ASPIRATION OF FOREIGN BODIES AMONG CHILDREN

Aydın Aytaç, M.D., FACC,* and Özdemir Dokumacı, M.D.**

Aspirations of foreign bodies generally occur among children and may be very serious, even fatal, if not diagnosed early and treated properly. If the foreign body is large enough to cause a complete obstruction of the trachea, death may be immediate. Smaller foreign bodies may cause death by acute spasm of the vocal cords and larynx. Choking, gagging and coughing, with subsequent wheezing are the usual symptoms of the initial episode. Even if the patient is not treated during this episode, a symptomless period may follow. However, coughing and fever will develop again and remain until the foreign body has been removed. If allowed to remain too long, bronchitis, pneumonia and bronchiectasis may develop.

A clear history is in itself indication for bronchoscopy to confirm a diagnosis. In 97 per cent of the cases seen at Haecttepe Children's Hospital, diagnosis was made on the basis of history alone.

Chest x-ray is helpful in diagnosing aspirations of radiopaque objects, as it reveals their nature and location. Unfortunately, very few aspirated foreign bodies are radiopaque. Also, if there is total obstruction of a bronchus, atelectasis of the distal area will be seen on the x-ray. If there is partial obstruction, emphysema, caused by the ball-valve action of the foreign body, may be seen.

Localized wheezing on auscultation is the most important single physical finding. Other symptoms vary with the size and location of the object and the length of time since aspiration. In mild cases there may be no symptoms at all. In moderate and severe cases there may be retraction of the chest wall, dyspnea and cyanosis.

Treatment

If there is a clear history of aspiration, or if the child is in obvious respiratory difficulty, bronchoscopy should be performed as

From Ankara University Hacettepe Medical Center and Hacettepe Faculty of Medicine.

* Assistant Professor of Surgery.

** Senior Resident in Thoracic Surgery.

quickly as possible. If, after removal of the foreign body, breathing is still not sufficient, a tracheotomy should be performed. If there is little or no respiratory distress and several days have elapsed since aspiration, there is no need for an emergency bronchoscopy. In such instances, it is better to start the patient on wide-spectrum antibiotic therapy and to perform the bronchoscopy at a suitable time.

Material

The present study is based on 105 cases of foreign body aspirations seen among children at Hacettepe Medical Center, Department of Thoracic Surgery, in the past two years. Bronchoscopy was performed in each case and foreign bodies were found in 103 of the patients. If there is even the slightest suspicion of aspiration, bronchoscopy is performed as a routine procedure at Hacettepe. Locations of the foreign bodies are given in Table 1. Aspirated objects tend to lodge themselves in the right main bronchus because of its position.

TABLE 1

LOCATION OF ASPIRATED FOREIGN BODIES

Location	Number
Trachea	12
Right main bronchus	63
Left main bronchus	22
Right and left main bronchi	5
Trachea and right main bronchus	1
Total	103

The group under study comprised 67 boys and 36 girls, with an average age of 2.95 years. Aspirations occur most commonly in the two to four year old group. Our youngest patient was three months old, and the oldest was twelve years of age. Eleven (9.3 per cent) of our patients were under one year of age. The longest elapsed time between aspiration and removal was 14 months.

The kinds of objects aspirated by the patients in this group are listed in Table 2. Watermelon seeds are very common in Turkey and are especially available during the summer months. We have removed these seeds from as many as four children in one day.

TABLE 2
ASPIRATED FOREIGN BODIES FOUND IN 103 CHILDREN

Object	Number
Watermelon seeds	38
Beans	14
Chick peas	8
Nuts	7
Chestnut	5
Charm beads	4
Plastic letters	3
Sunflower seeds	3
Prayer beads	2
Leaves	2
Chopped nuts	2
Chestnut shells	2
Diphtheric membranes	2
Nut shells	2
Plastic whistles	2
Piece of wood	1
Hazel nut	1
Raspberry seed	1
Nail	1
Cherry pit	1
Oats	1
Stone	1
Total	103

There were four deaths in the group studied (mortality rate of 3.8 per cent). One child died a few minutes after arriving at the hospital. Autopsy showed that both right and left main bronchi were obstructed by the two halves of a peanut which the child had aspirated. No child died during bronchoscopy.

