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Foreign
Body
Aspiration

Epidemiology

- 90% of children who aspirate foreign bodies (FBs) are younger than 3 years and two thirds are boys.
- Food and toys account for approximately 90% of FB aspiration in children.
- Nuts, and most especially peanuts, are the most common inhaled objects.

PATIENT ASSESSMENT

- FB location may be supraglottic,glottic,subglottic, tracheal and bronchial.
- The manifestations of aspiration depend on the size of the FB, its composition, its location, the degree of blockage, and the duration of obstruction.
- The characteristic history of a choking or gagging episode, followed by a coughing spell, should be carefully considered.

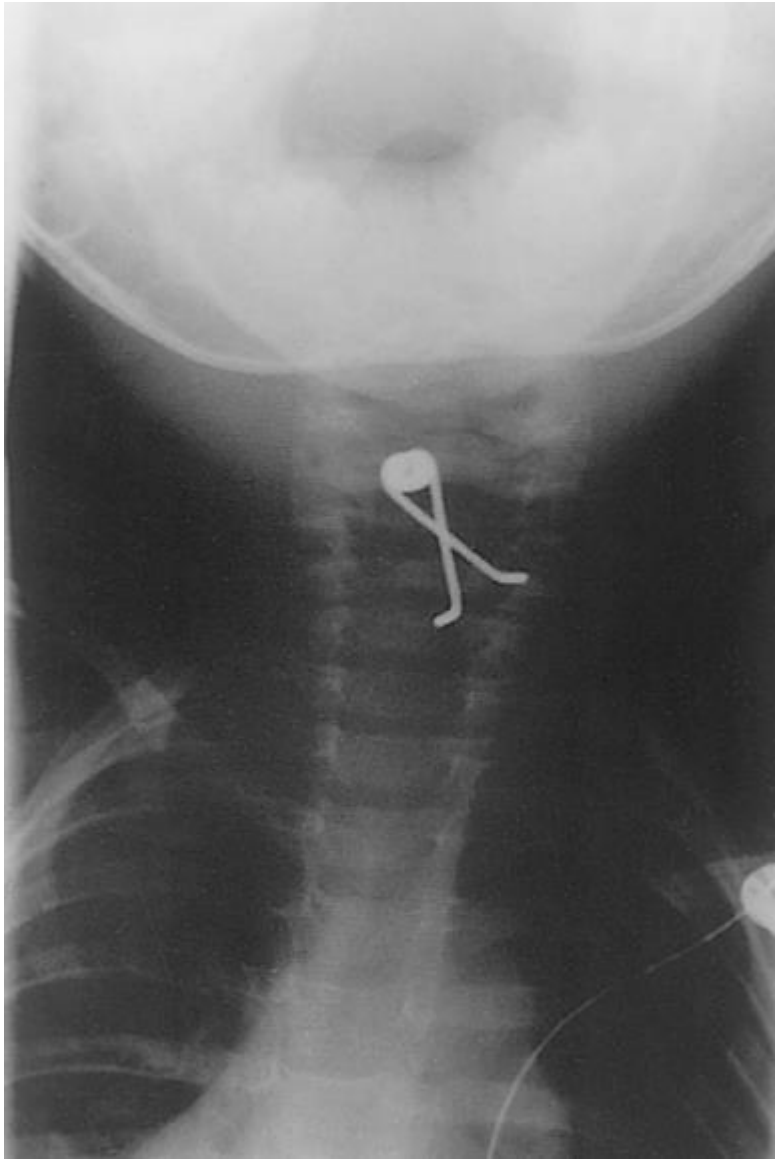
GAGGING vs CHOKING

- ✔ Airway is clear
- ✔ Making noise like crying, coughing, or retching
- ✔ Face may turn red from straining
- ✔ May have watery eyes (tears are normal!)
- ✔ Can lead to vomiting

- ✖ Airway is blocked or partially blocked
- ✖ Silent or high pitched wheezing sound
- ✖ Face may turn blue due to lack of oxygen
- ✖ Baby is more still - not as dramatic as gagging
- ✖ Requires immediate

- Most inhaled FBs travel distally into the tracheobronchial tree, but laryngeal impaction occasionally occurs with the highest rate of mortality (45%) .

- Large objects such as hot dogs are apt to obstruct the glottic inlet and precipitate acute respiratory arrest.



- Following the aspiration ,symptoms and signs as cough, stridor, hoarseness, wheezing, and fever mimic the more common diseases of the respiratory tract, including asthma, bronchiolitis, laryngitis, pharyngitis, and croup.

- Subglottic FBs present unique clinical challenges. The majority of FBs in this location are delayed in diagnosis and may likely present as protracted episodes of stridor, croup, or hoarseness.

- Symptoms may occur within hours of the aspiration or weeks later.
- Only two thirds of patients seek treatment within 1 week following aspiration.
- Following the initial episode of paroxysmal coughing, an asymptomatic lag period occurs. This situation may falsely reassure the parent and the physician that the child has cleared the airway
- The absence of obvious symptoms after a witnessed choking episode does not exclude the presence of a retained FB.

