

Aspiration of foreign bodies – complications

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Tracheobronchial foreign body (FB) aspiration in children is still a life-threatening situation. To avoid a disaster an effective teamwork between endoscopist and anaesthetist is necessary. To use a good defined protocol, preoperative diagnostic examination and skilled staff and last but not least proper postoperative patient care are inevitable.

In the USA, estimates indicate that foreign body aspiration is fatal in 500-2000 children each year (Aytac, 1977, Limper, 1990).

The most serious complications from foreign body aspiration include respiratory distress, asphyxia, cardiac arrest, fever, laryngeal oedema, pneumothorax, bronchiectasis and bronchial stricture (Limper, 1990)

Fig.1. Peanut in the left main bronchus



Most foreign bodies become lodged distal to the larynx and trachea in the right main stem bronchus. Reasons for that comes from the anatomy: the diameter of right bronchus is larger than the left, the angle of divergence is smaller on the right and even the airflow through the right lung is greater than through the left. In spite of that, several times the foreign body is located in the left bronchial system meaning more difficult task for medical personnel. (fig1.)

Sometimes there are not only one but more foreign bodies in the lungs. That is the reason for after a successful extraction doctor has to check again the whole airway so as not to leave pieces behind.

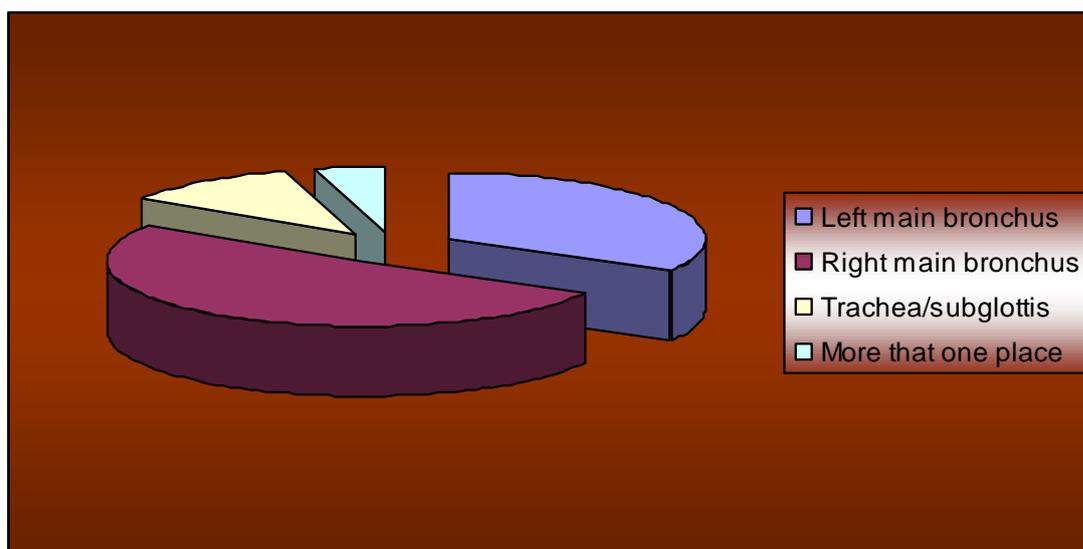
Material and method

In a 10 year period (1993-2003) in Heim Pál Hospital for Sick Children we had 69 patients with airway foreign body aspiration. In Budapest, there are 4 pediatric hospitals on duty for these cases in 7 days a week, 24 hours a day. The population of the city and surroundings is about 2,5 million people (500 000 children).

Rothmann (1980) described that in his material the male-to-female ratio was 2:1; in our series (10 years retrospective study) 39:30 ratio has been counted.

In fig.2. anatomical sites of foreign bodies in our series are demonstrated. From the total of 69 cases 35 foreign body was found in the right main bronchus, 23 in the left main bronchus, 8 tracheal (subglottic and distal) region, and in 3 children there were more than one pieces in different places.

