

Pulmonary Air Leak in a Newborn

Pulmonary Air Leak

- a. Pulmonary air leak occurs more frequently in the newborn period than at any other time of life.
- b. Air escapes the lungs into extra-alveolar spaces-resulting disorder depends on the location of air.
- c. Most common conditions.
- d. Pneumothorax, pneumomediastinum, and pneumopericardium.
- e. Rarer conditions.
- f. Subcutaneous emphysema and pneumoperitoneum.

Risk Factors

- a. Most cases of air leaks occur in newborns with underlying lung disease.
- b. Preterm infants are at increased risk because they frequently have Respiratory Distress Syndrome (RDS).

Pneumothorax

- I. Air in the space between the parietal and visceral pleura.
- II. Usually show signs of respiratory distress such as tachypnea, grunting, pallor, and cyanosis.
- III. Findings on Physical exam.
- IV. Chest Asymmetry.
- V. Decreased breath sounds on affected side.
- VI. Shift of the PMI away from the affected side.

Diagnosis of a Pneumothorax

- a. Should be suspected in any newborn with the sudden onset of respiratory distress.
- b. Transillumination of the chest may help make the diagnosis:
- c. A pneumothorax lights up the affected hemithorax.
- d. AP Chest radiograph:
- e. Air in the pleural space.
- f. Flattening of the diaphragm on the affected side.
- g. Shift of the mediastinum away from the pneumothorax (Figure 1).

Management of a Pneumothorax

- I. Infants without a continuous air leak or respiratory distress can be closely monitored.
- II. Oxygen supplementation.

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- III. Thoracentesis for emergent treatment of a symptomatic pneumothorax.
- IV. Chest tube placement for definitive drainage.

Congenital Lobar Emphysema

- A. Developmental anomaly of the lower respiratory tract that is characterized by hyperinflation of one or more of the pulmonary lobes.
- B. Rare with a prevalence of 1 in 20,000 to 1 in 30,000.
- C. Males affected more than females in a 3:1 ratio.
- D. 50% of cases occur in the first 4 weeks after birth.
- E. 75% of cases are found in infants < 6 months of age.

Congenital Lobar Emphysema

Characterized by:

- A. Difficulty in breathing or very rapid respiration in infancy.
- B. Enlarged chest due to over inflation of at least one lobe of the lung.
- C. Compressed normal lung tissue in the section of the lung closest to the diseased lobe.
- D. Bluish color of the skin (cyanosis.)
- E. Underdevelopment of the cartilage that supports the bronchial tube (bronchial hypoplasia).

Diagnosis of Congenital Lobar Emphysema

- a) Chest X-Ray, CT, MRI can determine which part of the lung, which lobe is affected, and to what degree.
- b) Lung function tests are also helpful studies to determine which part of the lung are affected and if surgery is necessary (Figure 2).



Figure 1: Neonate with Right Tension Pneumothorax.

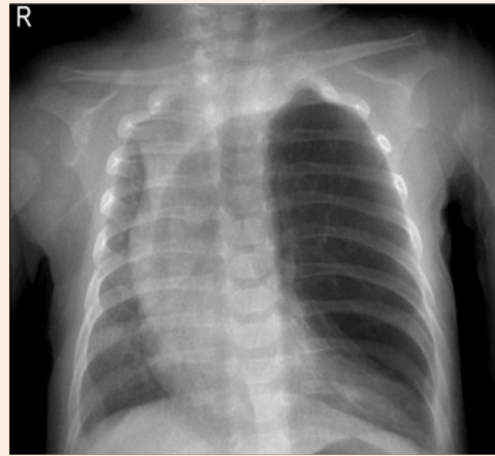


Figure 2: Neonate with Congenital Lobar Emphysema.

Management of Congenital Lobar Emphysema

- a. Depends on the extent of the damage to the lungs at the time of diagnosis.
- b. If lung damage is limited, disease may not cause any adverse affects-closely monitor.
- c. If condition affects the patient's ability to breath-Surgical removal (resection) of the affected lobe of the lung or the whole lung on the affected side.

References

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