When to suspect foreign body aspiration?

- Witnessed FBA, regardless of symptoms.
- History of choking with or without symptoms.
- Sudden onset of respiratory symptoms.
- The classic triad of wheeze, cough, and diminished breath sounds (50%).
- Unilateral abnormality on auscultation or CXR.
- Unilateral recurrent or persistent pneumonia.
- Prolonged croup like signs and symptoms.
- poor controlled or atypical asthma.
- chronic cough.

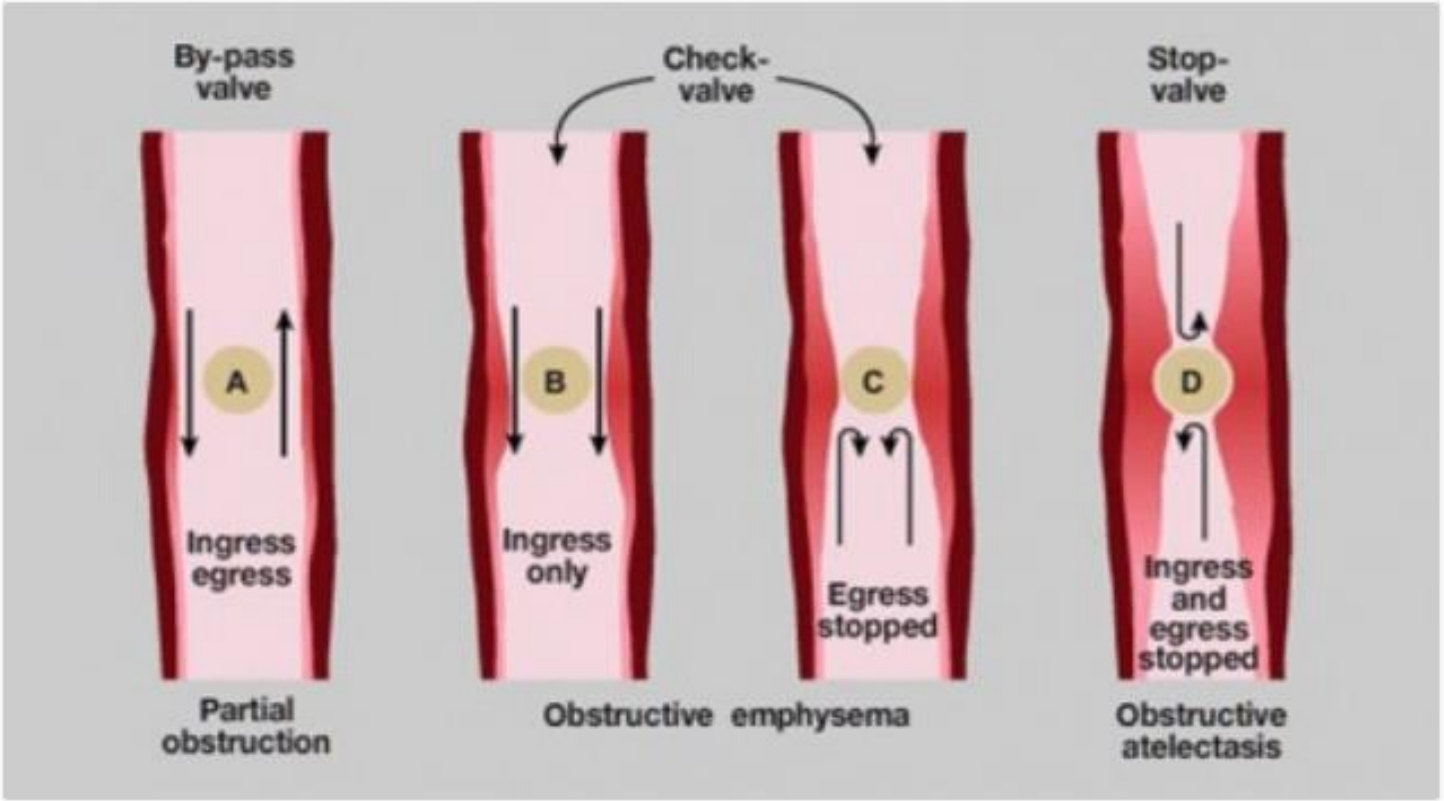
PHYSICAL EXAMINATION

- Classic physical findings in case of FB aspiration consist of unilateral decreased breath sounds as a result of decreased aeration of the lung and unilateral rhonchi due to partial occlusion of the bronchus.
- The clinical triad of wheezing, coughing, and diminished or absent breath sounds is present in only about 50% of patients, although 75% have one or more of these findings.

- Rapid changes in respiratory status may occur due to development of edema or change in location of the FB.

- Tracheal FBs are particularly treacherous in this regard, with patients alternating between periods of normality and severe obstruction due to a ball-valving effect.

