

## Foreign bodies' inhalation, 39-year-experience Past, present and future

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### Abstract:

Foreign body inhalation is common in pediatric age and since 1897, when Gustav Killian succeeded in removing aspirated Pork bone, from the bronchus. It turned to be a daily practice in Thoracic surgical department to deal with these patients.

Four decades of personal experience in dealing with the inhaled foreign bodies (FB), Ways of presentations. Methods of diagnosis and the successful removal of the FBs using the rigid pediatric bronchoscope will be elucidated. The changing patterns of the types of FB during these years will be emphasized. Majority of these incidents of inhaled FBs are preventable.

The details of findings of all patients, who were subjected to bronchoscopy to remove inhaled foreign bodies, will be presented.

Different kinds and shapes of the inhaled FBs are dealt with during these decades, most of patients were below three years of age, with variable clinical presentation and different radiological appearances. All were managed successfully with minimal complications using the rigid pediatric bronchoscopes.

FBs inhalation is so common in our society and occurs in both lay and professional segments, but commoner in lower socio economic class. Bronchoscopy is the procedure of choice in the removal of this FBs.

**Key words:** Foreign body inhalation, Rigid Bronchoscopes, Stridor, tracheo-Bronchial tree

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### Introduction:

Gustav Killian (The father of bronchoscopy), was appointed professor of ENT at the university of Freiburg in 1892. Gustav Killian in 1897 succeeded in removing aspirated pork bone from the bronchus of a 63-year old farmer under cocaine anesthesia. He used external light source, ahead mirror, Esophagoscope and forceps to remove the bone. He became famous & his clinic attracted patients from far and wide for his expertise in removing different kind of (FBs) such as bones, beans, buttons, coins a tin whistle from children all over his country, even from outside. R1

Blumhagen JD et al stress the risk of foreign body inhalation as an important cause of pediatric morbidity and mortality, particularly in children between the age of 6 months and five years (R2).

An increasing incidence in lower socio economic class may reflect, the ignorance and carelessness as kids should be watched carefully and not left unattended R3.

### Case series:

Since July 1981, I did a very good number of rigid bronchoscopies, under general anesthesia to remove an inhaled foreign body lodged intrabronchially from children, the majority of them were below 3 years of age, inhaled accidentally by them specially, when playing or laughing unnoticed by their parents.

I have published my first paper in 1984, when I was a resident in the thoracic and cardiovascular department, at the medical city teaching hospital at which I have successfully removed 427 foreign bodies during a two-years period, the majority of these foreign bodies (56%), were water melon seed. At that time nearly daily I have to remove one to two water melon seeds, as an emergency daily bronchoscopy R3.

At that time the beginning, I used to remove FB, to start with from farmer's children who were raising the water melon, then the urban children start to appear in addition to different other types such as: Peanut, Sunflower seed, Hazelnut, Chicken and fish bones, worry beads, Almond, Beans, Chick pea, seeds, Broad bean, Pomegranate seed, plastic pieces, pellets, orange seeds, egg shell, metal pieces and screw. We have notice a changing pattern of FB inhalation as after 2003, with the new political system, so most of the girls and women accustomed

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to wear scarfs, fixed by pins which, could accidentally inhaled and impacted into main bronchi. These pins which can be removed by rigid bronchoscopy under GA but the problem was when this foreign bodies impacted distally, so cannot be visualized through bronchoscopy under GA, in few of these patients, we combined the use of rigid bronchoscopy and introducing the flexible bronchoscope through it so better access to a distant area can be achieved, so we succeeded in removing some of these distally impacted pin in few patients, but unfortunately still we failed in few patients, that a limited thoracotomy incisions was used, to remove it successfully.