Three patients died a few days after tracheostomy was performed. These patients were brought to the hospital sometime after aspiration had occurred, and all had severe respiratory distress necessitating the tracheostomy. Advanced pulmonary infection was the main cause of death in these cases.

In one case, the foreign body, a bean was removed by thoracotomy because of total atelectasis of the right lung. This child made an uneventful recovery.

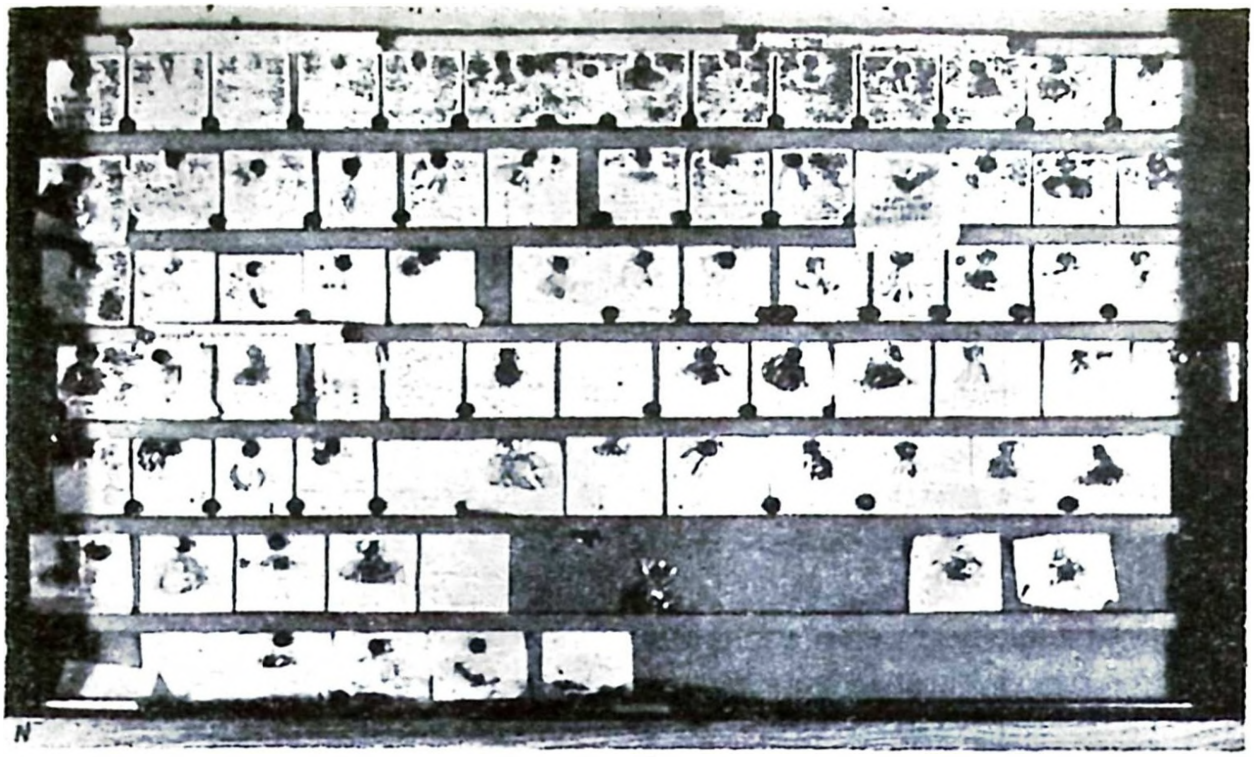

Figure 1. Foreign bodies removed from children at Hacettepe Medical Center.

Discussion

The dangers of bronchoscopy are minimal compared to the grave risk of leaving a foreign body in the child's respiratory system. Therefore, if there is any reason to suspect that an object has been aspirated, bronchoscopy should be performed. History is the most important single factor in diagnosis and is, in itself, enough to indicate bronchoscopy regardless of signs and symptoms. Bronchoscopy can also be used to eliminate the possibility that a foreign body has been aspirated.

Summary

Of 105 children brought to Hacettepe Medical Center in the last two years for removal of aspirated foreign bodies, 103 actually had aspirated an object. The authors stress the desirability of bronchoscopy to locate and remove the object.