3 Phases of Bronchial Foreign Body Obstruction

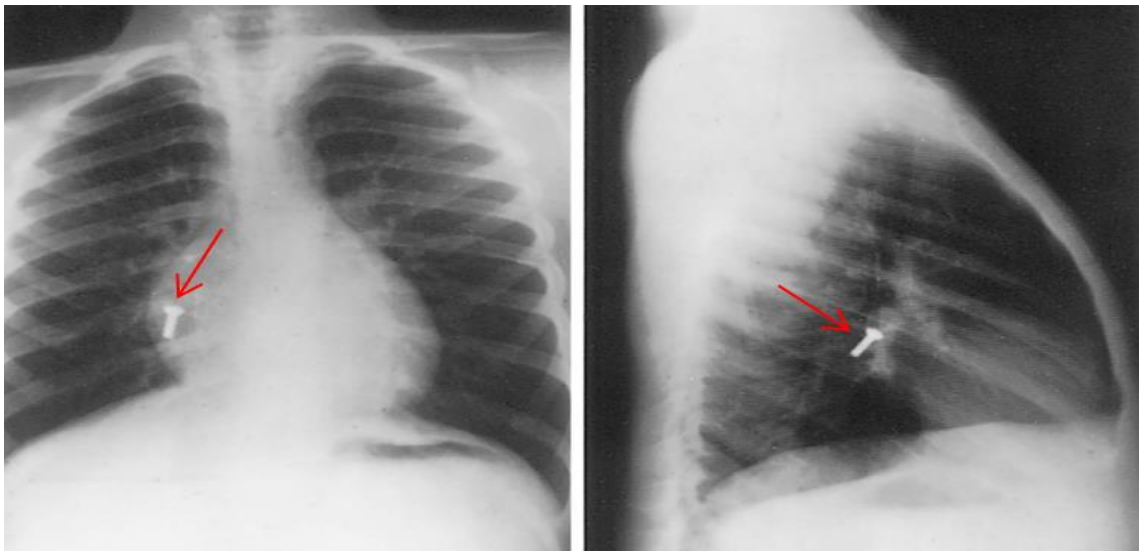


- FBs in the larynx or upper cervical trachea produce aphonia or hoarseness with inspiratory or biphasic stridor.

In many cases, the signs are subtle, and it is important to appreciate that the physical examination may be normal.

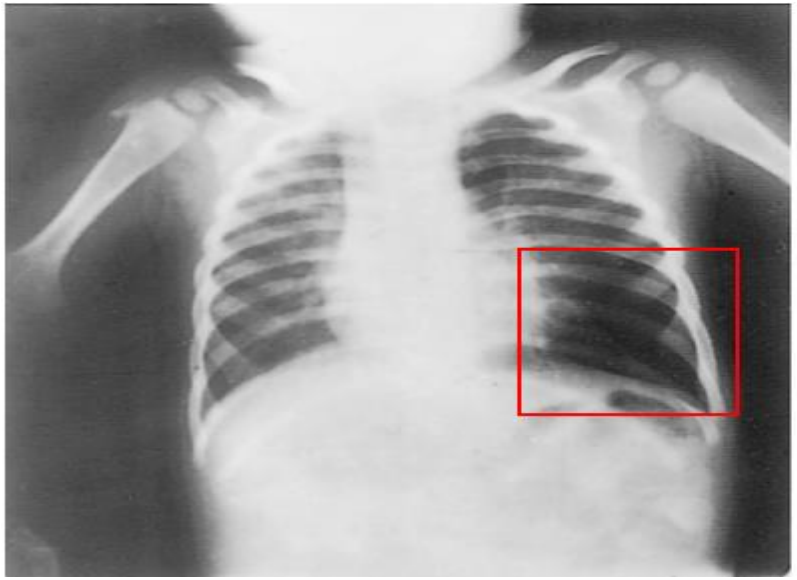
RADIOGRAPHY

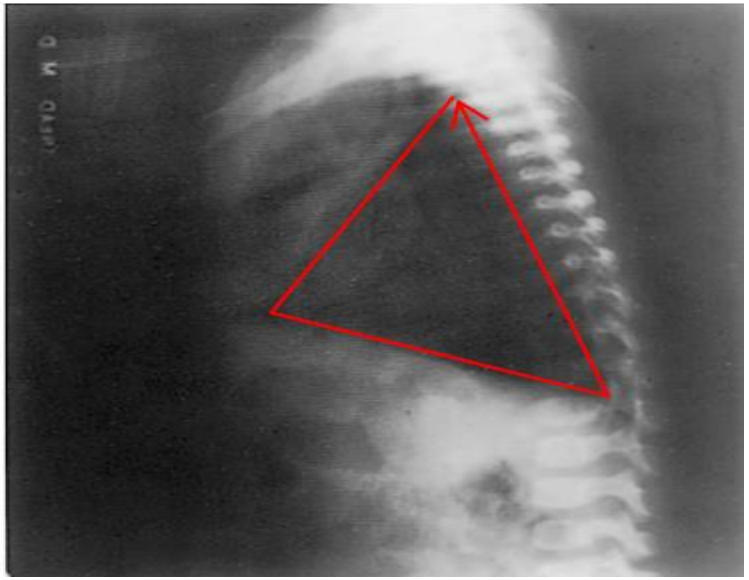
- After history taking and physical examination, plain neck and chest radiographs should be obtained.
- About 10% of aspirated FBs are radiopaque ,in majority of FBs changes seen are secondary to the obstruction of the airway by the object.