Fig.2. Anatomical sites distribution of foreign body aspiration in 1993-2003
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The other important point the item of aspiration. An organic FB can be more dangerous because of osmotic gradient they can grow and make a total obstruction in the bronchial system. In table 1. the type of FB is demonstrated.

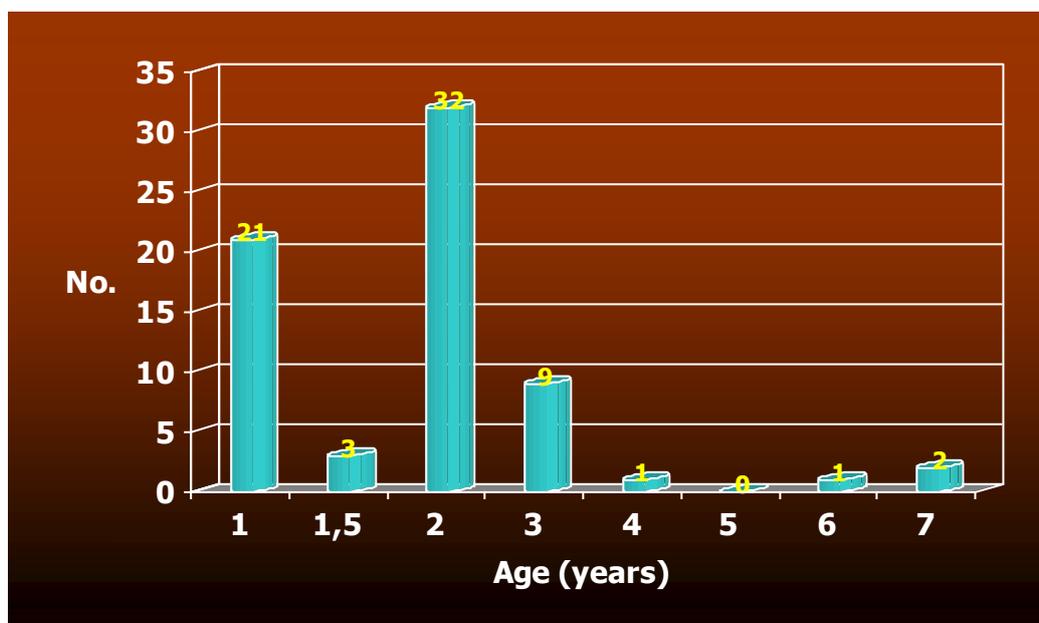
Table 1.

| Type of foreign body | No. |
|---|-----|
| Peanut | 37 |
| Nut | 9 |
| Carrot | 5 |
| Bone | 9 |
| Inorganic thing (metal, rubber, needle, etc.) | 7 |
| Other | 2 |

Age: Foreign body aspiration is most common in children ages 6 month to 4 years. Children in this age group are exploring their surroundings and placing objects into their mouths (Tan, 2000).

Age distribution in our series is seen in the figure 3.

Fig.3. Age distribution of children with foreign body aspiration in 1993-2003
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In normal course aspiration has characteristic signs and symptoms. It may present with sudden onset of coughing, difficulty in breathing, wheezing, or stridor while eating a meal. Unfortunately, a history consistent with foreign body aspiration is usually available in only 70% of patients (Toliver, 2004). If the obstruction is partial (in most cases), after the acute episode of airway distress, patients may become asymptomatic. In our series the positive anamnesis ratio was 82%.

To avoid complications a good organization, proper team work with anaesthetists is essential. Although radiology can be helpful in diagnosis, but according to Svedstrom data (1989) chest X-Rays alone neither sensitive nor specific enough to exclude tracheobronchial foreign bodies.

Helical CT using narrow window and MRI are more accurate, but even in negative results if clinical suspicion remains high, endoscopy should be performed for definitive diagnosis and treatment. To avoid complication is necessary to do regular training for medical staff with imitating the situation in removing FB from a plastic tube and different material. Flexible endoscopes are used for diagnostics only; rigid types are preferred for FB removal in children. Babin (2004) suggested Fogarty's catheter in special cases, which can be useful.

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