Systematic Anatomic Pathology

Respiratory System

Systematic Anatomic Pathology

Malformations

- **Numeric – in defect:**
  - **Bilateral pulmonary agenesia**
    - Associated with failed laryngo-tracheal sepimentation
  - **Monolateral pulmonary agenesia**
    - Complete absence of lung
    - Trachea devoid of keel (dd.: aplasia)
    - Omolateral pulmonary artery ramus agenesia
    - Vagus nerve agenesia
    - Contralateral compensatory hypertrophy
    - Often associated with malformations of:
      - Heart and aorta
      - Vertebro-costal skeleton
      - diaphragm and digestive apparatus

Systematic Anatomic Pathology

Malformations

- **Numeric – in defect:**
  - ⇨lobar agenesia/aplasia
  - more frequent to the right (superior and median lobi)
    - Vasculo-nervous agenesia
    - Independent from fissures
    - Compensatory hypertrophy
  - ⇨lobular hypoplasia
    - simple = lack of bronchial tree branches

      reduced amount of alveolar parenchyma

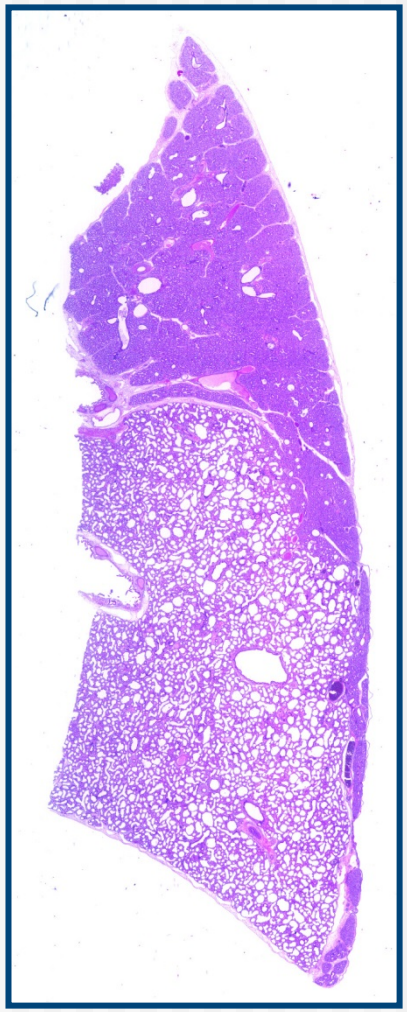
      pulmonary structure nearly unaltered
    - cystic = block of respiratory tree development

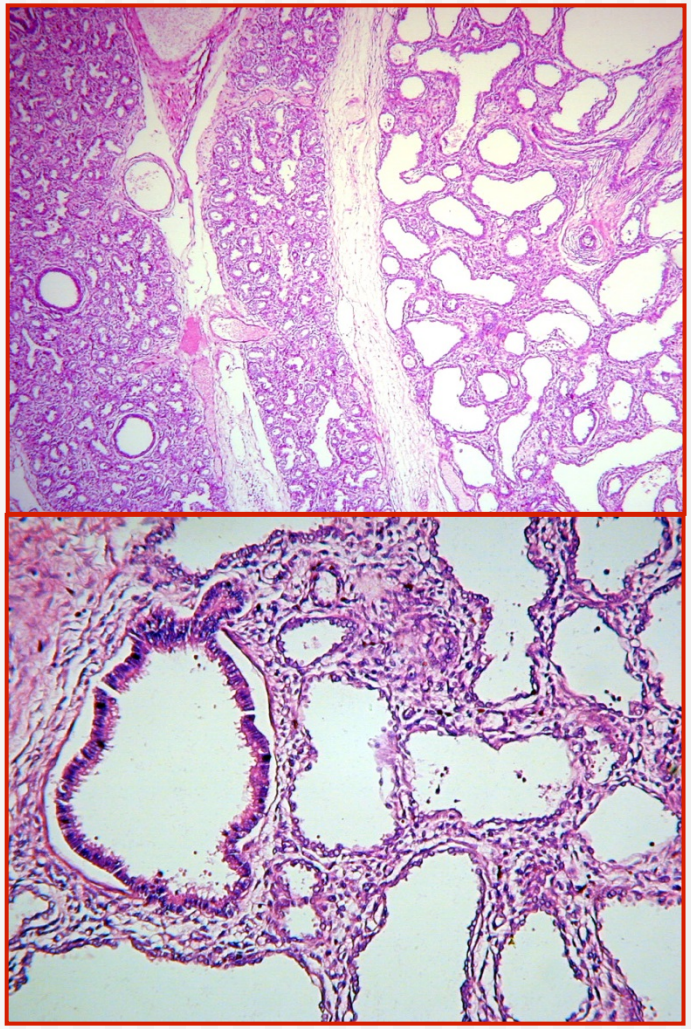
      global: bronchial anarchic structure (early)

