Pulmonary suppurations

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- Lung abscess
- Necrotizing pneumonia

Lung abscess

- A localized area of necrotic destruction of lung parenchyma in which infection by pyogenic organisms results in tissue necrosis & suppuration

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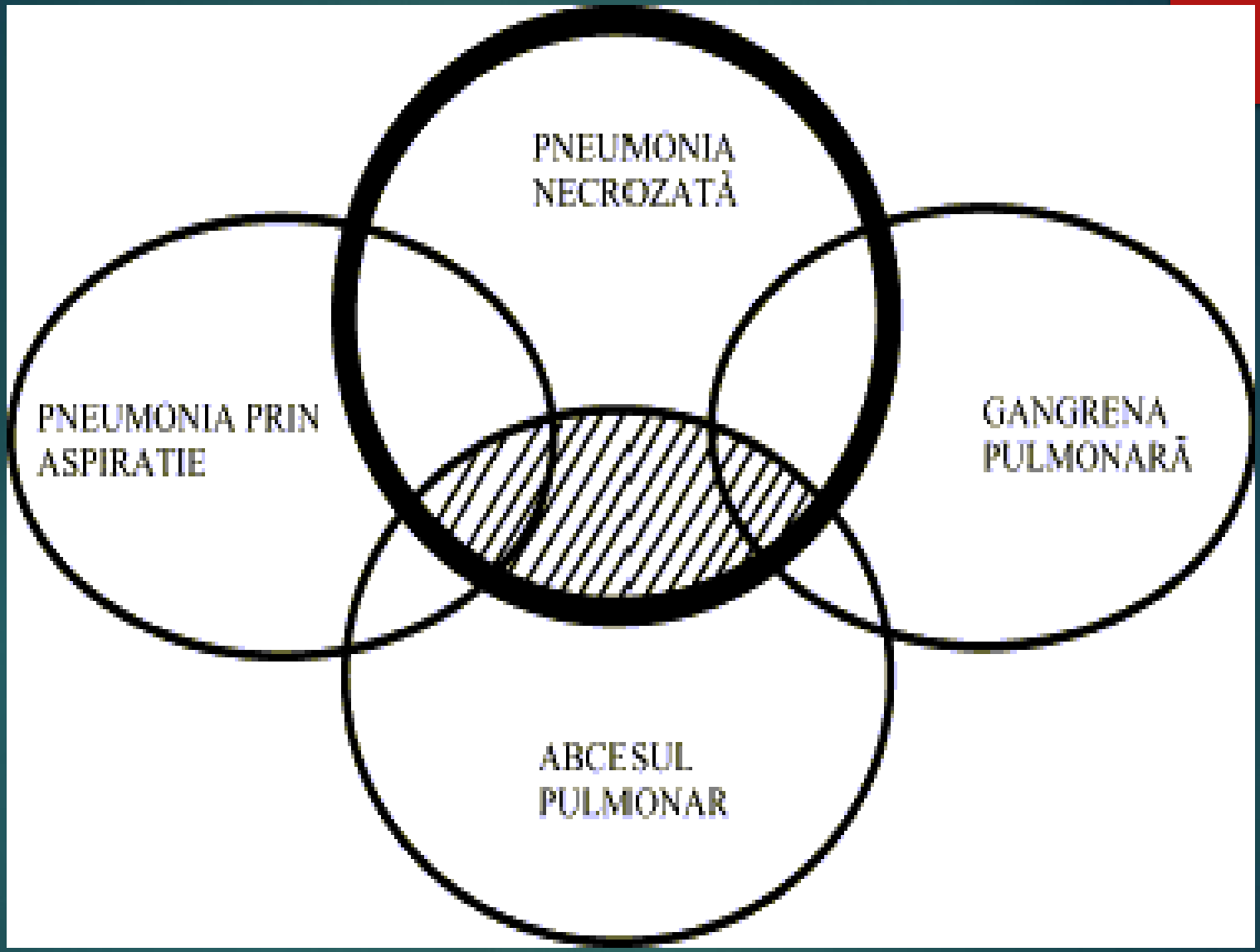
- It manifests radiographically as a cavity with an air – fluid levels

Necrotizing Pneumonia

- necrosis with multiple micro abscesses (less than 2cm in diam)

- The most sever form of necrotizing pneumonia – pulmonary gangrene


PNEUMONIA
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PULMONAR

Ethiology & Pathogenesis

- Microorganism
- Mechanism of infection
- Host defense

Microorganisms

- Caused by a wide variety of different organisms & its common to obtain a mixed bacterial growth from single abscess when pus is cultured

- Anaerobes – 69% of community acquired cases
- Anaerobes – 7% hospital acquired cases

Microorganisms

- Most frequently implicated
- Main groups
- Gram negative bacilli – Bacteroides- Bacteroides fragilis
- Gram positive cocci mainly Peptostreptococcus
- Long & thin gram negative rods – Fusobacterium – Fusobacterium nucleatum, Fusobacterium necrophorum