- The classic radiographic abnormality is unilateral hyperlucency on an expiratory film due to a ball-valve effect.

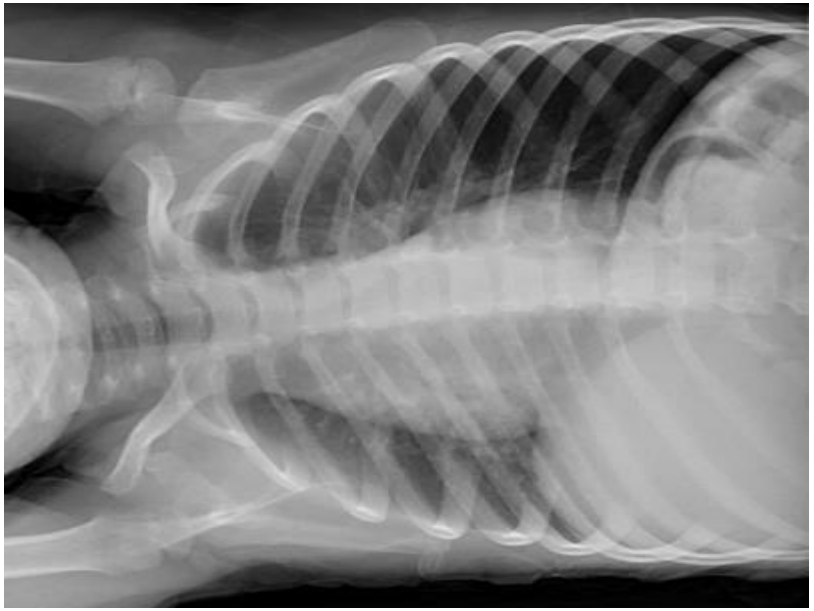
- Other studies that may demonstrate unilateral air trapping are decubitus views of the chest or chest fluoroscopy.

