FOREIGN BODY INHALATION IN CHILDREN : DECISIVE FACTORS FOR CARRYING OUT BRONCHOSCOPY

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Abstract: Inhalation of Foreign Body is one of the most common causes of accidental death at home in the paediatric age group. There may not be a clear history of foreign body inhalation and the patient may be asymptomatic at initial presentation. This coupled with the failure of radiological investigations on most occasions makes this a vexing clinical situation. These apparently normal children almost invariably have a bad prognosis if the foreign body is ignored. This study aims to define the most important factors influencing the decision to carry out the definitive surgery, i.e., bronchoscopy, which can be diagnostic as well as therapeutic, based on our experience with 50 cases of suspected FB in the tracheobronchial tree from January 2001 to July 2003. Results from the study suggest that radiological investigations have only limited value in deciding the management of a patient with suspected Foreign Body inhalation. This should not influence the decision to carry out a bronchoscopy, which should rather be based on history and clinical examination.

Keywords: Foreign body in the tracheobronchial tree, auscultation v/s bronchoscopic findings, role of radiology in deciding bronchoscopy

INTRODUCTION

Bronchoscopy refers to endoscopic direct visualization of the tracheobronchial tree. The maximum incidence of inhalation of Foreign Body (F B) occurs below the age of 4 years. FB in tracheobronchial tree also has the dubious distinction of being the commonest cause of accidental death at home in children less than 6 years of age. In this age group the clinical features can vary from being asymptomatic on one hand to producing severe stridor and choking with instantaneous death on the other. Bronchoscopy for diagnostic as well therapeutic purpose remains the gold standard in managing these cases in spite of it being a very skill demanding procedure, the outcome of which depends on many factors, namely, the age of patient, the type and duration of the foreign body, the skill of the Anaesthetist and of course, of the operating surgeon as well as the quality of the available equipment.

This study intends to delineate the different aspects of Bronchoscopy for dealing with a case of suspected foreign body in the tracheobronchial tree with particular emphasis on evaluating the predictive role of pre operative X- ray chest in such cases. This study also intends to correlate the Roentgenographic findings with the site and type of foreign body, the time lapsed since inhalation as well as the clinical respiratory status observed on auscultation.

MATERIALS AND METHODS

This study reports the recent experiences at the department of ENT & Head & Neck Surgery, New Civil Hospital, Ahmedabad while managing 50 cases of suspected FB in tracheobronchial tree from January 2001 to July 2003. During this period, all patients who were suspected to have FB in tracheobronchial tree based upon history elicited or on clinical examination were enrolled for this study. As a protocol all these cases were subjected to pre operative as well as post operative X- ray chest. Respiratory

system was assessed by senior Physician / Paediatrician and the findings noted.

All the cases were subjected to Rigid Bronchoscopy under General Anaesthesia (Chevalier Jackson type). Post operatively all patients were administered IV antibiotics & deriphylline as well as steroids in tapering dose. Post op X- ray chest was carried out in all the patients. None of the patients were subjected to C T scan, as its need was not felt.

RESULTS

The majority of cases in our study were males (70%). Most of the patients were between 2 to 4 years of age (60%), the age ranging from 1 year to 10 years. Definitive history of accidental ingestion was available in 25 cases (50%) while it was suspicious in 22 cases (44%). Thirty of these patients (60%) presented to us within 24 hours of the suspicious incident, though at the other extreme were 2 patients who presented to us after a month.

At the time of presentation, in 72% of the cases (36 patients), respiratory distress was the presenting complaint, though the degree of this was quite variable. Rest of the patients were apparently asymptomatic. Clinical assessment of the respiratory system was normal in a significant minority, i.e. 12 cases (24%). In rest of the patients, decreased breath sounds unilaterally was the commonest finding in which case it was usually associated with bronchial breathing. Completely absent breath sounds unilaterally was observed in 5 (10%) cases only.

Bronchoscopy carried out revealed definite FB in 42 cases (84%). 25 cases out of these 42 had FB in the right main bronchus while 17 had in the left main bronchus. In 6 cases (12%) thick bronchial secretions/ mucus plug were seen to be obstructing the lumen. Suction clearance was done in these patients. 2 cases (4%) had negative bronchoscopic finding.

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BRONCHOSCOPIC FINDING preop auscultation	Definitive foreign body (42)	Mucus plug (6)	Negative finding (2)
(12) Normal	10	2	-
(03) Bronchial sounds only	-	1	2
(30) Decreased breath sounds +/- wheeze +/- bronchial breathing	28	2	-
(05) Absent breath sounds	4	1	-

Vegetable foreign bodies were present in 38 cases out of these 42 patients, ground nut being the most frequently encountered object. Stone, screw, slate pencil & part of tracheostomy tube were retrieved from the rest four patients.

The main radiological findings pre operatively in these cases when related to the time interval and the nature & site of FB and other bronchoscopic findings were as depicted below. Radiology did clearly reveal the radio opaque FB in cases with screw, tracheostomy tube, stone and slate pencil. Translucent shadows of FB in lung field was apparent in 12 out of 38 patients with vegetative foreign bodies. The post op X- ray in all these patients eventually returned back to normal, in most of them within 3 days.

DISCUSSION

Managing a case of FB in tracheobronchial tree has always been a challenging condition for clinicians, requiring the sharpest clinical acumen and the greatest of technical skill for its successful outcome. The endoscope was first utilized in 1897 as before that bronchotomy was in vogue for treating such patients. But the management of such patients was revolutionized by the technique and instruments developed by Chevalier Jackson in 1904.

