

Foreign bodies in the larynx and tracheo-bronchial tree

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Summary

From 1973 to 1982, 40 children with respiratory distress was bronchoscoped for suspected foreign body in the tracheo-bronchial tree. In 31 children, foreign bodies were found and were successfully removed. The condition appeared to be confined to the early toddler group. Six children had pulmonary complications post-operatively. There was no death. A plea is made for early diagnosis and referral to lessen the likelihood of residual pulmonary damage.

Introduction

The drama of a child, blue in the face and gasping for breath, is a scene familiar with every doctor who has worked in the casualty unit for some time. Frequently, no delay is permitted save for a quick history, examination and chest x'ray. The child is pushed into the operating theatre where a careful bronchoscopic removal of an impacted foreign body alters the situation. The purpose of this paper is to highlight that despite a higher standard of parental care and education, children are still allowed access to objects that can be aspirated and despite an improving health care system, patients are still referred late to the hospital.

Materials and Method

Between January 1973 and December 1982, 40 children were bronchoscoped for suspected foreign body inhalation in University Hospital, Kuala Lumpur. Foreign bodies were found in 31 children and were successfully removed. Analysis of these patients form the basis of this study.

Results

Foreign body positive group

There were 24 boys and seven girls. Their ages ranged from seven months to eight years (Fig. 1) with 28 patients (83.9%) aged two years and below. Only three patients were over the age of two years.

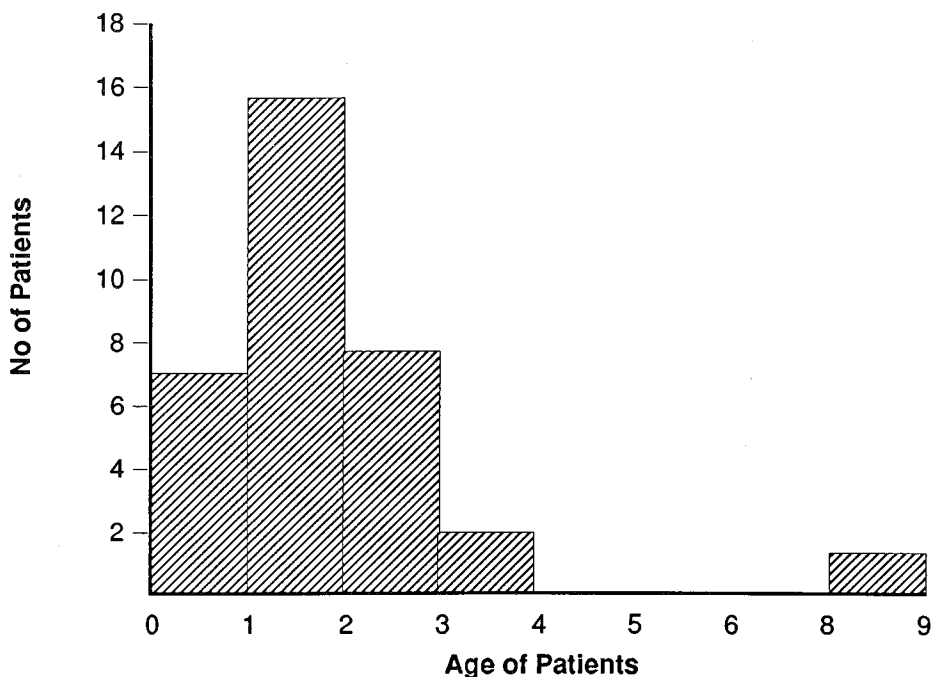


Fig. 1

Age distribution of patients with foreign bodies

Foreign body negative group

In the nine children in whom foreign bodies were not found, one patient had left lung agenesis. Fig. 2 shows the chest Xray of this nine month old boy where bronchoscopy revealed an absent left main bronchus. A diagnosis of left lung agenesis was made after a lung perfusion scan. Three patients had inflammatory conditions of the bronchial tree, while in five patients, a definite diagnosis was not made. The respiratory symptoms subsided spontaneously in three of these patients. One patient had aspiration pneumonia six days after bronchoscopy while one absconded before further investigations could be carried out.

Types of foreign bodies

The most common foreign body was a peanut.^{2,3} This occurred in 14 patients (45.1%). Peanut shells were found in another three patients. The second most common foreign body was a melon seed (Kwa Chee) which was found in eight patients. Fishbones, vegetables and a plastic cap were found in the rest of the patients.

Sites of foreign body enlodgement

The right main bronchus was the site of enlodgement in 15 patients (Table 1). In eight patients with severe respiratory problems, the foreign body was found in the trachea. The left bronchus was the site of lodgement in three patients while in two patients, the foreign body was found impacted in the larynx.