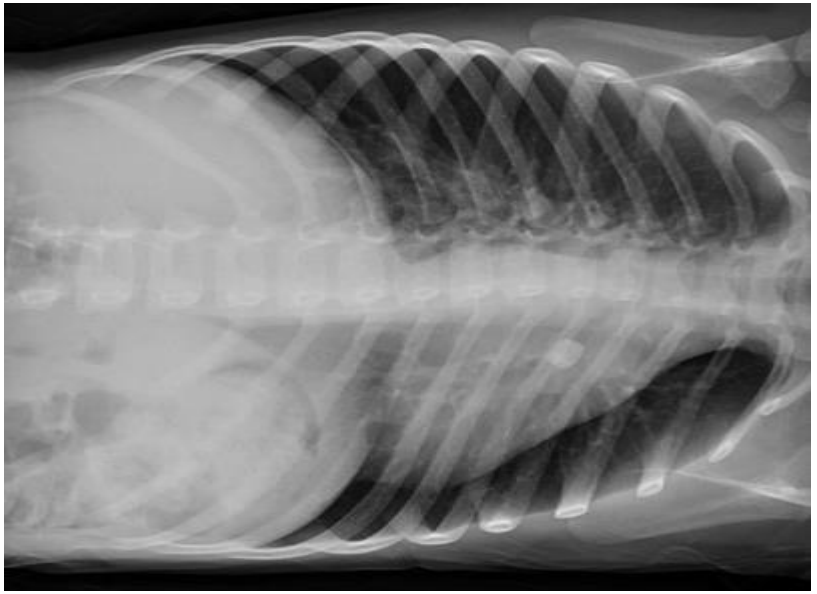




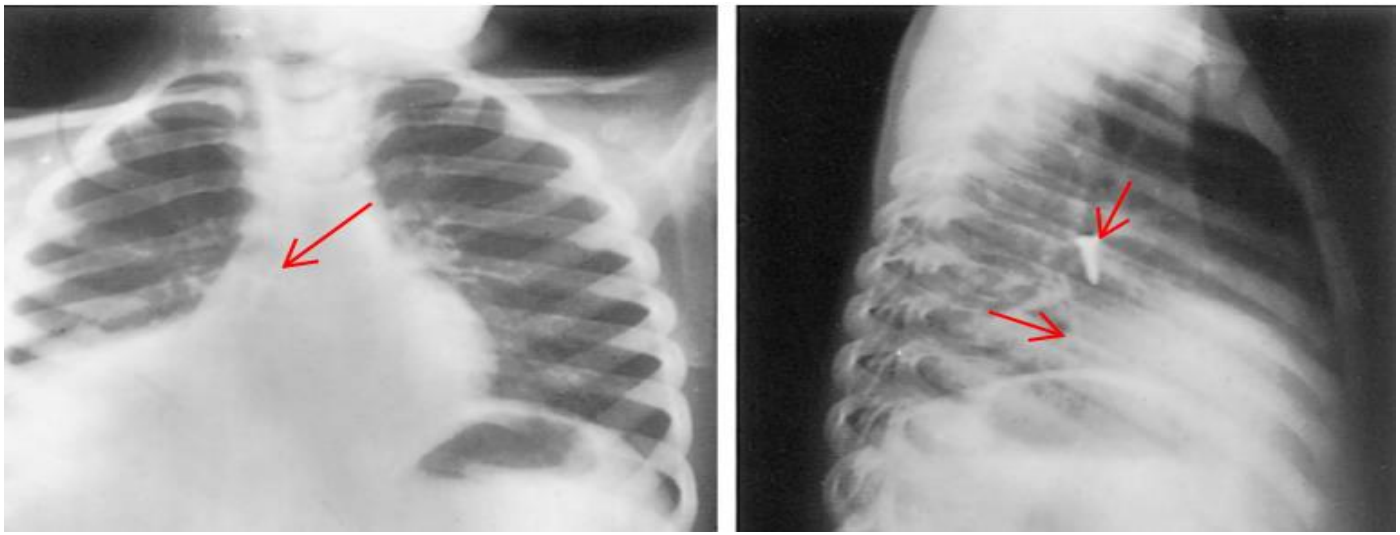
Inspiratory and expiratory views

Bilateral decubitus in foreign body aspiration



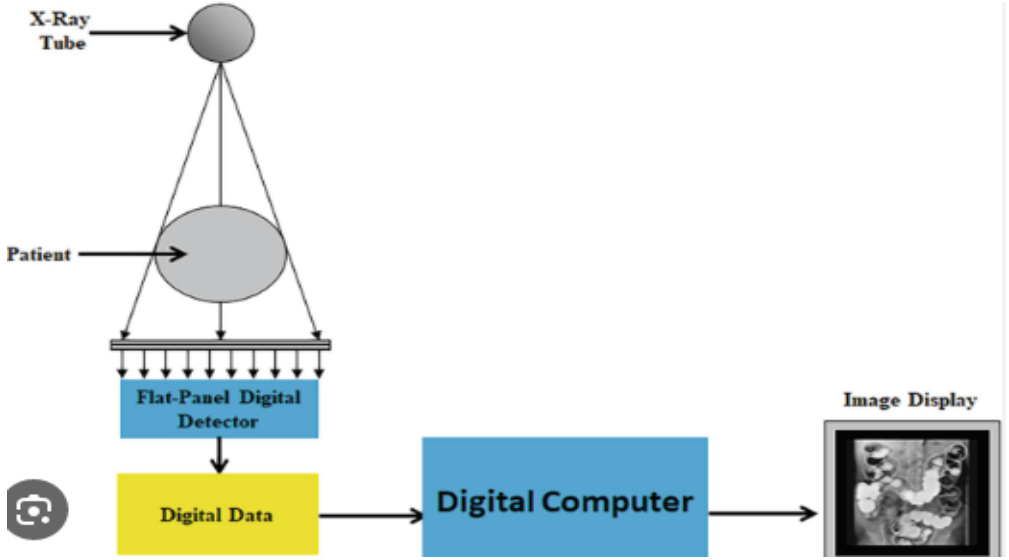


- Indirect radiologic signs include resorption atelectasis, compensatory emphysema of the contralateral lung, pneumonia, pneumothorax, and expiratory shift of the mediastinum.
- Late findings : pulmonary abscess ,bronchiectasis , lobar or segmental pulmonary infiltrate from impaired clearance.