      partial = cystic adenomatous malformation

Systematic Anatomic Pathology

Adenomatoid Malformations





Systematic Anatomic Pathology

Malformations

- **Numeric – in defect:**
  - ⇨Partial policystic lung
  - ⇨Aerial cysts
  - ⇨Enterogenous cysts (stomach, pancreas, ileum)

- Alterations compatible with life are often clinically silent.
- They cause clinical symptoms (>40 aa.) due to infections or haemorrhagic complications
- DD.: bronchiectasias

Systematic Anatomic Pathology

Malformations

- **Numeric - in excess:**
  - ⇨ **Supernumerary lung / lobes**
    - With autonomous broncho-vascular system
    - apical
  - ⇨ **Supernumerary fissures**
    - Median lobe (lingular) to the left
    - Basal medial fissure, right (paracardiac lobe)
    - Inferior fissure, right apical (Deve-Fowler lobe)
    - Apical right fissure
  - ⇨ **Accessory pseudofissures**
    - Vascular, pleuric and costal sulci
    - Azigos vein lobe

Systematic Anatomic Pathology

Malformations

Numeric - in excess:

- ⇨ **Sequestration**: derived from supernumerary drafts or lobes separated from the principal ones
  - separation of a tract of lung, whose extension is lobar or segmentary, due to the lack of a bronchus (no ventilation)
  - autonomous **aortic** vascularization
  - organoid configuration and cystic structure similar to fetal lung
- ***extralobar sequestration***: dense mass, ovoidal, extra-pulmonary, 2-8 cm, with mediastinic / aortic / gastro-oesophageal peduncles, clinically silent.
  - Associated with total/partial agenesia of the lung
  - Without pulmonary alterations (accessory gem)
  - Analogous to mediastinic, costal bronchogenic cysts
  - Azygous vein lobe

Systematic Anatomic Pathology

Malformations

Numeric - in excess:

- ***intralobar sequestration*** (intrapulmonary): postero-inferior region of the inferior lobes
  - Pryce type: 1-2 segmental agenesic bronchi + hypoplasia of the omolateral pulmonary artery ramus (arises from the separation of a pulmonary draft)
  - Le Brigand-Dupré type: interposed between branches of segmental bronchi (derived from accessorial draft)

Intralobar sequestrations cause late clinical manifestations, due to inflammatory and haemorragic complications

Systematic Anatomic Pathology

Malformations: sequestrations

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Systematic Anatomic Pathology

malformations

- **Mirror-like lung**: symmetry of both lung
  - ⇨ Right / left isomerism, the left is often letal because accompanied by additional severe congenital alterations
  - ⇨ The right inferior lobe is vascularized by the branches of thoracic aorta and drains blood into the inferior vena cava or in azygos vein. **Cianosis**, cough, dyspnoea
- **Bronchial stenosis**
  - ⇨ extrinsic (abnormal vessels)
  - ⇨ intrinsic (diaphragm, malacic cartilage)
    - Acute emphysema
- **Fistulas** broncho-oesophageal (traction diverticula)

Systematic Anatomic pathology

Pulmonary hypertension

- Increased pressure regimen in pulmonary arterial circulation
- (lung vascular sclerosis)
- Right ventricular hypertrophy
- Chronic pulmonary heart disease