Most of those children were below three –years. History of the inhalation of the foreign body is very important to ask for, as a positive history is diagnostic of the event of inhalation and bronchoscopy is the procedure of choice to retrieve the F.B. The problem we face that in some children, with no witness for the inhalation and presented with continuous cough and dyspnea for more than two week, and fail to respond to a proper medical treatment, Bronchoscopy is indicated as in 2/3 of these children turned to have FB in their bronchi, with the complete cessation of all respiratory symptoms after bronchoscopic removal of the inhaled FB. Figure .Different types and shapes of FBs are shown in Figure (1) and Figure (2)

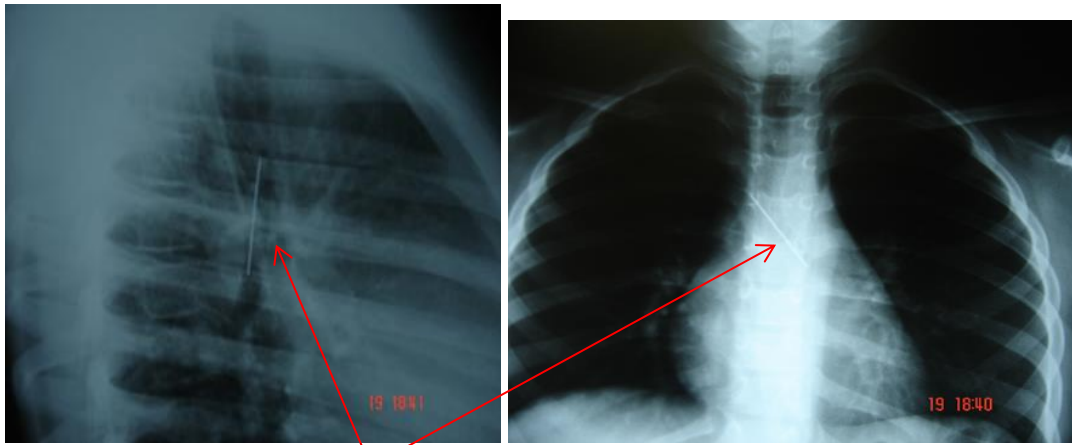


**Figure (1) Different kinds of inhaled FB removed successfully by Bronchoscopy under GA.**



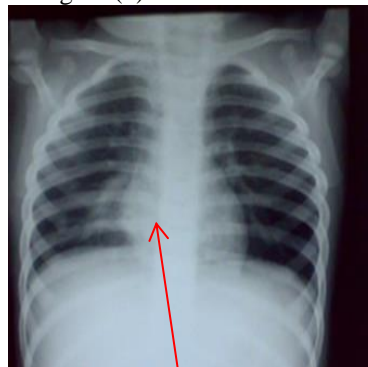
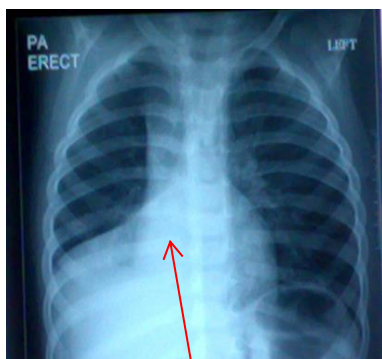
**Figure (2) Inhaled FB removed successfully by Bronchoscopy under GA.**

Chest X-ray is useful especially in a radio opaque FB, which will cast a shadow on the X ray, Unfortunately some of our colleagues, immediately request CT scan to check for FB, this should be so limited to avoid hazards of radiation to the child. Radio opaque FB (Pin) seen on Chest X-ray, Figure (3)



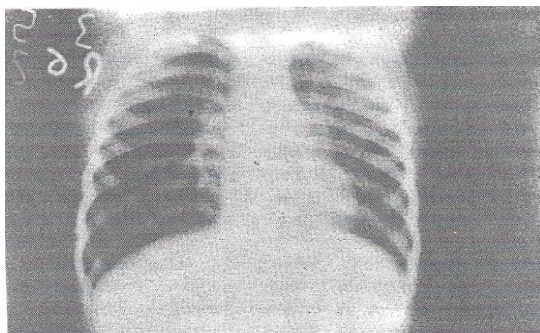
**Figure (3) Foreign body (Pin) impacted in the left main bronchus, removed bronchoscopically under general anesthesia.**

CXR may be completely normal especially in early period of inhalation, other X-ray findings; we may have atelectasis or collapse of segment, lobe as shown in figure (4)