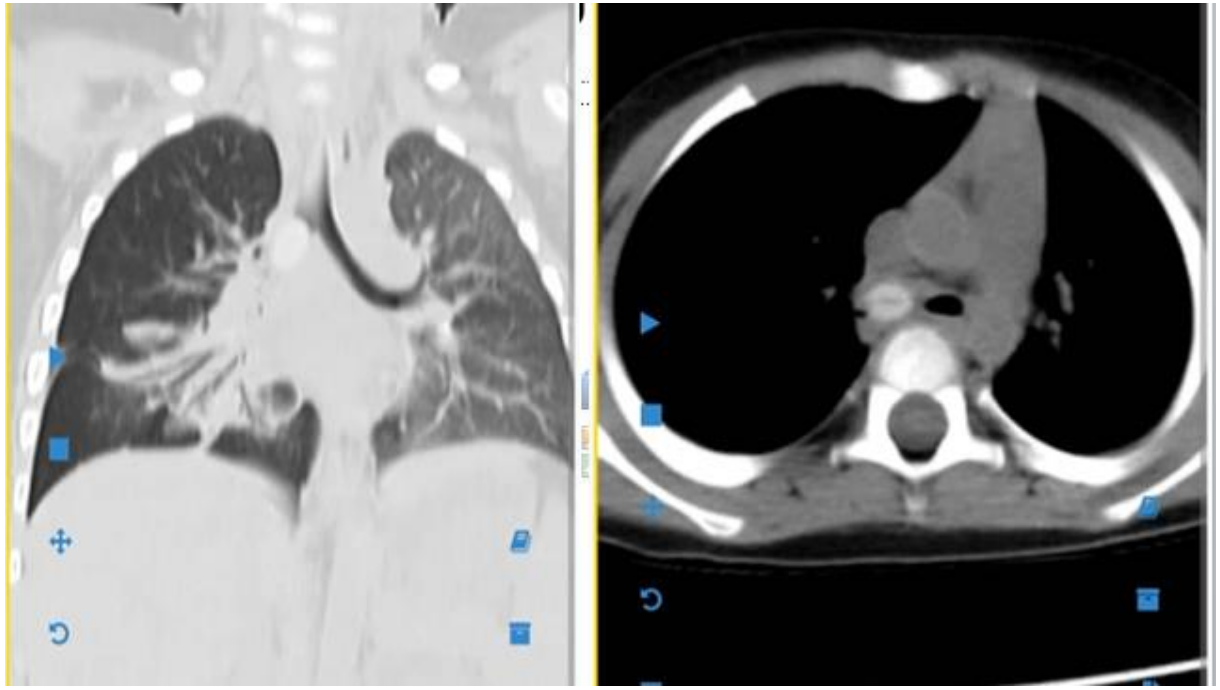
Fluoroscopy

- Fluoroscopy may be used to identify and localize a radiolucent foreign body(50%).
- Abnormal mediastinal shift with decreased excursion of the diaphragm, representing air trapping.



Low-dose CT protocol

- CT has a sensitivity of almost 100 percent and specificity of 66 to 100 Percent.
- CT can indicate the exact location of the FB and detect associated complications.



- Up to 25% of bronchial FBs, and over of 50% those in the trachea, yield no abnormalities on plain chest radiographs.

FB aspiration can never be excluded on the basis of a normal CXR alone.

MANAGEMENT

- In the rare instance in which the child is blue and apneic, the adult should quickly look into the back of the child's throat and remove any visible object that is identified.
-  Blind finger sweeps in the pharynx are discouraged, because the FB may easily be pushed further into the airway.

- Specific recommendations for the acute management of the choking child depends on his or her age.

- The Heimlich maneuver is the preferred technique for pediatric FB airway obstruction in toddlers and older children, but a combination of chest thrusts and back blows is preferred for infants.

- Direct laryngoscopy and bronchoscopy in the pediatric population are most safely accomplished under general anesthesia with spontaneous ventilation.

- If respiratory distress is not severe, it is appropriate to allow time for gastric emptying, which decreases the anesthetic risk.

-  There is no place for chest physiotherapy and bronchodilators.
  This carries a significant risk for cardiopulmonary arrest associated with FB migration during therapy.

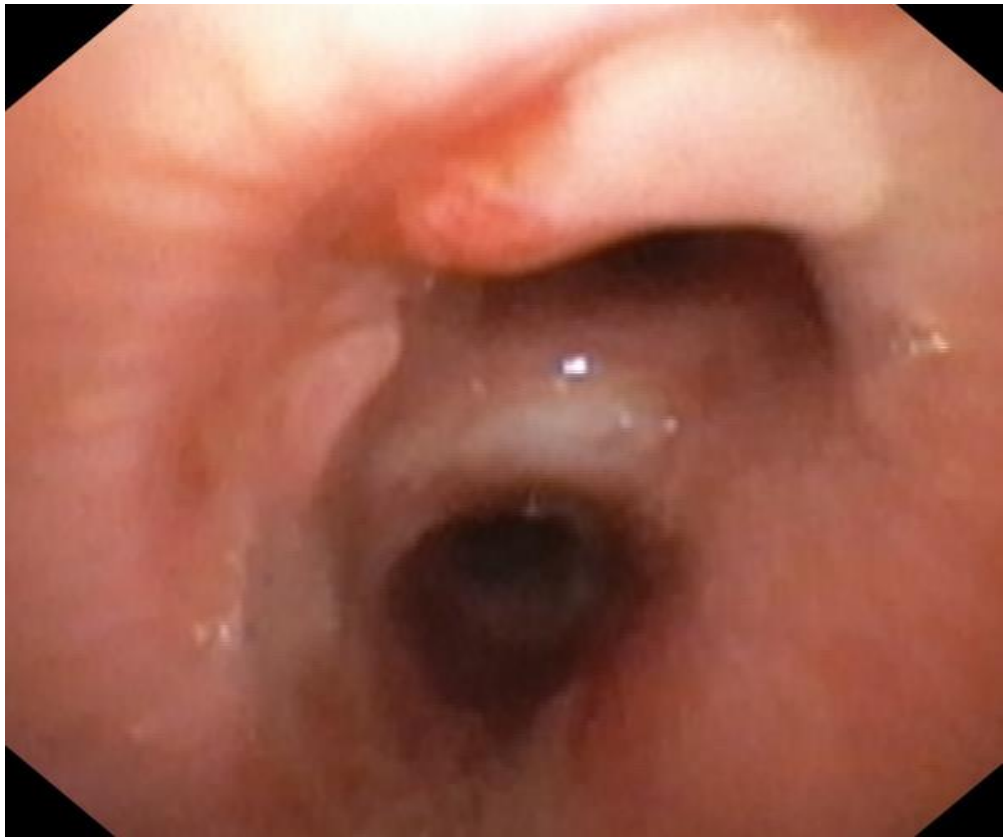
- Perioperative steroids may help to decrease any edema associated with bronchoscopic manipulation.