- **Idiopathic**
  - Young, females (5-10 aa.)
  - Sympathetic hyperactivity
  - Microembolism, arterial wall damage
  - Autoimmune process involving the stroma of pulmonary vessels
    - Primitive damage of pulmonary endothelium
    - Chronic vasocostriction
    - Pulmonary hypertension
    - Vascular sclerosis
    - Raynaud phenomenon

Systematic Anatomic Pathology

Pulmonary hypertension

- **Secondary** to a pre-existent pathological situation
  - ⇨ **Parenchymal lesions**
    - Emphysema (pulmonary circulation), pulmonary fibrosis
    - Chronic bronchitis
    - Bronchiectasia, abscess and pneumonia (fibrosis), fistulous **vascular lesions**
    - Microembolisms
    - Panarteritis Nodosa and Wegener disease
  - ⇨ **Respiratory failure**
    - (hypercapnia – respiratory acidosis – arterial stenosis)
    - Compensatory polyglobulia (hyperviscosity - resistance)
    - Kyphoscoliosis, Pott disease (Tb), Polio
    - Muscular dystrophy
  - ⇨ **Central respiratory deficit**
    - Head trauma
    - Major surgery

Systematic Anatomic Pathology

Pulmonary hypertension

Morfology:

- Lesions of pulmunary arterial branches similar to those of sistemic arterosclerosis, of lesser severity.
- Anelastic lung, pale or brownish
  - Elastic arteries: uncomplicated intimal plaques
  - Musclular arteries: hypertrophy, intimal, eccentric thickening, delamination
  - Fibrinoid necrosis + inflammation (PMN)
  - Re-canalized platelets thrombi (plexiform lesions)

Systematic Anatomic Pathology

Disorders of circulation

Stasis (congestion or passive hyperemia)

- ⇨ acute
- ⇨ Cronic

Caused by obstacles to venous outflow

- systemic (VS+VD)
  - Heart global failure
  - Dilatative/obstructive cardiomiopathy
- pulmonary (VS)
  - mitral stenosis
  - myocardial infarction
- local (local problems of venous drainage)
  - neoplasms
  - malformations

Systematic Anatomic Pathology

Disorders of circulation

Lung with acute stasis:

- Tumid
- Congested and reddish
- Increased volume and weight
- Dampish
- Fluid blood, diffluent on cut section
- Massive congestion of interstitial capillaries

Systemic anatomic pathology

Circulatory disorders

- **Chronic lung stasis** ***(brown induration)***
  - Macro:
    - Rigid
    - Red-dark brown, dry
    - Increased consistency, weight and volume
    - Leakage of dense blood on section
  - Micro:
    - Dilated and congested capillaries, aneurysmatic dilations
    - Endoalveolar microhaemorrhages
    - Erithrophagocytosis and iron rich macrophages (due to cardiac alteration)
    - Thickening of septa + edema, interstitial fibrosis
    - Vascular sclerosis (pulmonary hypertension)

Systemic anatomic pathology

Circulatory disorders

- **Oedema** = Accumulation of fluid in the interstitial spaces of the lung
  - ⇨ ***Central causes (cardiogenic) – systemic edema***
    - Myocardial infaction, left valve disease, pericarditis etc.
  - ⇨ **Local venous obstruction** – localised oedema
  - ⇨ **Changes in osmotic pressure (renal, liver disease)**
    - >hydrostatic pressure in pulmonary capillaries
    - Capillary congestion
    - Transudation of fluid in the interstitial spaces
    - Lymphatic drainage
    - Accumulation into the alveoli (alveolar phase = acute edema)
    - Accumulation into the interstitial space (**interstitial phase** = chronic edema)

Systemic pathologic anatomy

Circulatory disorders

- **Acute pulmonary edema**

  (>>>cardiogenic, renal, hepatic)

  - Leakage of foamy fluid from main bronchi
  - Lungs are bulky and heavy, they don't retract (elastic recoil)
  - "fovea"
  - Moisty, pinkish-dark brown
  - Alveoli contain homogeneous eosinophilic fluid

Systemic pathologic anatomy

Circulatory disorders

ARDS adult respiratory distress syndrome

"Shock-like lung"

- Infections, septic shock
- Pancreatitis (degradation of surfactant by phospholipases)
- Burns, trauma, toxins (fosgene, hyprite, narcotics, NO2), iper-O2

