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# ANAESTHESIA IN BRONOCHOSCOPIC REMOVAL OF INHALED BODIES. REPORT OF 173 CASES.

V. Shaikholeslami

In Iran inhaled foreign bodies, especially in children are not rare. Their nature and localisation depends on age, and sex. As it is shown in table 1. Water melon seeds are inhaled much more often than other foreign bodies in Iran.

| foreign bodies | 5 months –2 years | 2 years –4 years | 4 years –6 years | 6 years –8 years | 8 years –12 years | total |
|---|---|---|---|---|---|---|
| melon seeds | 53 | 15 | 28 | 5 | 1 | 102 |
| bone | 2 | 3 | | | 10 | 15 |
| leash | | | | | 12 | 12 |
| pin(dress) | 4 | | 1 | | 3 | 8 |
| pumpkin seed | 3 | 1 | 4 | 1 | 1 | 10 |
| bean | 1 | | 3 | | | 4 |
| nail | | | | 1 | 2 | 3 |
| coin | | | | | 2 | 2 |
| safety pin | 1 | | | | 1 | 2 |
| thumb pin | 2 | | | | 4 | 6 |
| cap of pen | | 3 | | 1 | 1 | 5 |
| lead | | | | | 1 | 1 |
| button | | 2 | | | 1 | 3 |
| | 66 | 24 | 36 | 8 | 39 | 173 |

*Table 1*

Table 1 -Shows the number of the patients which inhaled various foreign bodies in different ages.

A study in bronchoscopic experience for removal of inhaled foreign bodies have been done with 173 patients aged 5 months up to 8 years under general anaesthetic during three years (1973-1976) in Razi Medical school, Tehran University (1).

In 25 patients the foreign bodies were lodged in the larynx, in 46 patients it was stuck in the traches and 102 in bronchus (in which 83 were in the Right bronchus).

Anaesthesia for these situations are more complicated and dangerous, first because respiration may be serious by the presence of the foreign bodies, and second, because the use of an endotracheal tube will not be possible. Removal of foreign bodies depends deeply on' excellent anaesthesia which produce immobilisation in uncooperative patients. It is most dangerous for a patient to strain at any time because serious damage can be caused by the surgical instrument.

An anaesthetist must choose a technique whereby the airway is not blocked and effective ventilation and adequate oxygenation ensured throughout the procedure.

Certain points which may cause bleeding, aspiration, or obstruction should be important. The pulmonary function and ventilatory reserve are low and the insertion of the bronchoscope into the bronchus of a diseased lung may reduce ventilation to a level where life may be endangered(2).

*General anaesthesia:*

Premedication: all children had Atropine 0/1 mg per year i.m. Induction: anaesthesia induced with inhalation 50% N20, 50% 02 and 2% Halothane using modified T piece system in children up to 5 years and Magill System over 5 years. When reflexes and sympathetic activity are depressed we change our agents to only Ether for 5-10 minutes to establish a good relaxation, analgesia and a deep anaesthesia in which manipulation of the airway does not activate primitive reflexes. Then patients' vocal cord, trachea and carina are sprayed with 4% xylocaine.

As soon as children were bronchoscopied the ether and oxygen were delivered by the arm side of the bronchoscope, but if the bron-

choscope has no arm side, the oxygen and Ether were given by a catheter, but recently by a spinal pucture's needle, which has been flexed and fixed to the top of the bronchoscope's side.

During anaesthesia the anaesthetist who is standing on the left side of the patient, can monitor the left side of the chest with the stethoscope at all times and a pulse monitor should also be attached. A light is used for determination of the patient's colour. We are very pleased with this method.

## Discussion

Many methods of anaesthesia have been advocated for bronchoschopy, including those using:

*1) Open circuit-*

In this method induction of anaesthesia is with cone ethylchloride which follows by drop Ether for removal of foreign body. From air passage and then continued by inssuflation. In this method the most important point for anaesthetist to note, was the danger from respiratory obstruction by inhaled material of vomiting i.e. asphyxia. If ether is properly administered these dangers disappear. In spite of pungency, ether is not 'irritant' to the lungs and ingerious to mucosa of the upper airway or alveli. All endoscopy instruments should obtain their lights' source from a 6 volt batterybox, never from a wall plug of the main electric power supply.

*2) Spontaneous respiration-*

This is the method which we have used in our practice. We used induced anaesthesia with 2% Halothane and 50% $N_2O + O_2$ and continued ether and oxygen only. With spontaneous respiration, we don't use muscle relaxant (4) because it does introduce the hazards associated with respiration, paralysis, which is here complicated by the presence of the bronchoscope. Endoscopists are very pleased with this method and they remove the foreign body successfully.

We should insist that spontaneous respiration is very important because of valvular Emphysema (5) which is the commonest radiological finding in 90% of patients during the 24 hours after inhalation a

foreign body. In radiological findings, unilateral hyperaeration of the lung would be seen. The lung being distended, it will be perfused but not ventilated resulting in venous admixture.

The foreign body such as melon seed's external cover, acts like a flap which permits the air to enter into the small bronchus and alveoli but they can not come out because of this valve. If we use IPPV we make the severe over-distension which affects the cardiovascular system.

*3) Intermittent positive pressure (IPPV) or apnoeic oxygenation insufflation.*

In this method induced paralysis may be employed by using intravenous short acting muscle relaxant(6). Thiopentone is injected iv to the premedicated patient and succinylcholine is used, maintaining respiration by external chest compression external cuirass plus intter-mittent lung expansion via the arm side of the bronchoscope. This causes air to enter air by venturi effect or by use of the Sander's injector, thus an intermittent flow of oxygen via a small tube in the mouth of the bronchoscope produces inflation of the lungs despite open proximal end.

## Results

This is the resume of a suvey involving 173 foreign bodies in the air passage of children between 5 months and 8 years in Amir Alam Hospital in Tehran.

All the foreign bodies in the air passage were removed by means of bronchoscopy under general anaesthesia. The technique in our department was inhalation with 50% $N_2O$ + 50%$O_2$ and 2% Halothane and maintenance was with Ether +$O_2$ from the arm side of the bronchoscope or a catheter. Spontaneous respiration was induced because respiration would make the distended Emphysema worse and affect the cardiovascular system. This is more important when foreign bodies like melon seeds act as a flap which entraps the air and IPPV or controlled respiration make it worse, causing severe overdistension

which affects the cardiovascular system. We are very satisfied with this method and the surgeons are very pleased.

We never had an explosion during our 8 year's experience.

It should be mentioned that in extreme situation as in the removal of an open air safety pin a completly apnoic technique will be necessary. The best choice then would probably be to use inttermittent intravenous doses of succinylcholine with Halothane and Oxygen, maintaining respiration by external chest compression plus intermittent lung expansion via the side arm of the bronchoscope.

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