- Rigid bronchoscopy remains the standard of care for management of tracheobronchial FBs in children.

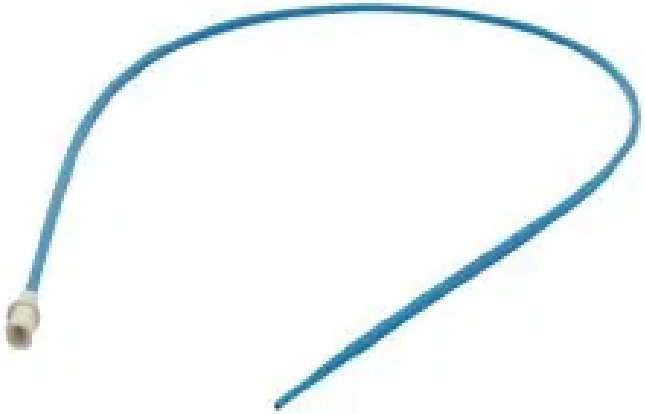
- The use of flexible bronchoscopy to be restricted largely to diagnosis rather than extraction.

- After FB removal, repeat bronchoscopy should be performed, looking for multiple objects or fragments of the original object.

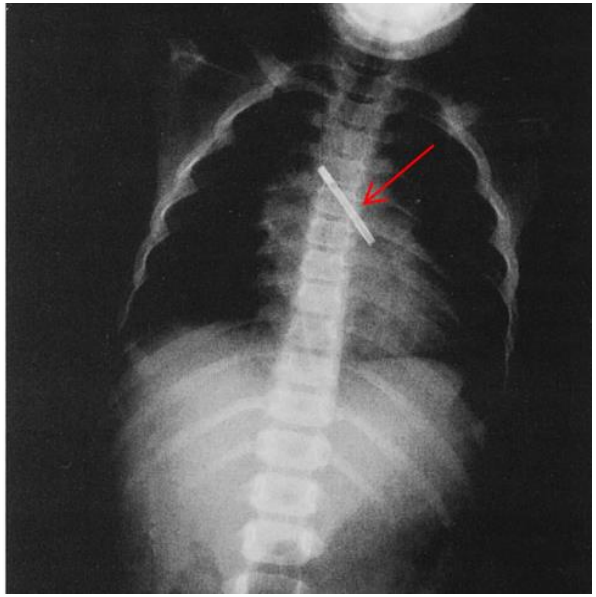
- Granulation tissue should be left untouched, since it will resolve quickly after FB removal.



- The Fogarty catheter has been employed to remove an impacted FB. This tool must be used with much caution, because the balloon tip may break and become a second FB.



- In rare cases when there is major impaction or severe chronic inflammatory changes secondary to delay in diagnosis, endoscopic removal may be impossible and thoracostomy is indicated.



