Respiratory Distress in Newborns

Fifth year lecture

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Objectives

- Define the normal breathing pattern
- Define respiratory distress
- List RD signs & symptoms
- Identify Causes of RD in a neonate
- Differentiate the different causes of RD
- Recall the basic concepts of management and explain the benefit of each

> 90 % of cardiac arrest in neonates are caused by respiratory illnesses

Normal breathing pattern

- RR=40-60bpm
- Periodic breathing
- Absence of RD signs

RD definition

Any deviation from the normal breathing pattern or efficacy , might reflect intrinsic respiratory problem or indirectly indicates disturbance in other systems

Symptoms & signs

1. Tachypnea:

- Respiratory rate > 60 bpm

- Newborns minimize work of breathing by adjusting respiratory rate

- Total work of breathing consist of resistant and resistive components
  - Rapid and shallow
  - Slower and deep

Symptoms & signs

2-Retractions:

- Neonatal chest wall is extremely compliant
- The more retraction the stiffer lungs
- When retraction improves ,lung compliant is improving

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3-Nasal Flaring :

- Enlargement of nostril produced by contraction of the alae nasi muscles
- Decrease nasal resistance

Symptoms & signs

4-Grunting :

- Sound produced by expiration through partially closed epiglottis
- Equals to pressure of 2-3 cmH2O applied by continuous destinding pressure
- Maintain FRC , improve V /Q

Symptoms & signs

6-Cyanosis

Peripheral cyanosis may be normal in the newborns (Acrocyanosis)

Extra Pulmonary

Mechanical –restrictive problems
Airway obstruction Rib cage abnormalities Thorasic dystrophies Generalized bone disease Diaphragmatic disorders Phrenic nerve injury , congenital evantration of the diaphragm Pleural effusion or chylothorax Abdominal distension
Hematologic disorder
Anemia Polycythemia **Acid –base disturbance** Metabolic acidosis

Extra Pulmonary

Neuromuscular disorders
Brain : asphyxia , drugs , haemorrhage , infection Spinal cord: trauma,SMA Nerves: phrenic nerve injury Myasthenia graves Muscular dystrophy
Cardiovascular disorders :
CHD Heart failure and pulmonary edema PPHN **Infection**

Pulmonary Causes

- Respiratory distress syndrome
- Meconium aspiration
- Transient tachypnea of the newborn
- Air leaks
- Neonatal pneumonia
- Pulmonary hemorrhage
- pulmonary hypoplasia
- congenital bronchopulmonary malformation

Respiratory Distress Syndrome

- Etiology
- Diagnosis
  - Clinical : combination of clinical and radiographic manifestations
  - Definite : autopsy or surfactant measurement

Epidemiology

- Through out the world
- Slight male predominance
- Risk factors :
- GA
- BW
- Maternal diabetes
- Asphyxia

Birth Weight & RDS

501-750	**71%**
751-1000	54%
1001-1250	36%
1251-1500	22%

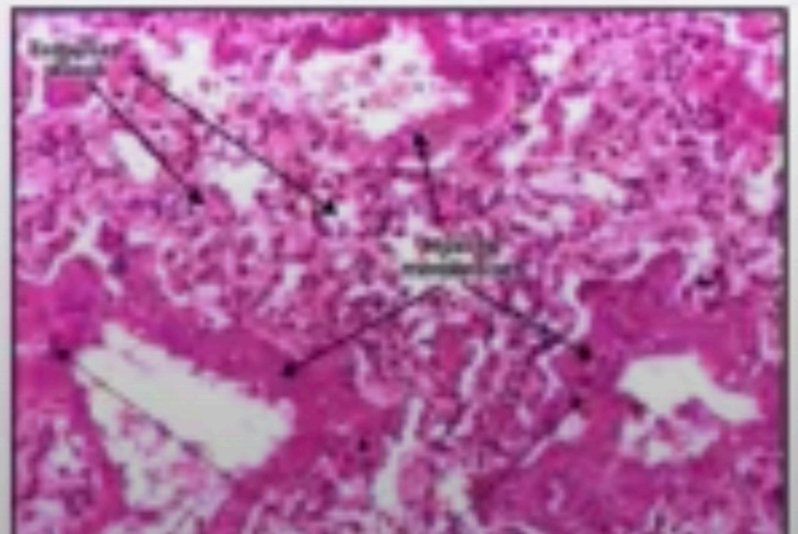
Clinical Presentation

- Respiratory distress
- Increased O2 requirement
- Onset shortly after birth
- Classical radiographic finding