Damage to respiratory barrier by superoxides, activation of C5a, proteases

- Macro: similar to acute edema
- Micro: endoalveolar transudate
  hyaline membranes (4ª day)
  interstitial inflammation
  repair by type II pneumocytes (gland-like)
  fibrotic organisation

Systemic pathologic anatomy

Circulatory disorders

Other pulmonary oedemas

- Neurogenic oedema (systemic arterial vasoconstriction)
- *Post-transfusional oedema (with renal failure or cardiomyopathy)*
- *High altitude pulmonary oedema (peripheral vasoconstriction)*
- *Silo workers oedema (NO2)*
- *Uremic oedema, perihilar (butterfly shadow), chronic, toxic*

Systemic pathologic anatomy

Circulatory disorders

Embolism

Presence of material insoluble with blood, carried away from its origin, reaching a smaller blood vessel in occlusive position

- solid (thrombi, clots, neoplasms, chorionic villi, bone, Ca++)
- liquid (amniotic fluid, lipophilic solutions)
- gaseous (trauma, pneumothorax, N2)

- Outcome depends on:
  - Type of circulation (terminal, collateral)
  - Quickness
  - Size of obstructed vessel

Systematic Anatomic Pathology

Blood flow disturbances

Embolism

- Sources:
  - Lower limbs
  - Pelvic venous plexes (IVC tributaries)
  - Right heart (5%) (fibrillation)
- Pathogenesis of embolism:
  - Phlebothrombosis
  - Stasis of blood
  - Scarce inflammatory component
  - Fibrinolytic therapy

Systematic Anatomic Pathology

Blood flow disturbances

Embolism

- Location:
  - ⇨**Pulmonary artery or principal trunks:**
    - Sudden pulmonary hypertension
    - Acute hypoxia
    - Right heart failure
  - ⇨**Lobar branches:**
    - Collapse and stabbing pain
    - Pulmonary hypertension (serotonin)
    - Pulmonary heart disease
    - Pulmonary infarction
  - ⇨**Intralobar branches:**
    - +/- asymptomatic
    - Downstream haemorrhage due to endothelial damage

Systematic Anatomic Pathology

Blood flow disturbances

Embolism

- DD: Postmortem embolus / thrombus / clot
  - Shape with respect to the vessel (smaller / = / variable)
  - Adherence to the wall (adherent / strong / weak)
  - Color (red / white-reddish / gelatinous)
  - Consistency (friable / rigid / elastic)
  - Surface (wrinkled / irregular / smooth)

Systematic Anatomic Pathology

Blood flow disturbances

Pulmonary infarction

- The most frequent complication of embolism
- Pulmonary infarction occurs in presence of the following predisposing conditions (**double circulation**):
  - Respiratory insufficiency and/or anemia
  - Pulmonary hypertension (emphysema, COPD)
  - Atherosclerosis of the bronchial aa.
  - Left ventricle insufficiency

Systematic Anatomic Pathology

Blood flow disturbances

Pulmonary infarction

- location: inferior lobes
- shape: conical or pyramidal (consensual fibrinous pleuritis)
- color: red (haemorrhagic)
- consistency: hard
- surface: dry and retracted (in advanced stage)
- evolution: scarring sclerosis
- hystology: haemorrhagic infarction
  coagulative necrosis
  septal and bronchial disruption
  (dd.: haemorrhage with intact septa)

Systematic Anatomic Pathology

Blood flow disturbances

Pulmonary infarction

- Complications:
  - Septic infarct
  - Abscess
  - Haemothorax
  - Pulmonary fibrosis

Systematic Anatomic Pathology

Inflammations of the lung

- Sites of exudate accumulation:
  - Alveoli (pneumonias)
  - Bronchi (bronchitis) o bronco-alveolar (broncho-pneumonia)
  - Interstitium (interstitial pneumonia)
- **Lobar pneumonia** (frank or genuine)
  - ***Diplococcus Pneumoniae*** (rare: Klebsiella Pneumoniae)

    Predisposing factors:

