent, intravenous fluid to combat dehydration and acidosis, intravenous antibiotics in long standing impacted foreign bodies and steroid in certain conditions like laryngeal edema. Most of the patients discharged after 24 hours of the procedure if the patient is afebrile and chest X ray is clear. During the procedure, complications can occur such as laryngeal edema and stridor, which was developed in 25 cases treated by hydrocortisone injection successfully, cardiac arrest may occur due to hypoxia, which occurred in 2 patients successfully resuscitated.

Table 1: Age distribution among patients with foreign body inhalation.

AGE	no. of patients	%
< 5 months	5	2.73
5 months- 2 years	119	65.02
2-4 years	40	21.85
4-6 years	13	7.10
6 years +	6	3.30
Total	183	100

The incidence of foreign body inhalation is common in the age group 5 months- 2 years (65.02%) : Sex

distribution of patients with foreign body inhalation with M/F ratio 1.8:1.

Types of foreign bodies		
Organic (vegetable)	y' —	
• Watermelon seeds	91	49.72
• Sunflowers seeds	27	14.75
• Other seeds (rice, orange)	8	4.37
• Nuts (peanuts, almond)	25	13.66
• Others (peas, beans)	7	3.82
Non organic (non-vegetable)		
• Metallic (Pin, clip, screw)		
• Beads	4	2.2
• Foods particles (egg shell, bone)	6	3.2
• Others (pieces of plastic, nylon)	5	2.75
	10	5.4
Total	183	100

Organic foreign bodies were present in 86.3% and the commonest organic foreign body removed was the watermelon seeds (49.72%), second common foreign body removed was the sunflower seeds (14.75) (Table 2).

Distribution of patient according to residence. About 73.2% of patients with foreign body inhalation were from urban areas, however most of those coming from urban areas were of low educational level.

Table 3: Radiological findings in foreign body inhalation

Radiological findings	No.	%
Normal	100	54.64
Pneumonia	28	15.30
Emphysema	27	15.3
Atelactasis	20	10.92
Radio-opaque	7	3.29
Bronchiectasis	1	0.54
Total	183	100

Chest X-ray (mostly posterior-anterior view) was done in all patients in whom foreign body was identified at bronchoscopy. No abnormality was detected in 100 (54.64%).

The most common radiographic abnormality was pneumonic consolidation

which was found in 28 patients (15.30%). Emphysema was seen in 27 patients (15.3%). Atelactasis was seen in 20 patients (10.92%), while bronchiectasis seen in only one patient (0.54%), radio-opaque foreign bodies were found in 7 patients (3.29%) (Table 3).

Table 4: Sites of foreign bodies impaction

Site of foreign body impaction	No.	%
Right main bronchus	109	59.56
Left main bronchus	40	21.85
Trachea	15	8.19
Subglottic	13	7.10
Multiple sites	6	3.28
Total	183	100

The majority of foreign bodies were found in the right main bronchus 109 (59.5%), while 40 (21.85%) were found in the left main bronchus, tracheal foreign

bodies were found in 15 cases (8.19%), and in 13 cases were found in subglottic area. In 6 cases (3.28%) foreign bodies were found in multiple sites (Table 4).

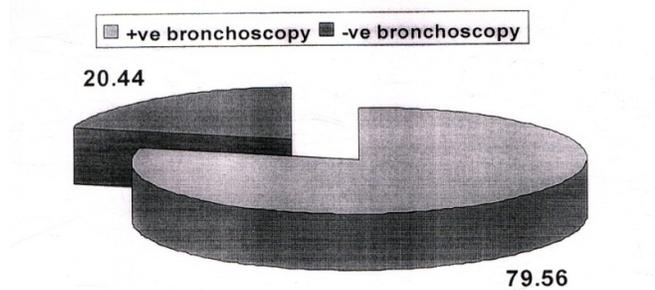


Figure 1: No. of positive and negative foreign bodies according to bronchoscopic results.

Foreign body proved positive only in 183 patients (79.56%) of the 230 patients who underwent bronchoscopy (Fig. 1).

The most common complications is laryngeal oedema (Table 5).

Table 5: Complications after bronchoscopy

Complications	No.
1- Laryngeal edema and stridor	25
2- Cardiac arrest	2
3- Pneumothorax	1
4- Death	0

Results and Discussion

Analysis of 230 patients showed that the incidence in/urban areas is high and this is might be relied to carelessness, negligence and ignorance were responsible for/the most foreign body Aspiration and majority occurred in poor areas and in those who/may not have sufficient knowledge to realize the dangers of such accidents and this is may be higher in occurrence in urban areas than rural areas, because of

low level of education. In most series children predominates especially in the age group / j 1-3 years [1, 2], the common age group involved in foreign body. Aspiration in our study was 5 months - 2 years; 119 cases (65.02%), this is related to increase hand-mouth interaction, increasing independence,/increasing in curiosity in this age, also their inability to masticate well and inadequate control of deglutition and the habit of talking, crying, shouting ,

laughing or playing during meals, all may predispose to foreign body accident. However foreign body inhalation can occur in any age group [8]. In our study, male to female ratio was 1.8:1, which may be explained by the over activity of the male patient.

In our study .190 (82.6%) patients have a definite history of foreign body inhalation (positive history of foreign body inhalation), 167 patients (87.89%) of them proved positive by bronchoscopy. So by bronchoscopy, positive foreign body inhalation was 79.56%. Foreign body inhalation should be suspected in case of chronic chest infection with no response to medical therapy [8] bronchoscopy should be done rather than running the risk of sudden asphyxia and other serious pulmonary complications [6]. There are initial symptoms of coughing, choking and gagging while child eat or holding an object in mouth, later manifestation depends on the nature of foreign body, its size and site and its effect on the lung distal to it, in addition to stage at which the patient is seen [8]. Usually, non-vegetable foreign body afford few symptoms and signs for weeks or months until they become obstructive, causing emphysema or atelectasis and dyspnea, while vegetable types tends to cause an immediate and violent local and general reactions with fever and toxemia [8]. Laryngeal or tracheal foreign bodies cause stridor and indrawing of the anterior chest wall. The sign and symptoms of foreign bodies in bronchi are chiefly those of partial or complete bronchial obstruction (cough, unilateral wheezing and decrease breath sounds). Majority of foreign bodies are often not associated with radiological abnormalities and are difficult to detect [7]. But chest radiography must be taken prior to bronchoscopy to check the nature of foreign bodies, but in radiolucent foreign body can only be suspected from secondary pathological changes produce in the lung such as atelectasis or pneumonia [4], and these changes depend upon the nature of foreign body, duration of inhalation and location with degree of obstruction. In our study 100 cases

(54.64%) showed no abnormalities in their chest radiograph. The next common finding was pneumonia 28 cases (15.30%) other forms listed in table [3]. In cases of obstructive emphysema expiratory chest film proves more valuable in revealing air trapping, while in inspiratory chest radiographs are usually normal [6-8]. In cases of obstructive atelectasis the mediastinum is drawn toward the obstructive side and remain there during both phases of respiration, therefore such inspiratory and expiratory films will show only a slight differences and thus are not so important as in emphysema. In our study, the most common site of foreign body lodgment is the right main bronchus 109 cases (59.5%), the next common site is the left main bronchus 40 cases (21.8%), the rest of other sites are listed in table (4). The causes for predominance of right main bronchus foreign bodies may be the following [3], its greater diameter, its lesser angle of deviation from tracheal axis, midline and the greater volume of air entering the right lung on inspiration.

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