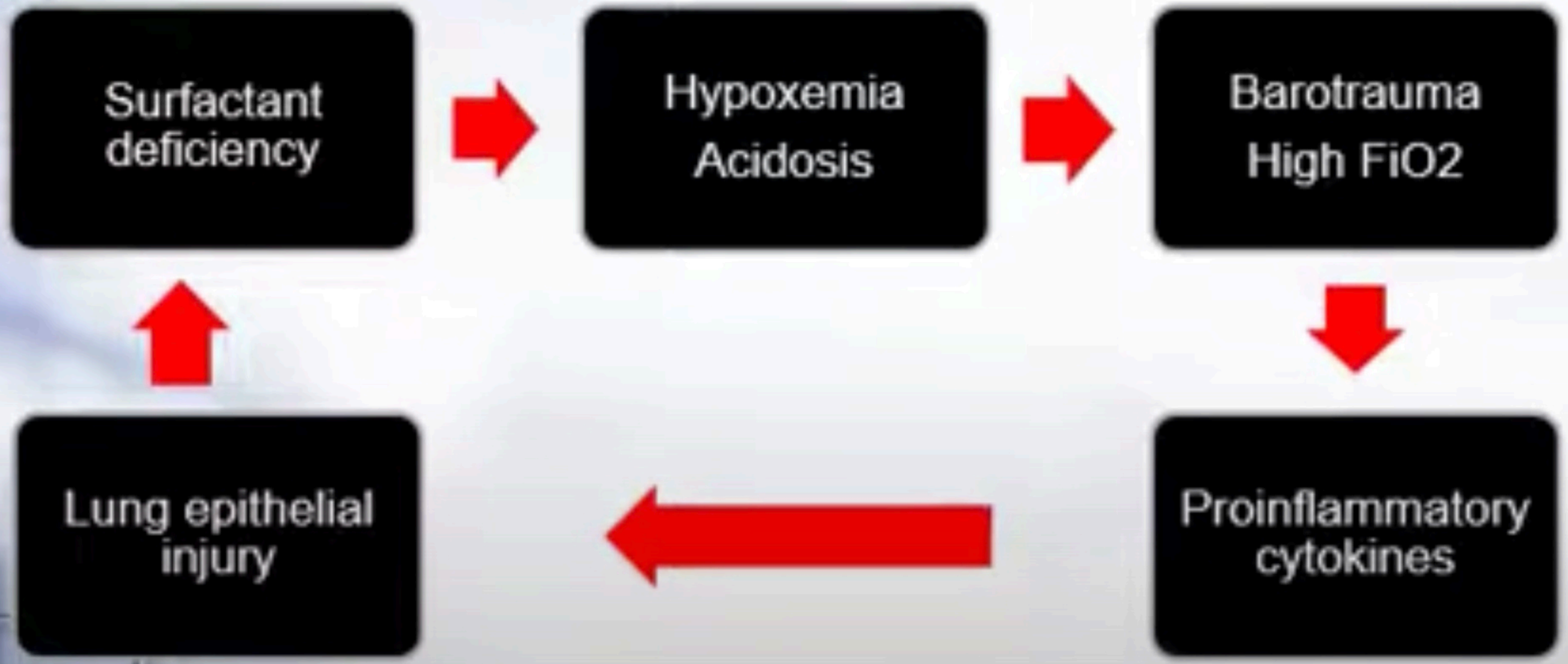
Pathology

- **Macroscopic appearance : ruddy and airless resembling hepatic tissue**
- **Microscopically : diffuse atelactasis**