Microorganisms

- Tend to cause lung abscess as a part of necrotizing pneumonia
- Gram positive aerobes :
- Staph.aureus – pneumonia , lung abscesses , pneumatoceles
- Staph.aureus – leading cause of lung abscess in children
- Strep.pyogenes
- Strep.pneumoniae serotype 3

Microorganisms

- Gram negative aerobes
- Klebsiella pneumoniae
- Pseudomonas aeruginosa
- Hemophilus influenzae
- E.coli
- Acinetobacter
- Proteus
- Legionella

Microorganisms

- Fungal infection – Histoplasma capsulatum
  Blastomyces dermatitidis
  Coccidiodes immitis
  Aspergillus
  Cryptococcus neoformans
  Candida

No Mycobacterium tuberculosis

Mechanisms of Infection

- Commonest cause – Aspiration of oropharyngeal contents
- 75% of the abscesses occur in posterior segment of the Rt. upper lobe or Apical segments of either lower lobe.

Mechanisms of Infection

- Aspiration of Oropharyngeal flora
- Dental / Periodontal sepsis
- Paranasal sinus infection
- Depressed conscious level
- Impaired laryngeal closure (cuffed endotracheal tube, tracheostomy tube, recurrent laryngeal nerve palsy)
- Disturbances of swallowing
- Dealayed gastric emptying / GERD / vomiting

Mechanisms of Infection

- Hematogenous spread from a distal site
- UTI
- Abdominal sepsis
- Pelvic sepsis
- Infective endocarditis
- IV drug abuse
- Infected IV cannulae
- Septic thrombophlebitis

Mechanisms of Infection

- Pre existing lung disease
- Bronchiectasis
- Cystic fibrosis
- Bronchial obstruction : tumour, foreign body, cong.abn
- Infected pulmonary infarct
- Trauma
- Immunodeficiency

Host defense

- **in previously healthy patient or in a patient at risk for aspiration - *primary***
- **Associated with a previous lung condition or immunocompromised status - *secondary***

Clinical Features - Symptoms

- The presenting features of lung suppurations vary considerably .

1. **Symptoms progress over weeks to months**
2. **Fever, cough, and sputum production**
3. **Night sweats, weight loss & anemia**
4. **Hemoptysis, pleurisy**

Clinical Features - Signs

- Therea are no specific signs for lung abscess
- Digital clubbing – develop within a few weeks if treatment is inadequate.
- Increase/decrease vocal fremitus
- Dullness to percussion/Hyperresonance
- Diminished breath sounds if abscess is too large and situated near the surface of lung.
- Amphoric / cavernous breath sounds

Diagnosis

Imaging tests

- **Chest X ray**
- **CT CHEST**

Microbiological tests

Assessment of severity of inflmation (CBC, ESR, CRP, LDH)

Diagnosis

2. **Microbiological exam**
   - **Gram stain: both +ve &-ve, mixed**
   - **Sputum culture on standard & anaerobic culture**
   - **Blood culture**
   - **AFB, Xpert MTB/Rif, MGIT, LJ**

Diagnosis

Uncontaminated specimens

- **BAL**
- **Transtracheal aspirates (TTA)**
- **Transthoracic needle aspirates (TTNA)**

Differential diagnosis

- Cavitating lung cancer
- Localized empyema
- Infected bulla containing a fluid level
- Infected congenital pulmonary lesions
- Pulmonary haematoma
- Cavitated pneumoconiotic lesions
- Hiatus hernia
- Hydatid cysts
- Infection with paragonimus westermani
- Cavitating pulmonary infarcts
- Wegeners granulomatosis

Treatment – antibiotic therapy

1. Penicillin or clindamycin +/- metronidazole IV – in hospitalised pts.
2. Can change – according to sensitivity

Response to treatment

- **Usually show clinical improvement with ↓ fever within *3-4 days* after beginning antibiotics**
- **Should deffervesce in 7-10 days**
- **Persistent fevers beyond this time indicate delayed response, and such patients should undergo further diagnostic tests to define the underlying anatomy and microbiology of the infection**

Duration of treatment

- Debated
- Some advocate 4-6 weeks
- Most treat *until radiographic abnormalities resolve* , generally requiring months of treatment

Surgical intervention

- Surgery rarely required
- **Indications:** failure of medical management, suspected neoplasm, or hemorrhage
- **Predictors of poor response to antibiotic therapy alone:** abscesses associated
- with an obstructed bronchus, large abscess (>6 cm in diameter), relatively resistant organisms, such as P. aeruginosa
- The usual procedure in such cases is a **lobectomy or pneumonectomy**

Treatment

1. **Alternative for patients who are considered with very high operative risks is percutaneous drainage.**

2. **Bronchoscopy- to facilitate drainage (relatively little use)**

Complications

- Empyema
- Bronchopleural –fistula
- Pneumothorax , pyoneumothorax
- Metastatic cerebral abscess
- Sepsis
- Fibrosis, bronchiectasis, amyloidosis