    - ⇨ *Cooling*
    - ⇨ *Metabolic diseases*
    - ⇨ *Alcoholism*
    - ⇨ *Thoracic traumas*
    - ⇨ *"Pneumococcal sensitization"*

Systematic Anatomic Pathology

Inflammations of the lung

Endoalveolar

- Fibrinous (crupal)
- Cyclic
- Adults (hyper-ergic)

- Pathomorphosis induced by antibiotic therapy
- Uni/pluri-lobar, sincrhonous/metachronous
- Right lung, inferior lobes
- Massive parenchimal extension

Systematic Anatomic Pathology

Lobar Pneumonia

- 1st stage of the **haemorrhagic blockade** (max. 24h)
  - *crepitatio indux*
  - > volume amd consistency
  - dark-red colour
  - sero-haemorrhagic liquid at squeezing out
  - Dokimasia weakly +
  - capillary dilation, endo-alveolar sero-haemorrhagic exudate

Systematic Anatomic Pathology

Lobar Pneumonia

- 2nd stage of **red hepatization** (48-72h)
  - *Hepatized sound*
  - >> volume and consistency
  - Dark-red, dry, granular surface
  - Dokimasia +++
  - Reddish, opaque and fibrinous pleura
  - Coagulation of the endoalveolar exudate
  - Haemorrhagic alveolitis + PMN
  - Residual vessel blockade
  - Pneumococcal phagocytosis

Systematic Anatomic Pathology

Lobar Pneumonia

- 3rd stage of **grey hepatization** (24-48h)
  - fibrinolysis, RBC haemolysis, PMN chemiotaxis
  - Reduction of the haemorrhagic blockade
  - Max. > volume and consistency
  - Greysh and granular surface
  - Fibrinous pleuritis
  - Fibrinous-suppurative alveolitis with pale septi

Systematic Anatomic Pathology

Lobar Pneumonia

- 4th stage of **resolution** (24-48h)
  - *"critical" fluidification of the exudate*
  - *crepitatio redux*
  - Volume & consistency +/-
  - Pinkish colour
  - Abundant pinkish fluid at squeezing out
  - Dokimasia +/-
  - Resolution of the fibrinous reticulum
  - Colliquation of PMN
  - Elimination of the exudate
  - Reactive lymphadenitis

Systematic Anatomic Pathology

Lobar Pneumonia

Pulmonary complications :

⇨ **Carnification**

- Lack of reabsorption of the exudate (fibrinolytic deficiency)
- Fibrous organization
- Compact greyish, fleshy areas
- Pleuric adhesions
- *Young* or *old* granulation tissue

⇨ **Abscess and Gangrene**

- Destruction of intra-alveolar septa
- Necrosis and suppurative fusion (para/metapneumonic)

Systematic Anatomic Pathology

Lobar Pneumonia

- **Extra-pulmonary complications** :
  - Pleuric Empyema (para/meta-pneumonic)
  - Suppurative inflammation of mediastinum
  - Suppurativepericarditis
  - Toxic Myocarditis
  - Hepato-toxic jaundice
  - Glomerulonephritis
  - Paralyzed ileum
  - Reactive Splenic Hyperplasia
  - Suppurative ‘metastases’ (meninges, endocardium, peritoneum)

Systematic Anatomic Pathology

Broncho -Pneumonia

- *Klebsiella Pneumoniae, Strepto-Staphylococci, Proteus V, Pseudomonas Aeruginosa, E. Coli*
  - Localised (multiple) lesions (lobular)
  - Mainly affects kids and elderly people (anergic)
  - *It is often a complication of another infectious disease*
- ⇨ Predisposing factors :
  - Local circulatory disturbance
  - Deficit of ventilation
  - Aspiration of infectious material (comatose)
  - Perfrigerations
  - Inhalation of irritating substances

Systematic Anatomic Pathology

Broncho-Pneumonia

- Lesions : **bilateral** , **asymmetric** and **asynchronous**
- Lobular greyish centers
  - > consistency
  - disseminated / confluent / pseudolobar
  - Interposition of airy zones
  - Endobronchial suppurative exudate
  - Fibrino-suppurative consensual pleuritis
  - Scarce fibrinous endo-alveolar component
  - Peri/endo-bronchial PMN exudate
- Slow and asynchronous Resolution