Eosinophilic membrane lines the airspaces



Pathophysiology



Complications

Hypoxemia

Acidosis

Air leaks

Infection

PDA

IVH

Chronic lung disease

Developmental outcome

Prevention 1

Prevent Prematurity

Prevention 2

Antenatal steroids

Prevention of asphyxia

Treatment

- General supportive measures
- Surfactant
- Gentle assisted ventilation

Correction

Meconium aspiration syndrome

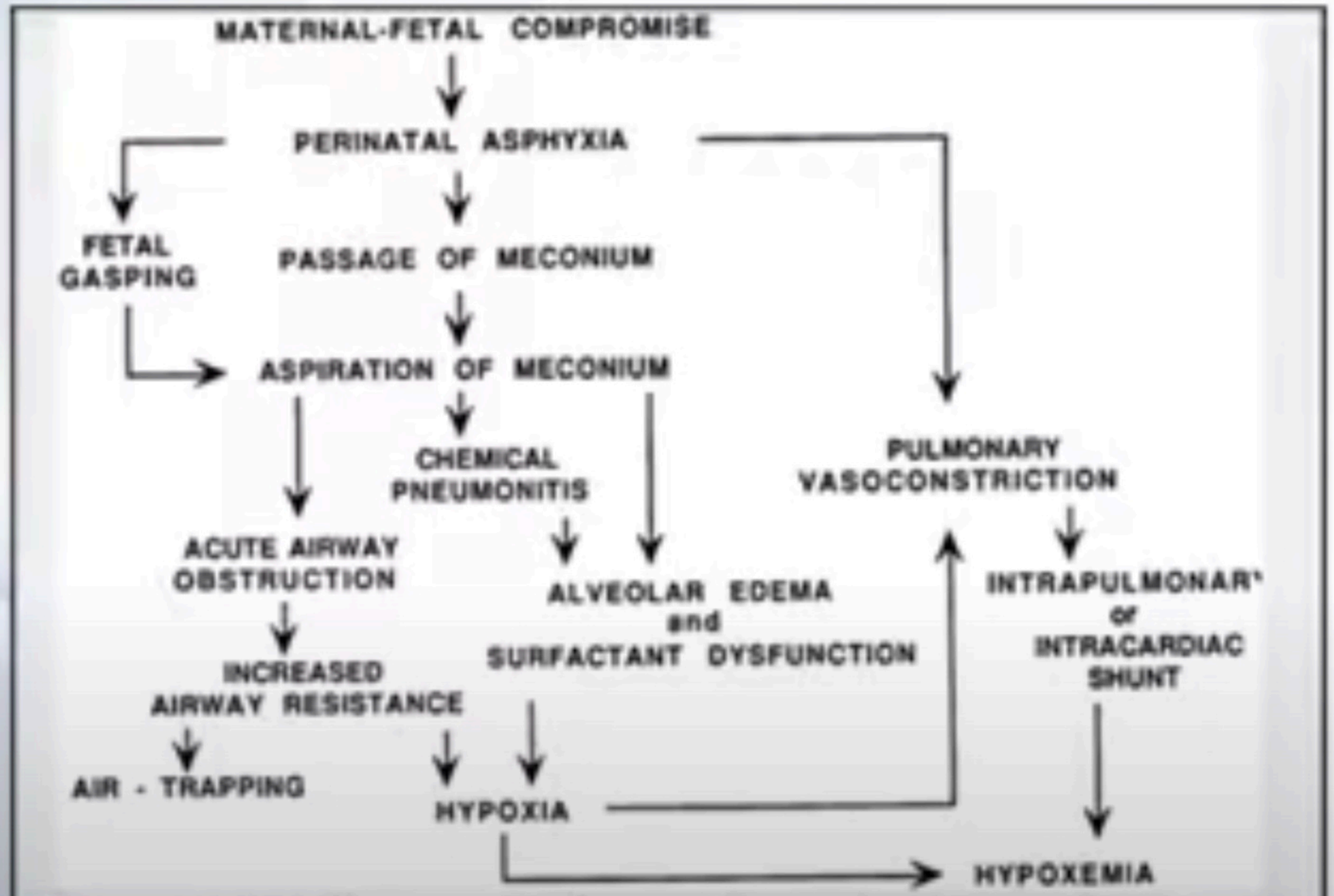