**Figure (4) a: Total collapsed right lower lobe B- Totally expanded right lung post bronchoscopy by FB. (Sunflower seed)**

CXR can show emphysema on one side due, to the act of the FB as a check valve, permitting the air to enter during inspiration and stay there during expiration (Obstructive emphysema) as shown in figure (5)



**Figure (5) Obstructive emphysema right lung (R3)**

Some of these children presented acutely with severe sudden dyspnea, and distress, and they should be admitted in an emergency setting to avoid cyanosis and child collapse due to asphyxia, this retrieved FB, turned to be glottic or sub glottic in location. In few cases tracheostomy was needed to relief post bronchoscopy laryngeal edema, caused by the extensive inflammatory changes resulted from impacted FB and prolonged procedure.

The most important step in the diagnosis is the history, so careful interrogation of the family, or the witness is mandatory.

The usual presentation of these children is cough and dyspnea, however, these symptoms and signs depend on the type of the FB, its size, shape and site of impaction and this is in agree with other study D Passali et al (4)

Chest X-ray was done to all children and it can gives some clue to the presence of FB and this in a agree with Arvind Sehgal et al (5)

Adequate preparation of the child and the instruments in use are important, so that the procedure will be safe and successful. The procedure of bronchoscopic removal of the FB is conducted under GA, during which the pulse rate, O<sub>2</sub> saturation, rhythm and child color are monitored, until spontaneous breathing and consciousness regained (R3)

Rigid bronchoscopy is the procedure of choice to remove the inhaled FBs and this in agree with others studies R (2-4)

After the procedure, most of these children were monitored, may needs temporary O<sub>2</sub>, and may be with single dose of antibiotics. Steroid usually given to children with laryngeal edema.

The use of flexible bronchoscopy to remove the aspirated FBs by SafyKadda (R6) is not recommended in our setting as we believe that rigid Bronchoscopy under GA with the child fully relaxed and a properly selected grasping forceps and a better function suctioning system attached to the rigid bronchoscope offer an excellent environment for retrieval of the FB.

#### **Conclusions and recommendations:**

- Nearly all the cases could be considered preventable and the followings are recommended
- Foreign bodies should not be within the reach of children, and kids should be watched carefully, mothers should pay more care and attention during meals, however, if such an accident happens, parents should avoid manual extraction of the foreign body as this may end in asphyxia and death .
- As regard these young girls wearing scarfs, they should avoid the bad habit of putting the pins between their lips prior to fixation of their scarf.
- Any suspicion or history of FBs inhalation is a justification for bronchoscopy, a negative bronchoscopy, better than to miss something inside, with the bad squeal of obstruction, infection, and destroyed segment or lobe which may needs future unnecessary thoracotomy and lobectomy.

#### **Reference**

- 1- Zöllner F. *Gustav Killian, father of bronchoscopy, Arch Otolaryngol, 1965, Dec.: Vol 82 No. (6): P 656-9*
- 2-Blumhagen JD, Wesenberg RL, Brooks JG, Cotton EK. *Endotracheal foreign bodies: Difficulties in diagnosis. Clin Pediatr 1980; 19: 480-484.*
- 3-Waleed.M.hussein, *Tracheobronchial foreign bodies in pediatric age group .J. Fac. Med.Baghdad 1984 , Vol (26).No. (4) .P (63-71)*
- 4-D Passàli, M Lauriello, L Bellussi, GC Passali, FM Passali, and D Gregori , *Foreign body inhalation in children: an update , Acta Otorhinolaryngol Ital. 2010 Feb; 30(1): 27–32.*
- 5-Arvind Sehgal, Varinder Singh, Jagdish Chandra and N.N. Mathur, *Foreign body Aspiration .Indian Pediatrics 2002; 39: 1006-1010*
- 6-Safy Kaddah ,Sabah Ahmed:*Management of airway foreign body using flexible bronchoscopy: Egyptian Journal of Chest Diseases and Tuberculosis, Volume 64, Issue1, January 2015, Pages 261-267*