

# Thoracic Complications

## Pulmonary Hypoplasia

- Decrease in the number of lung cells, airways, and alveoli
  - =Decrease in organ size and weight.
- Causes
  - MCC
    - Oligohydramnios/anhydramnios
    - Small thoracic cavity (Congenital anomalies)
      - +esophageal anomalies = look for absent lung
    - Masses
      - Including Pleural effusion
- Poor prognosis
  - 80% die after birth
  - Renal anomalies= lethal
  - Small Echogenic lungs lateral to Cardiac chambers
  - Small Thoracic circumference below the 5th percentile
    - Not helpful when intrathoracic mass present
- Also look for :
  - Chromosome anomalies
  - Renal anomalies
  - Intrauterine growth restriction (IUGR)
  - Premature rupture of membranes
  - Masses within thoracic cavity
    - Hernia
    - Pleural effusion

## Amniocentesis

- To assess lung maturity
- Done shortly before delivery

- Help prevent respiratory distress syndrome (RDS) if fetal lung maturity testing is positive before delivering fetus.
- Tests based on:
  - biochemical testing for active components of surfactant
  - biophysical testing for functionality of surfactant
  - physical testing of the opacity of amniotic fluid
  - ultrasound evaluation of the fetus and its tissues

## Diaphragmatic Hernia (CDH)

- Herniation of the abdominal organs entering the fetal chest
  - Small to large or complete absence of both diaphragms
- Occurs in 1 per 2000 to 1 per 5000 births
- MC posterior aspect of diaphragm on left side
  - Through the foramen of Bochdalek
  - > 90% of defects
- Cause unknown
- Not associated with other syndromes
- Prognosis
  - Survival ~65%
  - Pulmonary Hypoplasia
- Sono:
  - Stomach, spleen, and portions of the liver (LT sided hernia)
    - Shift heart + mediastinal structures to RT side of chest
      - Stomach (fluid filled) in chest near heart
      - Absence of fluid filled stomach in abd.
      - Bowel/liver in chest

## Ectopia Cordis

- Congenital malformation
- Heart is located partially or totally outside the thoracic cavity.
- Main ectopic positions are:
  - (Adjacent to) Thorax: ~60%
    - Heart anterior to sternum
  - Abdominal: 15-30%
    - ◦ Heart lies within the abdomen
  - Thoracoabdominal: 7-18%
    - ◦ Heart lies between thorax and abdomen
  - Cervical: ~3%
    - Lies within or on top of the neck
- Associated with:
  - Ventricular septal defects
  - Tetralogy of Fallot
  - Omphalocele
  - Turners Syndrome
  - Chromosomal Anomalies
- Prognosis
  - Poor
  - Surgical correction may be attempted
    - Correction depends on severity of intracardiac malformations and the presence of associated abnormalities.
  - Most infants are stillborn or die within hours or days of life.

## Congenital Cystic Adenomatoid Malformation (CCAM)

- AKA congenital pulmonary airway

malformation (CPAM)

- Multicystic mass of primitive lung tissue
  - Solid,
  - Cystic
  - combination
  - Large or small
- Foregut malformation involving:
  - One or more lobes of the lung
  - Entire lung
  - Bilateral (Rare)
- Sono may be normal in 1st and 2nd tri
- Rare (1 in 25,000 pregnancies)
- Unknown cause

### TYPE I

- Macrocystic
- One or more large cysts replace normal lung tissue
- Cysts= 2 cm - 10 cm

### TYPE II

- Macrocystic with a microcystic component
- Multiple small cysts
- < 1 cm
- Associated w/ fetal and/or chromosomal abnormalities (25%)
  - renal agenesis, pulmonary anomalies, and diaphragmatic hernia

### TYPE III

- Microcystic
- bulky, large, (noncystic) echo-dense masses of the entire lung lobe
- Shift of mediastinal structures= lung compression + hydrops may develop.
- Hydramnios secondary to esophageal compression, preventing normal fetal swallowing.

## Cystic Lung Masses: Bronchogenic Cysts

- MC lung cyst detected prenatally
  - Unilocular or multilocular cysts
- Occur within the mediastinum or lung
  - inferior to the diaphragm (rare)
- Normal amniotic fluid
- Sono:
  - Small circumscribed masses
  - No evidence of a mediastinal shift or heart failure

## Cystic Lung Masses: Congenital Hydrothorax

- AKA Pleural effusions
- Accumulation of fluid within the pleural cavity
  - fetal chylothorax-> lymphatic fluid within the pleural cavity
  - fetal hydrothorax-> fetal thoracic cavity
- Isolated lesion or secondary to multiple fetal anomalies
- Unilateral or bilateral
- MCC malformed thoracic duct
  - Causes right-side unilateral collection of fluid
  - + Esophageal compression
- Sono:
  - Lung compression and heart displacement
  - Echo-free peripheral masses on one or both sides of the fetal heart
  - conform to the thoracic cavity

## Bronchopulmonary Sequestration (BPS)

- Benign mass of non-functioning lung tissue
  - Supernumerary lobe of the lung

(separated from the normal tracheobronchial tree)

- Intralobar--within the pleural lung sac
  - Extralobar --connected to the inferior lung in its own pleural sac
- Foregut malformation
- Sono
  - Serial ultrasounds performed to assess growth
  - Color Doppler demonstration of sequestered lobe arising from the abdominal aorta.
  - Echo-dense solid mass resembling lung tissue
  - Usually in the lower lobe of the lung
  - Hypoplastic lung (on same side)
  - Extralobar
    - A majority occur on the left side
    - rarely below the diaphragm
    - Cone-shaped or triangular mass
  - Intralobar
    - Spherical lesion
- Associations:
  - hydrops and
  - polyhydramnios,
  - Diaphragmatic hernia
  - gastrointestinal anomalies
- Prognosis:
  - intralobar sequestration = highly favorable
  - extralobar sequestration = poor prognosis a
    - associated anomalies and hydrops

