Case 018: Sudden respiratory distress while eating peanuts

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A 24-month-old previously healthy boy presented with increasing cough and mild fever 15 hours after choking and transiently turning cyanotic while eating peanuts. On examination, the boy was not cyanotic and blood pressure and pulse rate were normal. Respiratory rate was 30 breaths/min. Chest examination revealed hyper-resonance to percussion and decreased air entry on auscultation over the left chest.

1. What is the differential diagnosis?

The differential diagnoses include food allergy (main culprits include peanut, egg, and milk at that age), tension pneumothorax, tumor, respiratory infection (pneumonia, croup, epiglottitis), and asthma. However, with a unilateral presentation and a history of choking and turning cyanotic while eating peanuts, as in this case, there is little doubt that this is a case of foreign body aspiration and airway obstruction.

A chest x-ray was ordered and the image appears below:
2. Describe the findings on this x-ray.

The chest x-ray shows hyperinflation of the left chest with deviation of the trachea and displacement of the mediastinum to the right.

3. Explain the pathophysiology of hyperinflation following obstruction of a main stem bronchus by foreign body.

Hyperinflation is the result of air trapping on the side of obstruction and brings on a sequence of events potentially ending in cardiovascular collapse:

- During inspiration, the chest expands, as do the main airway passages, and air fills both lungs.
- During expiration, the chest contracts, as do the main airway passages. On the side of the obstruction, the airway contracts around the foreign body, making it more difficult for that lung to empty. That is, it is easier for air to fill the lung on the obstructed side in inspiration than for that lung to empty during expiration. With every breath, a bit of air is trapped because of this ball-valve effect.
- As time goes on, intra-thoracic pressure on the obstructed side builds up and pushes the mediastinum to the opposite side. This displacement of the mediastinum distributes the increase in intra-thoracic pressure on the obstructed side to the non-obstructed side and pressure in both hemi-thoraces increases.
- Increase in intra-thoracic pressure together with displacement of the mediastinum interferes with venous return and causes a fall in cardiac output, ultimately leading to cardiovascular collapse.

4. What is the proper management of this child?

Besides giving the child oxygen supplement, immediate retrieval of the foreign body via a rigid bronchoscope under general anaesthesia should be arranged. Any delay in treatment would mean increasing compromise of both the respiratory and circulatory functions of the patient.

Progress: The child was on the operating room table under general anesthesia within half an hour after the diagnosis was made. Rigid bronchoscopy revealed total occlusion of the left main stem bronchus by a peanut (see picture). The peanut was friable and had to be removed as multiple small fragments.
Further Readings


Ho AMH. Food anaphylaxis – An important cause of acute respiratory distress in infants. Anesthesia & Analgesia 1993;77:1289.