

Pneumothorax

CoreNotes by Core Concepts Anesthesia Review, LLC

What You Must Know

1. Pneumothorax is an abnormal collection of air in the pleural space, which causes a separation of the visceral pleura from the parietal pleura and partial to complete collapse of the lung.
2. Pneumothorax can result from trauma, infection, lung disease, connective tissue disease or can occur spontaneously.
3. Iatrogenic pneumothorax has been associated with central venous catheterization, endotracheal intubation, mediastinoscopy, laparoscopy & bronchoscopy.
4. Signs and symptoms of pneumothorax vary from mild shortness of breath to severe hypoxemia, chest pain and tachycardia.
5. Tension pneumothorax occurs when the pressure of air in the pleural space exceeds ambient pressure. This is the result of a check-valve-like effect, allowing air to enter the pleural space on inspiration, but preventing it from exiting during expiration.
6. Tension pneumothorax results in the impairment of venous return, mediastinal shift and severe hemodynamic & ventilatory compromise.
7. Pneumothorax can be worsened or converted to tension pneumothorax with the initiation of positive-pressure ventilation.

The lungs remain inflated in the thorax as a result of negative pressure in the pleural space, as compared to the airways. Air fails enter the pleural space since there are normally no connections of the pleural space to the lungs or airways. Pneumothorax develops if air gains access to the pleural space, through damage to the chest wall or to the lung itself. Depending on the quantity of air that has entered the pleural space, the degree of lung collapse may be very minor to complete.

Signs and symptoms of pneumothorax include chest pain, dyspnea, diminished breath sounds, hyperresonance, tachycardia and hypoxemia. Tension pneumothorax can result in a significant increase in intrathoracic pressure, thereby impeding venous return and decreasing cardiac output.

Radiographic features include separation of the visceral pleura from the chest wall and the absence of pulmonary vasculature peripheral to the pleural line. Pneumothorax is typically seen best during exhalation. Tension pneumothorax is associated with a mediastinal shift away from the side of the pneumothorax.

Although small pneumothoraces may resolve spontaneously, definitive treatment of requires placement of a chest tube. Tension pneumothorax is considered a surgical emergency requiring immediate chest tube placement to restore cardiopulmonary stability. Emergent decompression of a tension pneumothorax can be accomplished by placing a 14 – 16 gauge IV catheter into the 2nd rib space at the mid-clavicular line.

Additional Reading:

Longnecker, DE, Brown, DL, Newman MF and Zapol, WM. *Anesthesiology*. New York: McGraw Hill, 2012: 979-980