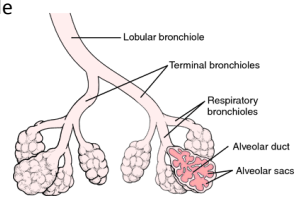
Pneumonia

Dr Roshitha de Silva
Department of Pathology
Faculty of Medicine
University of Kelaniya

Pneumonia

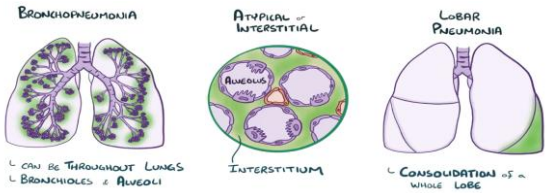
- Acute inflammation of lung parenchyma distal to the terminal bronchioles
- Consist of
  - Respiratory bronchiole
  - Alveolar ducts
  - Alveolar sacs
  - Alveoli



Classification

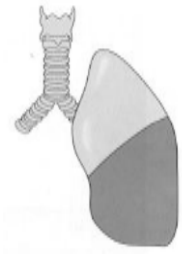
- Aetiology
  - Bacteria
  - Virus
  - Fungal
- Site
  - Lobar pneumonia
  - Bronchopneumonia
  - Interstitial pneumonia
- Patient setting
  - Community acquired
  - Hospital acquired
- Immune status
  - Healthy
  - Immuno-compromised

Classification according to site



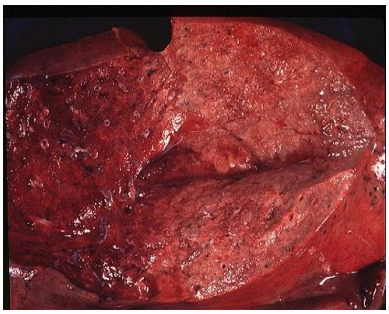
Lobar pneumonia

- Acute bacterial infection of an entire lobe or a part of the lobe
- 95 % of cases by Streptococcus pneumoniae
- Lobar pneumonia evolves in four stages.
  - Congestion
  - Red hepatisation
  - Grey hepatisation
  - Resolution



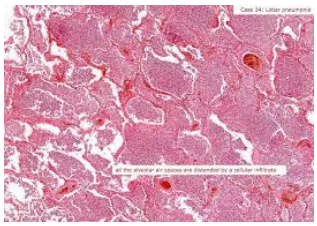
Congestion

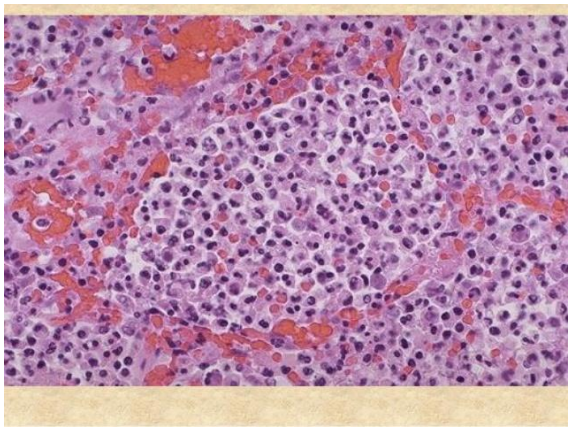
- Macro
  - Heavy
  - Boggy
  - Red



Congestion

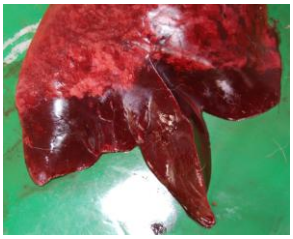
- Micro
  - Vascular engorgement
  - Intra-alveolar fluid
  - Few neutrophils
  - Numerous bacteria





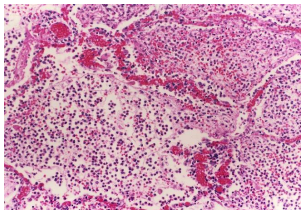
Red Hepatisation

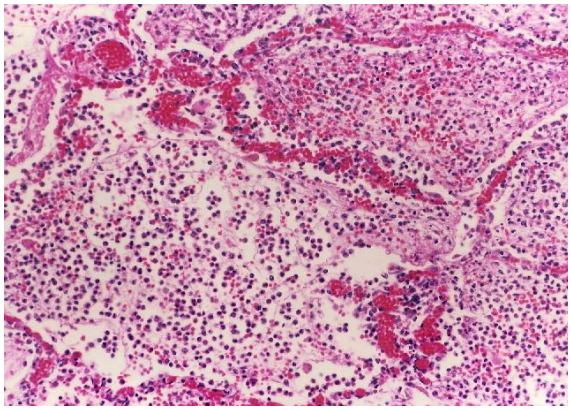
- Macro
  - Red
  - Firm
  - Airless
  - Liver-like consistency



Red Hepatisation

- Micro
- Massive exudation of
  - Neutrophils
  - Red cells
  - Fibrin in the alveolar spaces





Pleuritis

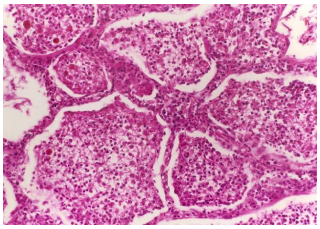
- A pleural reaction is also associated if the consolidation extends to the surface
- Inflammation of the pleura
- Fibrinopurulent exudate→pleural effusion
- Exudate
  - Resorbed
  - Organized by fibroblasts
    - Leading to fibrous thickening
    - Adhesions → fibrinous tags