Clinical presentation

In the clinical presentation, a definite history that the child choked while eating was elicited in 13

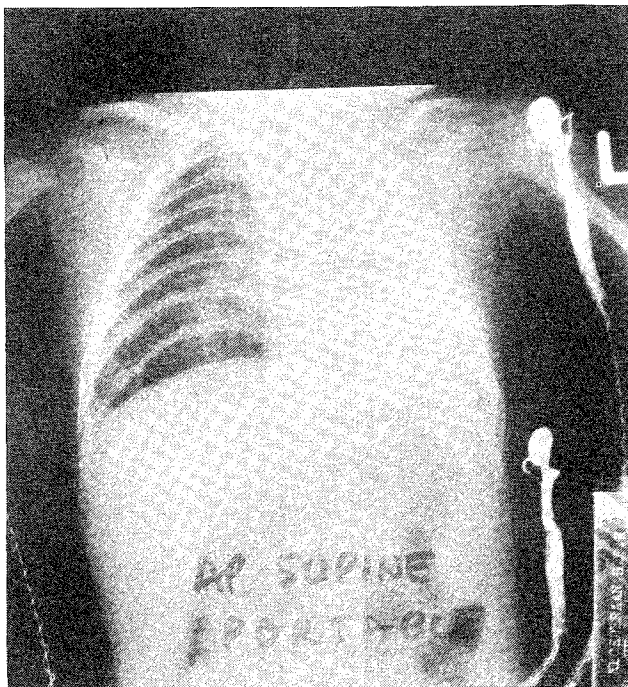


Figure 2

This is the chest Xray of a 9 month old boy who was referred for a foreign body in the left main bronchus with left lung collapse. Bronchoscopy revealed an absent left main bronchus. A diagnosis of left lung agenesis was then made after a lung perfusion scan.

patients. The duration of symptoms ranged from a few hours to as long as three months. Only in ten patients was the diagnosis of foreign body inhalation recognised within the first 24 hours. In seven children, the diagnosis was delayed for more than 10 days. That the child was shunted from one general practitioner to another was a common story, occurring in 13 patients. Three patients even stayed some time in a private hospital. These patients were managed as pneumonia, asthma, and laryngotracheobronchitis respectively.

Wheezing, stridor and cough occurred in the majority of patients (Table 2). Of the respiratory signs, decreased air entry and rhonchi were commonly found. Seven patients had central cyanosis.

Radiographic findings

All the patients had chest Xrays. The common Xray finding was that of unilateral emphysema in 11 patients. Fig. 3a shows the chest Xray of a 1 year old girl 6 weeks after she had inhaled a peanut. Chest Xray after bronchoscopic removal is depicted in Fig. 3b. Pneumonic changes were found in five patients. In three patients, a radio-opaque foreign body was seen.

Table 1

Sites of enlodgement of foreign bodies

	No. of patients
Right bronchus	15
Trachea	8
Left bronchus	3
Larynx	2
Trachea and right bronchus	1
Larynx and trachea	1
Not stated	1

Table 2

Clinical presentation of presence of foreign bodies

	No. of patients
Wheeze/stidor	23
Cough	14
Fever	8
Dyspnea	7
Cyanosis	7
Decreased air entry	13
Rhonchi	7

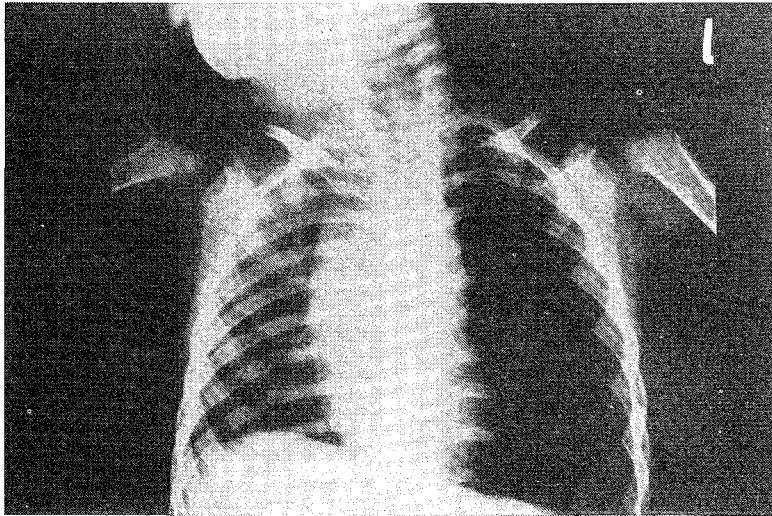


Figure 3a

CXR of a 1 year old girl 6 weeks after she had inhaled a peanut.