This condition is primarily seen in young children. The absence of molars for grinding, their tendency to put objects in mouth particularly when playing or running as well as the lack of co-ordination between swallowing and glottis closure are the main reason for this. On aspiration only the large objects get lodged in larynx or trachea, the majority, i.e. 80 to 90% travelling down to the bronchi, with preponderance for the right main bronchus in adults. This situation is different in children in whom many studies have shown equal incidents on both sides.

Carrying out urgent X- ray chest has been a standard practice in such patients, soon after their presentation. Positive signs if present are most commonly seen in the inferior lobe of right lung. The commonest pathognomonic radiological sign mentioned in the literature is migration of the mediastinum, also known as the Holzknecht's sign. Extremely dilated pulmonary tissue with features of emphysema distal to the lodged FB is the second most

RADIOLOGICAL SIGN FACTORS CONSIDERED		Normal 34(68%)	Lobar collapse +/- contra- lateral emphysema 7(14%)	Ipsilateral hyperinflation +/- contralateral mediastinal shift 7(14%)	Consolid- ation 2(4%)
TIME					
Total	(30) <24 hrs	28	1	-	1
(50)	(20) >24 hrs	6	6	7	1
FB Type					
Total	(38)				
(42)	vegetative	29	3	6	-
	(4) Non vegetative	3	-	-	1
Mucus plug (6)		2	1	1	-
Negative B'scopy (2)		-	-	-	1

common sign seen on early X- rays. But in patients presenting relatively late, features of atelectasis or pneumonia predominate.

The conventional method of taking chest X- ray in vertical position is adequate for older children. But in children less than 4 years of age this is unsatisfactory, as it is important to observe signs of ventilatory emphysema in both inspiration as well as expiration. Therefore in cases less than 4 years it has been advocated that the chest X-ray should be taken in horizontal position with the child lying on his side. In this position the lower lung is in a state equivalent to expiration while the lung uppermost to the inspiratory phase. Comparing the X- ray of both sides, emphysematous changes as well as the degree of inflation can be defined.

In our series of patients history was the most important pointer towards the diagnosis of a FB in the tracheobronchial tree, being definite in 25 and suspicious in 22 cases (94%). The next most useful pointer was a proper clinical assessment of the respiratory system which showed abnormal auscultatory findings in 38, i.e., 76% of the patients. It was significant that 12 out of the 48 patients (25%) had normal auscultatory findings.

The preponderance of normal X-ray findings in the majority from whom definitive FB was retrieved (32 out of 42) negates it being made the criteria for carrying out bronchoscopy. But we found that the time elapsed since inhalation was significantly related to appearance of X-ray chest findings. Thus whereas positive findings were apparent in only 2 out of the 30 patients X-rayed within 24 hours of inhalation, it was seen that 14 out of the 20 patients X-rayed after 24 hours had abnormal chest X-rays.

Another notable point was the presence of positive radiological findings in only 9 out of the 38 patients who had an organic vegetable foreign body. In our study both collapse and hyperinflation were found to be equally present on chest X-rays in cases with FB in respiratory tree, while simple consolidation was unhelpful in reaching a definitive diagnosis.

In general removal of FB was technically more difficult in patients who presented late especially after one week which clearly shows the importance of an early decision for bronchoscopy. The post op period was uneventful and O₂ support was needed in only 10% of the patients via a mask. The skill of the assisting Anaesthetists was found to be of great significance in carrying out the procedure smoothly.

CONCLUSION

Cases with suspected foreign body in the tracheobronchial tree can present with normal auscultatory &/or X-ray chest findings. A definitive or suspicious history of FB inhalation should be the most important factor in deciding a bronchoscopy in these patients. The absence of significant post operative complications supports the decision for an early bronchoscopy. Also there is always the possibility of a grave outcome if a FB is ignored. A well equipped endoscopic team headed by a skilled surgeon and assisted by a group of experienced anaesthetists is essential for this. Performing an X-ray chest in these patients at the time of presentation has only a limited value in diagnosis and should never influence the decision for a timely bronchoscopy.

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NEWS AROUND

10th Ratneshwar Dutta Memorial Oration

The **10th Ratneshwar Dutta Memorial Oration** was organized by the Jorhat Academy of ENT Surgeons in collaboration with the Doctors Club, Jorhat. The Oration was held on 27th May, 2006 at Doctors' Club Jorhat. Dr.Kuddush Ahmed, Chief Consultant, Dept. of Head & Neck Surgery, Dr. Baruah Cancer Institute, Guwahati, delivered the Oration. The topic of the Oration was "Management of Thyroid Tumours." On the same occasion Dr. P.K.Saikia. Hony. Secretary, Jorhat Academy of ENT Surgeons, discussed the anatomy and physiology of Thyroid. 50 doctors from Jorhat and neighbouring areas attended the programme, including Prof. R.N. Dutta, the son of the late Rameshwar Dutta.

Uttaranchal State Branch meets for the First Time as full-fledged Body on 28-5-2006

The Uttaranchal State Branch, held its first Meeting as full-fledged State Body on 28-5-2006. Dr. P.S. Saharia was the Guest Speaker. The following were elected as Office Bearers. *President* : Dr. DM. Kala; *Secretary* : Dr. Saurabh Varshney; *Treasurer*: Dr Mohit Kumar ; *Joint Secretary*: Dr.Harish Galgotia. *Executive Members*: Dr. S.S. Bist, Dr. H.C.K. Joshi, Dr. Ashwin Garg, Dr. S.K. Naveen Kandpal.