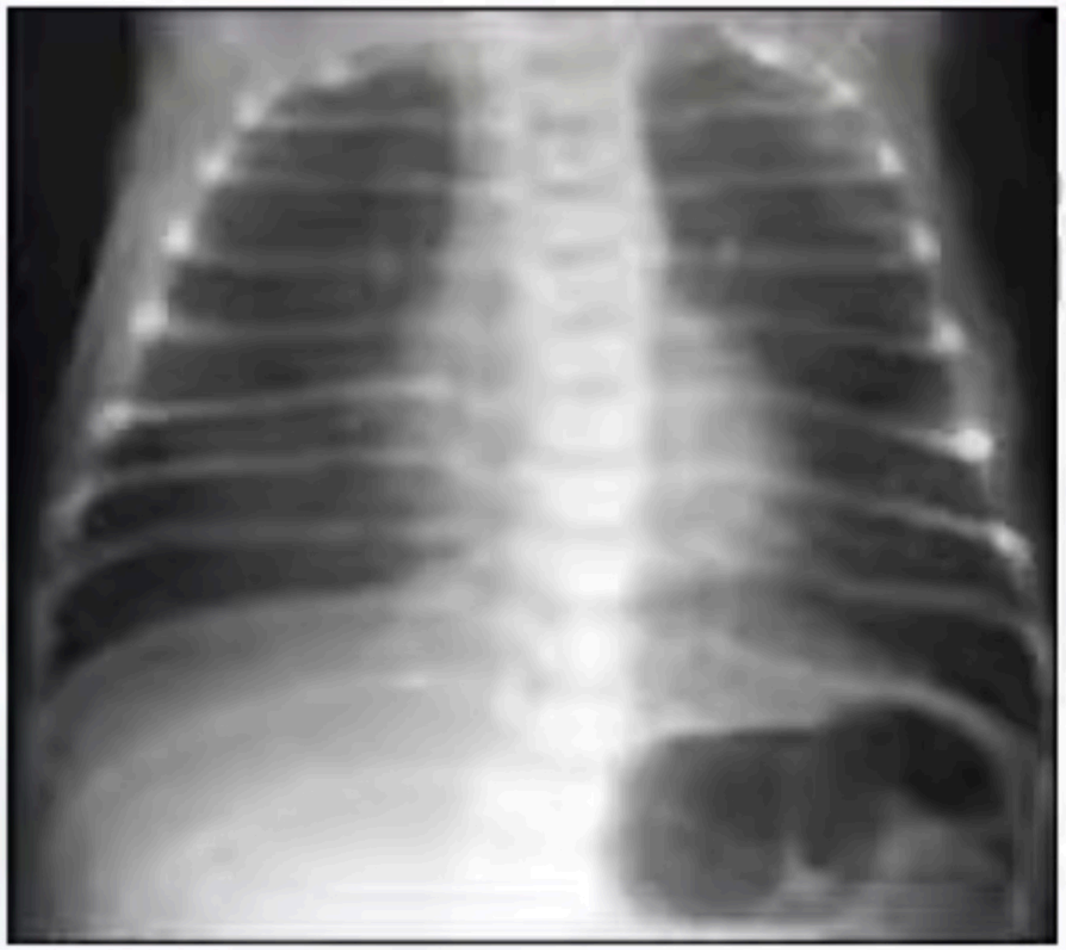


Figure 29-8 Pathogenesis of meconium aspiration syndrome.

Transient tachypnea of the newborn

- In whom
- Why ?
- Clinical Features & course
- Treatment



Case scenario

- A 25 weeks GA newborn
- Birth weight 600 gm
- Delivery room management
- Expected respiratory complication
- NICU respiratory care
- Long term respiratory complication

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