Systematic Anatomic Pathology

Broncho-Pneumonia

- Complications:
  - Empyema
  - Abscess / Gangrene
  - Meningo-endocarditis
  - Mycosis (post-antibiotic treatment)

Systematic Anatomic Pathology

Special types of Pneumonia

Lipidic Pneumonia *(foreign bodies)*

- Caused by penetration of oily substances in the airways, mostly by aspiration
  - Dystrophic infants
  - Elderly
  - Chronic Bronchophatic patients (aerosol)
  - Intubation

Systematic Anatomic Pathology

Special forms of pneumonia

Lipidic pneumonia *(foreign bodies)*

- Origin:
  - ⇨vegetal (olive oil)
    - emulsified, unhydrolyzed
    - eliminated by sputum, modest inflammation
  - ⇨animal (milk, codfish)
    - Hydrolyzed = irritant fatty acids
    - Intense exudation
  - ⇨mineral (paraffin, vaseline)
    - emulsified and phagocysed
    - foreign body granulomas

Systematic Anatomic Pathology

Special forms of pneumonia

- ***Lipidic pneumonia*** *(foreign bodies)*
  - Right lung, inferior lobes
  - Compact appearance, grey-*yellowish*
  - Bronchopneumonia with confluent outbreaks in 4 stages:
    - haemorrhagic stage
    - foamy macrophage stage
    - giant cells + PMN interstitial exudate
    - granulomas and fibrosis
    - healing
  - Possible superinfection = purulent bronchopneumonia

Systematic Anatomic Pathology

Special forms of pneumonia

- ***Loeffler's eosinophilic pneumonia***
  - Fever, cough, asthmatiform dyspnoea, eosinophilia
  - Rx: isolated and fugitive pulmonary infiltrates (24-48h)
  - Bronchopneumonia or pneumonia (sero-fibrinous) with eosinophilia
  - Rare fibrotic evolution

⇨ Ling allergic reaction to airborne antigens (drugs, pollen). Pulmonary migration of Ascaris L.

Systematic Anatomic Pathology

Special forms of pneumonia

- ***Uremic pneumonia***
  - peri-hilar pulmonary edema, “butterfly” - shaped
  - >>> consistency (solid oedema), scarcely diffluent
  - “fovea” +++
  - Increased endoalveolar sero-albuminous fluid, PAS+
  - Fibrin deposition of “hyaline membrane” - type
  - Hyperemia and focal haemorrhages, septal oedema
  - Scarse and rare tendency to fibrosis
- Genesis: altered permeability of the capillary barrier

Systematic Anatomic Pathology

Special forms of pneumonia

- ***Pneumonia due to ionizing radiation***
  - Accidental or therapeutic exposure (breast, lung, mediastinum, thyroid cancer)

    Lesions depend on:
    - Overall dose
    - Duration of exposure
  - Septal capillary congestion
  - Desquamative alveolitis
  - Edema and hyaline membrane due to damaged basal membranes and elastic fibers
  - Epithelial hyperplasia with distinct nuclear pleomorphism
  - Reparative fibrosis

Systematic Anatomic Pathology

Interstitial pneumonia

- Newborns and infants (>>> interstitial connective tissue)
- *Etiology:* ***viral, rickettsial, protozoal***
- Histopathological fetaures dominated by ***lymphomonocytic infiltration and/or interstitial plasma cells***
- Sometimes, secondary infection with alveolar involvement.

Systematic Anatomic Pathology

Interstitial pneumonia

- Primary forms (*primarily interstitial*)
- Secondary forms (from bronchi/alveoli to interstitium)
  - acute / subacute / chronic
  - septal, peribronchial, perivascular, subpleural, interlobular, intralobular, perilymphatic
  - exudative (rare), sero-suppurative (pulmonary lymphangitis)
  - infiltrative - productive (lymphocytes, plasma cells, eosinophils)
  - granulomatous (tbc, sarcoidosis)
  - productive-sclerosing (pulmonary fibrosis)