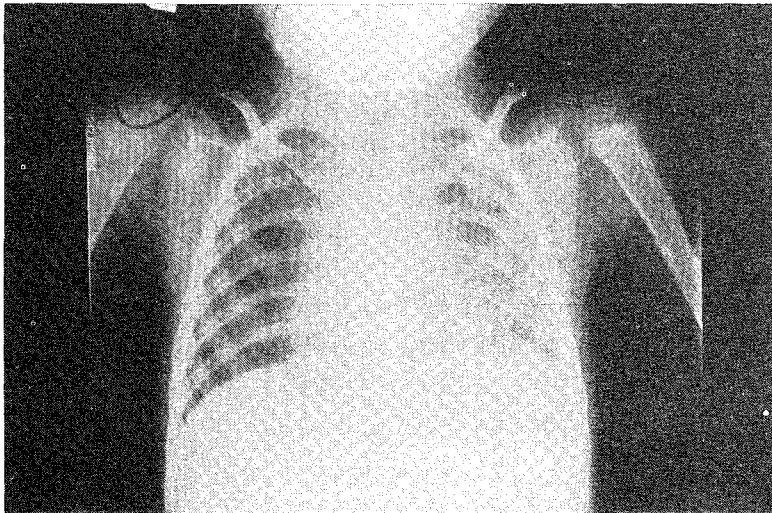


Figure 3b

CXR of the same patient after the peanut was removed.

12 patients had normal chest X rays.

Treatment

All the patients with suspected foreign body inhalation was bronchoscoped under general anaesthesia. In two children, the first bronchoscopic removal was unsuccessful. A second bronchoscopy was required before the foreign body could be removed. The method most favoured was the use of a pair of crocodile forceps. In seven patients, the Fogarty catheter used.

Complication

Six patients (20%) had post-operative complications. Chest infection occurred in two children. Persistent wheezing occurred in another three patients. This subsided after a variable period of time. One child required a second bronchoscopy to remove a residual foreign body. There was no death in the 31 patients.

Discussion

Despite an improving child care and education system, foreign body inhalation continues to be seen in the casualty unit. Their presentation is often dramatic, most cases requiring urgent surgical intervention. The toddler is most often the victim, with his burning curiosity to touch all things and to put all things into his mouth.⁴ Parents must be taught to keep tiny objects away from the toddler. In the local context, allowing the child to eat peanuts is surely the thing not to do. Having inhaled the foreign body, what is really disturbing in our review is that only one-third of the cases were diagnosed and referred to a hospital within the first 24 hours. Indeed, more than half were not picked up until after the first week was over.

The diagnosis of a foreign body inhalation must be excluded in any child who presents with an acute onset of a wheeze without a previous history of asthma or cardiopulmonary disease.³ Much unnecessary morbidity could then be avoided. Failure to remove a foreign body may result in pneumonitis, lung abscess, bronchiectasis, pulmonary haemorrhage, bronchial oedema and perforation.

The earlier the diagnosis and treatment, the less is the likelihood of residual pulmonary damage. As with other series,^{4,5} the commonest site of lodgement is the right main bronchus. Where the foreign body is found in the larynx or trachea, symptoms tended to be more severe. We find the chest Xray the most useful investigation. Abnormal findings occurred in two-thirds of the cases. However, normal plain chest Xrays do not exclude the diagnosis.

Once suspected, bronchoscopy is mandatory. In a child, general anaesthesia is employed. The exact method of removal is left to the ingenuity of the surgeon. The conventional bronchoscope of small size allows only a limited vision, and frequently on visualising the foreign body, grasping of the objects takes place blindly. A recent advance is the use of the Fogarty catheter, which is passed through the instrument channel, and threaded in under direct vision to beyond the object. Inflation of the balloon and withdrawal allows dislodgement and removal of the object. We have used the method successfully in seven patients. This is a simple and safe method, and should be used more often.

Complications are unavoidable in cases that are long delayed. We had two cases of severe chest infection and three cases of persistent wheezing. The latter is believed to be due to an allergic type of reaction of the bronchus to the organic oils of the peanut, or to oedema at the site. A second bronchoscopy to remove a residual foreign body was required in one patient. This is indicated if the post-operative chest Xray is still abnormal or if the child is still wheezing.

References

1. Saw, Ganendran, Somasundaram. Fogarty catheter extraction of foreign bodies from the tracheo-bronchial trees of small children. *The Journal of Thoracic and Cardiovascular Surgery* 77, 1979 240.
2. Cohen, Lewis, Herbert Geller. Foreign bodies in the airway. Five year retrospective study with special reference to management. *Ann. Otol.* 89: 1980 437
3. Fearon. Inhalation of foreign bodies by children. *CMA Journal* Jan 12, 1980, Vol 122 440
4. Rothmann and Bockman. Foreign bodies in the larynx and tracheo-bronchial tree in children. *Ann. Otol.* 89: 1980 434