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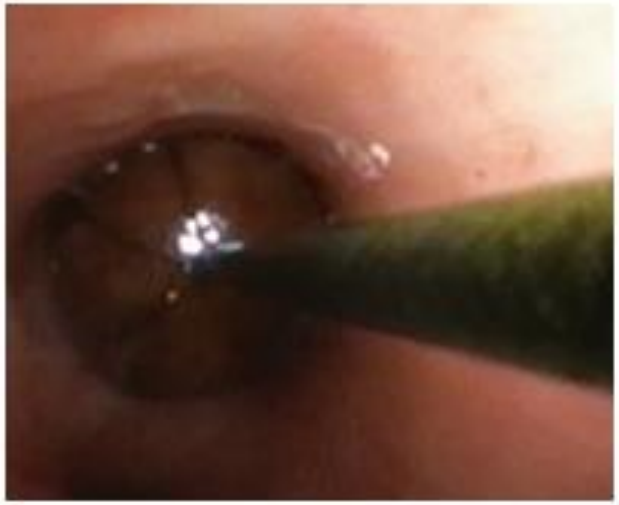
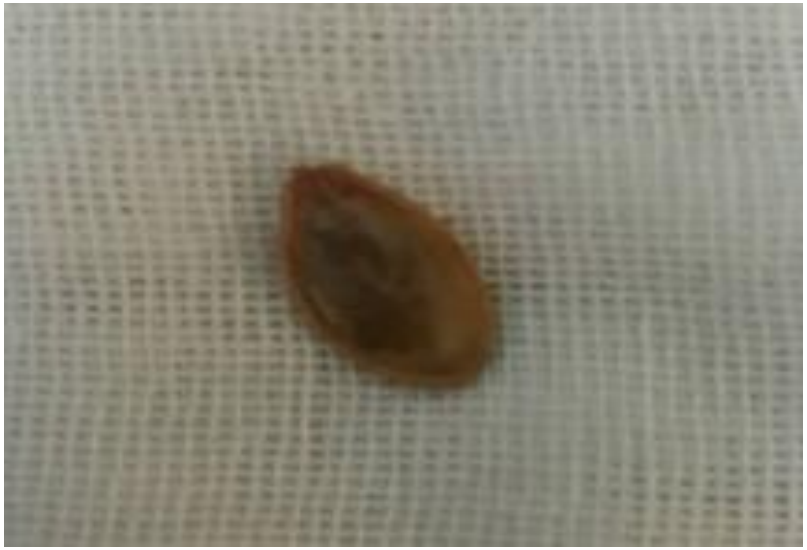
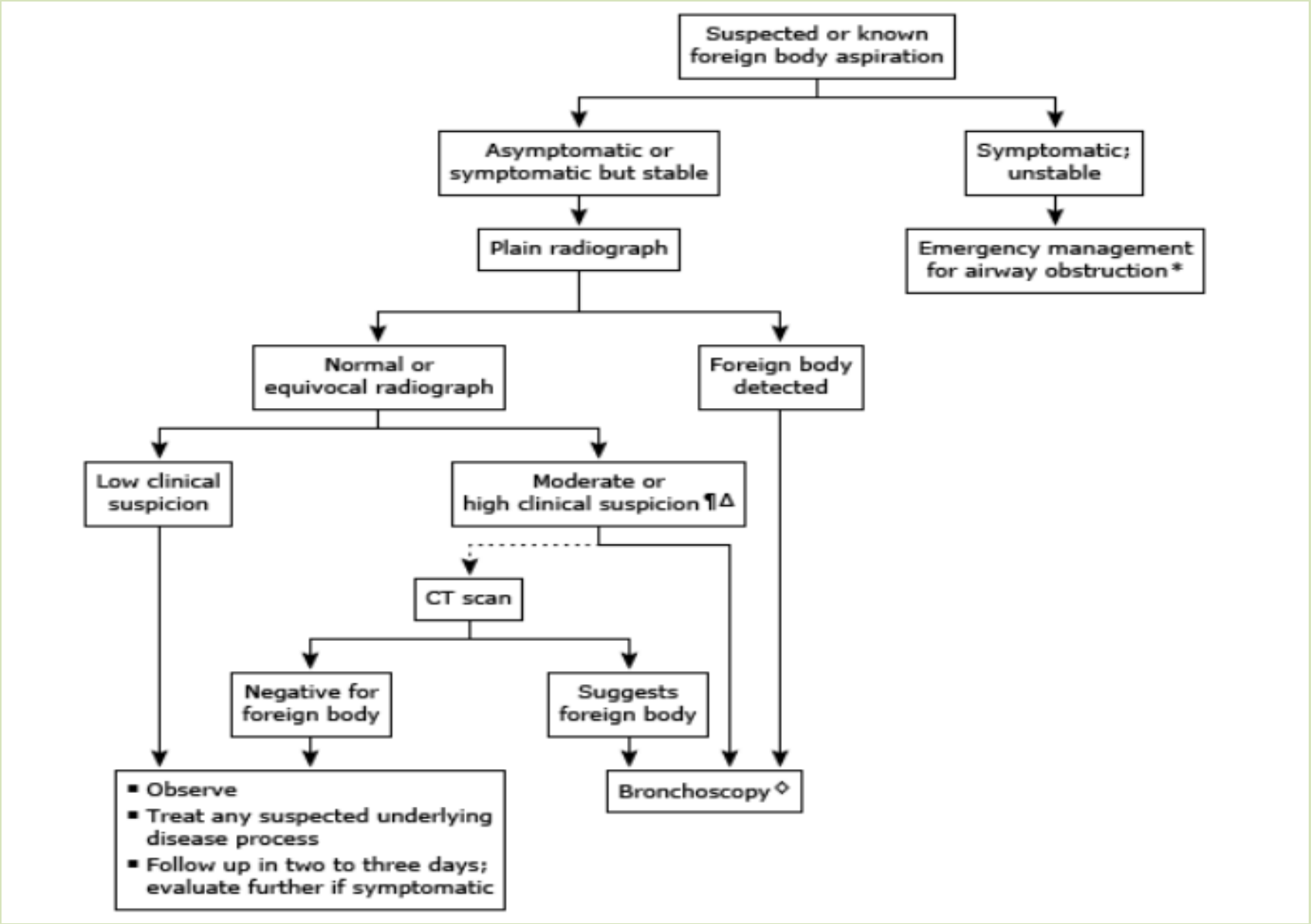
FLEXIBLE BRONCHOSCOPY FOREIGN BODY EXTRACTION

RIGID BRONCHOSCOPY FOR FOREIGN BODY REMOVAL



Samples of removed objects




Suspected or known foreign body aspiration
Asymptomatic or symptomatic but stable
Symptomatic; unstable
Plain radiograph
Emergency management for airway obstruction*
Normal or equivocal radiograph
Foreign body detected
Low clinical suspicion
Moderate or high clinical suspicion ¶Δ
CT scan
Negative for foreign body
Suggests foreign body
Observe
Treat any suspected underlying disease process
Follow up in two to three days; evaluate further if symptomatic
Bronchoscopy◇


thank
you