Systematic anatomic pathology
Interstitial pneumonia

- **Whooping cough** (Haemophilus Pertussis)
  - 4°/6° years of life
    - ⇨Catarrhal stage (angina-like) (3-14 days)
    - ⇨Convulsive stage (3-7 weeks)
    - ⇨Resolution
    - Laryngo-bronchial inflammation
    - Intracytoplasmic inclusions into cylindrical epithelium
    - Lympho-monocytic peri-bronchitis/bronchiolitis
    - Suppurative bronchial pneumonia due to superinfection

Systematic anatomic pathology
Interstitial pneumonia

- Pneumonia due to **Mycoplasma Pneumoniae** (primary, atypical)
  - Poor clinical symptoms (cough)
  - Benign course (2-3 weeks)
  - Complicated by sero-fibrinous pleuritis, interstitial myocarditis, meningoencephalitis and haemolytic anemia
  - Lymphangitic pleural striae
  - Wet and congested lungs with soft areas of thickening
  - Necrotizing peri- bronchitis and bronchiolitis (lymphocytes and plasma cells)

Systematic anatomic pathology
Interstitial pneumonia

- Psittacosis (C. Psittaci)
  - Transmitted by parrots
  - Aggressive evolution
  - Areas of demarcated reddish hepatization
  - Sero-mucous bronchial sputum

  - Lymphocytic/monocytic infiltration
  - Pneumocytes hyperplasia and fibrous endoalveolar exudate
  - Levinthal bodies, cytoplasmic coccoids
  - Capillary thrombosis and haemorragic foci

Systematic anatomic pathology
Interstitial pneumonia

- ***Viral*** *interstitial pneumonia*
  - ⇨Pneumonia and broncho-pneumonia (**Mixovirus**)
    - Often due to superinfections (Haemophilus I.)
    - Associated with interstitial oedema
    - Septal thickening and lympho-monocytic infiltration
    - Associated with myocardial, renal and hepatic degeneration (murky)
  - ⇨**Measles** broncho-pneumonia
    - Appearance in the pre-exanthematous phase
    - Bronchitis , bronchiolitis and lymphocytic peri-bronchitis
    - Pneumocyte hyperplasia
    - Endoalveolar multinucleated giant cells with inclusion bodies

Systematic anatomic pathology
Interstitial pneumonia

- **Cytomegalovirus** pneumonia
  - Newborns and infants
    - - circumscribed form (salivary, pulmonary, renal, hepatic, pancreatic, intestinal)
    - - diffuse form, lethal
  - Diffuse lung involvement
  - Abundant interstitial exudate (lympho-monocytes)
  - Giant epithelial cells with alveolar cytomegalic inclusions (nuclear with paranuclear corpuscles)
  - Desquamation of alveolar epithelium
- Pneumonia due to **Polio, Varicella, Mononucleosis**

Systematic Anatomic Pathology
Interstitial pneumonia

- **Rickettsiosic pneumonia**
  - **Q Fever** (Queensland) (R. Burneti)
  - Septicaemic
  - Transmitted by pets (sheep, cattle)
  - Elimination with fluids and childbirth
  - Penetration by inhalation
  - Silent lung lesions
  - Ground-glass appearance, sublobar
  - **Fissural pleural reaction**
  - Isolated or multiple outbreaks of parenchymal condensations
  - Mononuclear infiltration of alveolar septa
  - High number of macrophages containing Rickettsiae

Systematic Anatomic Pathology
Protozoal Pneumonia

- ***Toxoplasma Pneumonia***
  - Congenital (more frequent)
  - Acquired (rare)
    - Intracellular protozoa; 4-7 μ, Giemsa +
    - Colonizes histiocytes, muscle cells and neural cells
    - Transmucosal penetration

Systematic Anatomic Pathology
Protozoal Pneumonia

- 1st Stage: visceral (8-10 days)
  - Lymphohaematic spread (liver, spleen, lungs)
  - Interstitial histiocytic granulomas
  - Piringer-Kuchinka lymphadenitis
  - Mono-histiocytic interstitial pneumonia, septal
- 2nd Stage: brain-retinal
  - Antibody reaction
  - Hosting in segregated organs (eye, CNS)
- 3rd Stage: chronicity
  - Intracellular pneumocysts for missed rupture of colonized cells
  - Microglial reaction