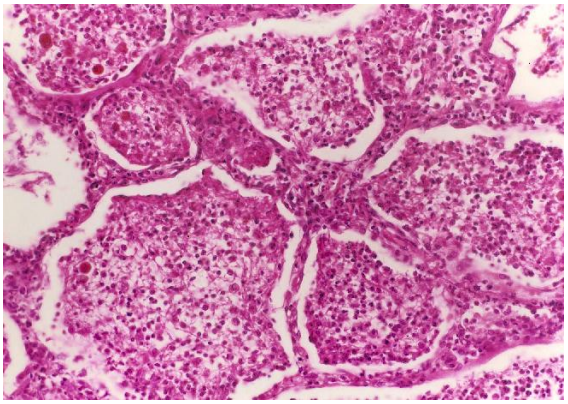
Grey Hepatisation

- Macro
  - Greyish brown
  - Dry surface

Grey Hepatisation

- Micro
  - Progressive disintergartion of rbc
  - Persistence of a fibrinosuppurative exudate





Resolution

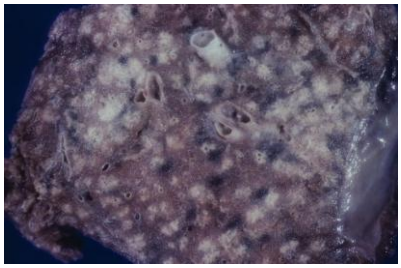
- Enzymatic digestion of consolidated exudate
  - Debris absorbed by macrophages
  - Expectorated
- Restoration of normal lung parenchyma
- Pleuritis may resolve or undergo organisation→fibrous thickening or permanent adhesions

Bronchopneumonia

- Infection of the terminal bronchioles
- Results in patchy consolidation
- Common in
  - Extremes of life
  - 2ry infection following viral infection
  - Chronic debilitating illness

Bronchopneumonia

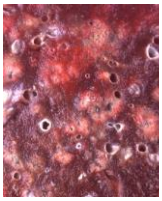
- Consolidation is patchy
  - Multilobar
  - One lobe
  - Bilateral
  - Basal



Bronchopneumonia morphology

Macroscopy

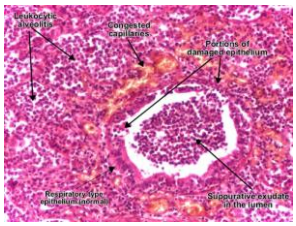
- Areas of red/grey consolidation
- Cut surface
  - 3-4 cm in diameter
  - Poorly demarcated margins
  - Elevated, dry, granular, firm
  - Centered around a bronchiole
- Unaffected areas appear normal

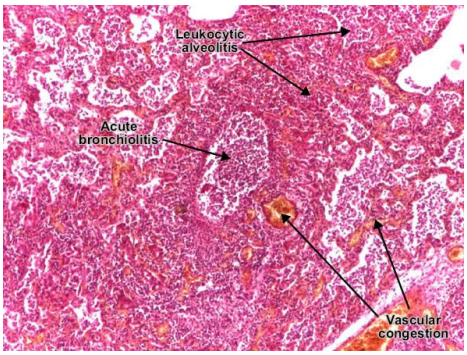


Bronchopneumonia morphology

Microscopy

- Acute bronchiolitis
- Suppurative exudate in bronchioles
- Inflammation in surrounding alveoli
- Less involved alveoli contain oedema fluid





Complications

- Organisation
  - Resolution does not occur
  - Fibrosed, tough, airless leathery lung tissue
  - Results in carnification

Complications

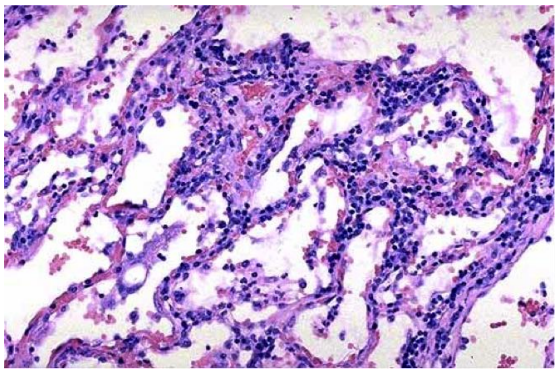
- Pleural effusion
- Empyema
- Lung abscess
- Metastatic infection
  - Infection may extend into the pericardium and the heart→purulent pericarditis, bacterial endocarditis, myocarditis

Complications

- Bronchopneumonia
  - Complete resolution is uncommon
  - There is some degree of destruction to the bronchiole
  - This results in foci of bronchiolar fibrosis and end up with bronchiectasis

Atypical pneumonia

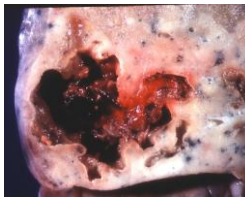
- Caused by atypical bacteria and viruses
- 'Walking pneumonia'
- Macroscopy
  - Patchy or lobar areas of congestion
  - Pleura is not affected
- Microscopy
  - Interstitial inflammation
  - Alveoli are unaffected



Lung abscess

- Localised area of necrosis of lung tissue with suppuration

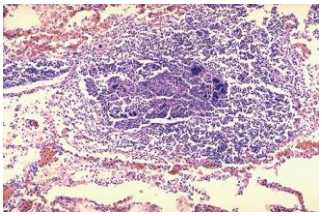
Lung abscess



- Macro
  - Single/multiple
  - Basal/scattered
  - Poorly defined ragged wall
  - Abscess cavity is filled with exudate
  - Advance abscess- fibroblastic proliferation →fibrous wall

Lung abscess

- Micro
  - Destruction of the lung parenchyma
  - Suppurative exudate
  - Cavity initially surrounded by Acute infla cells then by macs, lymphocytes



Thank You