Tracheobronchial foreign bodies in children

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ABSTRACT

Objective: The objective of this study is to prove that rigid bronchoscopy is a relatively safe procedure in experts' hands and should be carried out in children whenever symptoms like persistent cough, chest infection or stridor persist despite proper antibiotic therapy.

Methods: A review of 534 bronchoscopies in children was carried out between August 1988 and May 1995. Three hundred and fifteen were male and 219 were female children. The most common age was between 1 and 2 years while the mean age being 1 year 10 months.

Results: Out of 534 brochoscopies, 332 were positive for foreign bodies in the tracheosbronchial tree and 202 were negative. The most common site of lodgment of foreign body was the right bronchus. The clinical presentation was variable. An increase in the number of cases was observed. A variety of foreign bodies were encountered, the majority being peanuts.

Conclusion: In our opinion rigid bronchoscopy is a relatively safe procedure and should be carried out in children whenever symptoms like persistent cough, chest infection or stridor persist despite proper antibiotic therapy.

Keywords: Foreign body inhalation, bronchoscopy.

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Foreign body inhalation is common in children which necessitates immediate attention and proper management because of the small size of tracheobronchial tree. The major symptoms such as sudden onset of cough, dyspnea, stridor following a definite history of foreign body inhalation and positive clinical findings should warn the physician that prompt intervention is essential. Aspiration of a foreign body in tracheobronchial tree mainly occurs because of: a) The easy accessibility of different types of nuts and other solids to very young children, b) Lack of proper attention to children in lower socio-economical group.

Foreign body inhalation could be dangerous and may be a cause of unexplained death in children. Definite history, positive findings and radiological evidence are important in confirming the diagnosis although foreign bodies were found in the absence of any of these findings.

Methods. Included in this study were all pediatric patients on whom bronchoscopy was carried out in the ENT Department of the Hawari Hospital, Benghazi, due to suspected foreign body aspiration between August 1985 and May 1995. This hospital serves a population of about 3/4 million in Benghazi and surrounding rural areas. Some of these patients were referred from local pediatric hospitals and many of them were referred to the ENT Department directly.

Selection criteria for bronchoscopy were: Positive history of foreign body inhalation, positive clinical findings, positive radiological findings, and children with persistent chest infection despite adequate therapy.

The bronchoscopy was carried out under general anesthetic with rigid bronchoscope (Carl Storz) and the removal of foreign bodies by means of different forceps under direct vision. A telescope was used on

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few occasions to confirm the foreign body present in the distal part of tracheobronchial tree.

Results. The total number of cases was 534. There were 315 boys and 219 girls. The age ranged from 2 months to 12 years with a mean age of 1 year 10 months. The most common age group was between 1 and 2 years. In age distribution, below 1 year was 24%, below 2 years was 70% and below 5 years was 92%. There were 332 positive cases and 202 negative cases. (Table 1).

The symptoms ranged from persistent cough to severe respiratory distress with all the symptoms of chest infection. Radiological examination was not of much help except in cases with radiopaque foreign bodies such as metal and bones.

The foreign bodies were seen at bronchoscopy 27 in trachea, 198 in the right bronchus and 93 in the left bronchus. In 14 cases, partially obstructing foreign bodies were seen in both right and left bronchi.

A variety of foreign bodies were seen. The most common being peanuts, followed by watermelon seeds (Table 2). In one case, a large plastic foreign body (whistle) could not be removed transglottically and tracheostomy with tracheal slit had to be performed to remove the foreign body. In another case the foreign body was impacted (patient's own tooth) in the distal part of the right bronchus which could not be removed endoscopically. The patient was transferred to thoracic surgery unit where he was hospitalized for about 1 month before thoracotomy. The patient died on the operation table due to a massive hemorrhage. A case of a foreign body was misdiagnosed as pulmonary tuberculosis and was treated for 4 and 1/2 years before the removal of the foreign body, which was a wheat stalk.

Discussion. A very high success rate in the removal of foreign bodies was achieved (321 cases, - 96%) due to improved endoscopic facilities. Fogarty balloon and Dormia basket was used in 3 cases. Out of the remaining 11 cases, 2 required operative intervention and 9 required 2 or more attempts to remove the foreign body.

Table 1 - Total number and distribution of bronchoscopies during the study.

Year	No. of cases	+(%)	-(%)
1988	47	36 (76)	11 (24)
1989	57	32 (56)	25 (44)
1990	68	40 (59)	28 (41)
1991	60	33 (55)	27 (45)
1992	60	39 (65)	21 (35)
1993	78	50 (64)	28 (36)
1994	52	30 (58)	22 (42)
1995	10	6 (60)	4 (40)

Table 2 - Nature of foreign bodies.

Foreign body	Number of cases
Peanuts	218
Watermelon seeds	31
Pumpkin seeds	18
Almond nuts	10
Broad bean seeds	10
Plastic beads	9
Metallic	7
Bones	7
Tooth	2
Others	8

In many studies including ours, the most common foreign body is a peanut, where its extraction could create problems due to its nature i.e. fragmentation can take place, and hence a residual foreign body has to be ruled out at the end of each endoscopy.

Inhaled foreign bodies should be removed as soon as a diagnosis has been made. However, in case of organic foreign bodies infection can take place and this will make it difficult to visualize distally located foreign bodies. In such cases antibiotic treatment and chest physiotherapy will help before rebronchoscopy is carried out.

The amount of local infection (mucosal edema, hyperemia, and secretions) depends on the type of foreign body and duration. The longer the duration, the more severe is the local reaction, and more difficulty in extracting the foreign body.

The use of a telescope can help in cases of distally lodged foreign bodies and facilitate the orientation of the procedure.

Although some studies stress that in the absence of acute respiratory distress, removal of a foreign body is not urgent. In our experience we can't agree with this, because a foreign body in the tracheobronchial tree of an infant is always a potential risk until its removal. A negative bronchoscopy is more acceptable than a complication of an unextracted foreign body.

Conditions under which an aspirated foreign body has to be removed should be optimal by an experienced ENT surgeon, anesthetist and in an operating theatre with proper equipment, except in cases of severe respiratory distress.

As these cases may require prompt removal of foreign body which being in the trachea or near the carina may occlude both bronchi and become life

threatening. Complications of rigid bronchoscopy in our experience were very limited to one case of failure to remove the foreign body transglottically due to the large size of the foreign body and a second cause of foreign body impaction where a thoracotomy had to be performed, there was not a single cause of injury to tracheobronchial tree, surgical emphysema or pneumothorax.

In our study, we noticed an increase over the years in the number of total bronchoscopies. There is an increase in negative bronchoscopies which may be due to the enthusiastic attitude and increased awareness in medical practitioners who are referring cases.

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