PLEURA- LESIONS

LESIONS OF PLEURA

• Primary
  – Intra pleural bacterial infections
  – Neoplasm (mesothelioma)

• Secondary
  – A complication of some underlying disease

PLEURAL EFFUSION

• Common manifestation of both primary and secondary pleural diseases
  – Inflammatory
  – Non Inflammatory

• Occurs in following settings
  • Increased hydrostatic pressure (CHF)
  • Increased vascular permeability (Pneumonia)
  • Decreased oncotic pressure (Nephrotic Syndrome)
  • Increased intrapleural negative pressure (atelactasis)
  • Decreased lymphatic drainage (mediastinal carcinomatosis)

INFLAMMATORY PLEURAL EFFUSION

• Serous
• Serofibrinous
• Fibrinous (later)

Causes
• Tuberculosis
• Pneumonia
• Lung infarcts
• Lung abscess
• Bronchiectasis

• RA
• DLE
• Uremia
• Diffuse systemic infections
• Metastatic involvement of pleura
• Radiation therapy for tumors in lung or mediastinum
EMPYEMA

- Purulent pleural exudate
- Usually results from bacterial or mycotic seeding by contagious spread from intrapulmonary infection
- Occ through lymphatic or hematogenous dissemination
- Rarely sub-diaphragmatic or liver abscess may extend by continuity
- Characterized by loculated, yellow-green, creamy pus composed of masses of neutrophils admixed with other leukocytes
- Usually in small volume and localized (but may be large)
- Usually organized into dense, tough fibrous adhesions frequently obliterating the pleural space or envelop the lungs--- restrict pulmonary expansion

HEMORRHAGIC PLEURITIS

- Infrequent
- Found in hemorrhagic diathesis, rickettsial diseases, neoplastic involvement of pleural cavity
- Sanguineous inflammatory exudates
- Careful search should be made for presence of exfoliated tumor cells

NON INFLAMMATORY PLEURAL EFFUSION

- Also called hydrothorax
- Fluid is clear and straw-colored
- Uni/bilateral depending on underlying cause
- Found in cardiac failure, renal failure and cirrhosis of liver
- Accompanied by pulmonary congestion and edema

HEMOTHORAX

- The escape of blood into the pleural cavity
- May occur post-operatively
- A fatal complication of a ruptured aortic aneurysm or vascular trauma

CHYLOTHORAX

- Accumulation of milky fluid in the pleural cavity
- Chyle contains finely emulsified fat
- Most often caused by thoracic duct trauma or obstruction (malignant conditions)

PNEUMOTHORAX

- Presence of air or gas in pleural cavities
  - Spontaneous
  - Any form of pulmonary disease as causes rupture of an alveolus
  - Any abscess communicating directly or indirectly with the pleural space
  - Traumatic
  - Therapeutic
• Most commonly associated with emphysema, asthma and tuberculosis
• Resorption occurs slowly in spontaneous and traumatic pneumothorax
• **Spontaneous idiopathic pneumothorax** is encountered in relatively young people
• Also causes compression, collapse and atelectasis resulting into marked respiratory distress
• In **Tension pneumothorax** the defect acts as a flap valve and permits the entrance of air during inspiration but fails to permit escape during expiration

**PLEURAL TUMORS**

• Secondary metastatic involvement is far more common than primary tumors
• Most frequent metastatic malignancies arise from lung and breast followed by ovarian carcinoma
• Careful cytologic examination of the sediment is of considerable diagnostic value

**SOLITARY FIBROUS TUMOR**

• Previously called benign mesothelioma, benign fibrous mesothelioma, fibroma
• Recognized as a soft tissue tumor mostly occurring in the pleura, less commonly in the lung, as well as other sites
• Variable size but confined to surface of lung
• Grossly consisting of dense fibrous tissue with occasional cysts filled with viscid fluid
• M/S whorls of reticulin and collagen fibers with interspersed spindle cells resembling fibroblasts
• Rarely malignant (pleomorphism, mitotic activity, necrosis and > 10 cm)
• CD34+, keratin –ve (opposite in malignant lesion)
• No relationship to Asbestos exposure

**MALIGNANT MESOTHELIOMA**

• Arising from visceral or parietal pleura
• Uncommon but incidence is increased among people with heavy exposure to Asbestos (90%)
• Long latent period of 25-45 yrs
• No increased risk in asbestos workers who smoke
• Deletion in Ch 1p,3p, 6q, 9p, 22q….. 60-80%
• P16 mutations….. 31%
• Presence of SV40(potent carcinogen inactivating p53 and RB etc) in 60-80% cases
MORPHOLOGY

- Diffuse lesion, spreading widely in pleural space, usually associated with extensive pleural effusion
- Affected lung become ensheathed by a thick layer of soft, gelatinous, greyish pink tumor tissue
- M/S may be epithelioid, sarcomatoid or mixed

MORPHOLOGY - EPITHELIOID

- Cuboidal, columnar, or flattened cells forming tubular or papillary structures resembling adenocarcinoma
- Positive staining for acid mucopolysaccharide
- Lack of staining for CEA
- Strong staining for keratin
- Positive staining for calretinin, WT-1, CK5/6 and D2-40
- Sarcomatoid or mixed
MORPHOLOGY- EPITHELIOID

• Long microvilli and abundant tonofilaments seen on E/M

MORPHOLOGY

• Sarcomatoid
• Spindle cell carcinoma
• Resembling fibrosarcoma
• Mixed type
• Containing both patterns

CLINICAL COURSE

• Chest pain, dyspnea and recurrent pleural effusion
Concurrent asbestosis (20% cases of pleural and 50% of peritoneal mesotheliomas)
Invasion to lung
Metastasis to hilar LN, liver and other distant organs
50% of patients die within 12 months
Few survive longer than 2 yrs
Extra-pleural pneumonectomy, chemotherapy, and radiation therapy is some helpful in cases of pleural mesothelioma

MESOTHELIOMA
Mesothelioma also arise in the peritoneum, pericardium, tunica vaginalis and genital tract
Peritoneal Ms are related to Asbestose exposure(50%)
50% also have pulmonary fibrosis
Intestinal involvement frequently leads to death due to obstruction

THANKS