Systematic Anatomic Pathology
Protozoal Pneumonia

- ***Leishmaniotic Pneumonia***
  - L. Donovani
  - Transmucosal or hematic penetration
  - Perivascular pneumonia, monocyte-macrophage recruitment
  - Histiocytes with Leishman-Donovan bodies

Systematic Anatomic Pathology
Protozoal Pneumonia

- ***Pneumocystic pneumonia***
  - Premature and dystrophic infants
  - Immunosuppressed patients
  - Haemopathy-associated (LNH, LAL)
  - ⇨ Incubation time: 4-6 weeks
  - ⇨ Cough, fever, increasing dyspnea, cyanosis
  - ⇨ Mediastinal and/or subcutaneous emphysema, respiratory failure
  - ⇨ Rx: ground-glass appearance
  - ⇨ Round corpuscles, 4-5 m, with PAS+ capsule

Systematic Anatomic Pathology

Pneumocystic Pneumonia

(P.Carinii)

- Lungs do not crouch
- Increased volume and consistency
- Dark-red color
- Thickening of the lobules (similar to pancreas)
  - Lesions of the alveolar septa:
    - thickening for lympho-monocytic and plasmacell infiltrate
    - hyperplasia of reticular fibers
  - Alveolo-bronchial lesions:
    - Amorphous substance, spongy
    - Beehive-like cells
    - Haematoxylinophilic corpuscles
    - Lack of endoalveolar exudate
  - Fibrotic evolution

LUNG ABSCESS

***Suppurative inflammatory process**, with necrotizing evolution, tending to demarcation, **formation of a new cavity**, communicating with the bronchial tree.*

- Often consequent to aerobics Gram+ bacterial infection
  - ⇨ Abscesses subsequent to bronchopneumonic processes (50% of cases)
    - para/metapneumonic
    - para-bronchiectasias
    - paraneoplastic
  - ⇨ Aspiration abscesses
    - Oral mucosa, tonsils, adenoids surgery
    - General anesthesia and debilitated patients
    - Gastric contents
    - Right lung, inferior lobes

LUNG ABSCESS

- ⇨Haematogenous abscesses
  - Septic embolism
  - Thromboembolism of inferior limbs and pelvis
  - Bacterial endocarditis in drug addicted
  - Endocarditis in malformative cardiopathies
- ⇨Lymphogenic abscesses
  - Purulent infections of pleura and mediastinum
  - Abdominal surgery
- ⇨Abscesses forcontiguity (pleura, vertebrae, liver)
- ⇨Post-traumatic abscesses

LUNG ABSCESS

- Localisation: dorsal segment of superior lobes
- Single/multiple
  - ⇨ 0,5 cm (haematogenous) / 5-10 cm (bronchogenic)
  - ⇨ Grey or grey/yellowish mass
  - ⇨ Tumour-like
  - ⇨ Centrally located, draining in a brochus
  - ⇨ Content: yellow pus
  - ⇨ Wall:
    - fibrino-suppurative / necrotic-suppurative alveolitis
    - granulation tissue
    - +/- fibrosis

LUNG ABSCESS

- Evolution:
  - scarring
  - cleansing with persistent cavity
  - suppurative pleuritis
  - haemophtysis and bronchiectasias
  - metastatic abscesses

Pulmonary gangrene

Putrefactive decomposition *of lung parenchyma, with progressive tendency to extension into contiguous tissues, induced by anaerobes*

- Elderly subjects and/or with heavily debilitating diseases
- Often secondary to chronic lung lesions
- Restricted / diffuse form

Pulmonary Gangrene

- 1st phase: gangrenous eschar
  - necrotic mass, dry, grey-green
  - haemorragic halo
  - shadows of residual septi
  - central suppurative alveolitis
  - catarrhal marginal alveolitis
- 2nd phase: necrotic break up
  - estensive parenchymal necrosis
  - softening
  - cavities with irregular walls
- 3° phase: cavernous shaping
  - transbronchial elimination of necrotic material
  - bronco-alveolar necrotic residues
  - lack of demarcation
  - sero-fibrinous consensual pleuritis
- Sudden and lethal evolution in septicemia