# جامعه سوهاج
# كليه الطب البشري
# قسم جراحه القلب والصدر
# محاضرات الفرقه السادسه – مارس ٢٠٢٠

**By**

**Essam Elbadry (MD)**

# Empyema

by
Essam Elbadry MD.

# Empyema

## Definition :

Empyema thoracis in which there is →

Frank pus in the pleural space

OR

There is evidence of bacterial infection of the pleural fluid by gram stain or a positive culture.

# Empyema

Definitions

A parapneumonic effusion refers to the accumulation of exudative pleural fluid associated with an ipsilateral pneumonia

- **Uncomplicated parapneumonic effusions**, which are exudative, neutrophilic effusion. Gram stain and culture are negative, glucose level greater than 60 mg/dl, pH above 7.20.

- **Complicated parapneumonic effusions**, resulting from a bacterial introduction into the pleura. In this type of parapneumonic effusion, there is a decreased glucose level, pleural fluid is below 7.20. Cultures of fluid from complicated parapneumonic effusions are negative and rapid bacterial clearance from the pleural space, or low bacterial count may explain this. The fluid termed as complicated because it necessitates drainage for resolution.

# Empyema

## Etiology :

- Pneumonia
- complication of cardiothoracic surgery
- Trauma
- blood spread
- From other organs

# Empyema

**Risk Factors**

- age
- diabetes
- etc…..

# Empyema

**Bacteriology**

- *Streptococcus pneumoniae* and *Staphylococcus aureus* are responsible for about 70% of aerobic gram-positive cultures.
- *Klebsiella, Pseudomonas,* and *Haemophilus* species are the commonest in gram-negative culture.
- *Bacteroides* and *Peptostreptococcus* species are the commonest anaerobic organisms.
- In empyema thoracis associated with aspiration pneumonia mixed bacterial florae containing aerobic and anaerobic bacteria are common. The common organism in cases of empyema thoracis complicating surgery is *S. aureus.*

# Empyema

Stages of empyema :

Stage I: acute exudative phase

Stage II : *Fibrinopurulent* phase

Stage III : chronic organizing phase

The clinical course varies from spontaneous healing to chronic empyema and fibro-thorax with trapped restricted lung.

# Empyema

## *Exudative stage*

- Accumulation of fluid in the pleural space due to increased capillary permeability that results from proinflammatory cytokines.
- Clear exudative fluid with a predominance of neutrophils.
- Simple parapneumonic effusion that usually resolves with adequate antibiotic treatment of pneumonia without the need for drainage.
- Takes approximately 2 to 5 days from the onset of pneumonia.

# Empyema

## *Fibrinopurulent stage*

- Develop if adequate treatment is not provided.

- There is a deposition of fibrin clots and fibrin membranes in the pleural cavity, leading to fluid loculations.

- Takes about 5 to 12 days after pneumonia onset.

# Empyema

## *Organizing stage*

- Fibrin membranes are transformed by fibroblast into a thick nonelastic pleural peel, resulting in the trapped lung with restrictive respiratory dysfunction.

- This stage may take about 2 to 3 weeks to develop.

# Empyema

## Presentation

- Common symptoms of bacterial pneumonia with parapneumonic effusion include a cough, expectoration, pleuritic chest pain, and difficulty breathing.
- Fever, tachypnea, and tachycardia
- Pleural effusion (dullness to percussion decreased tactile fremitus and decreased or absent breath sounds)
- Adjacent pneumonia (rales or crackles and/or bronchial breath sounds)

# Empyema

## Investigations

- Plain chest x-ray
- *Chest ultrasound:*
- *Chest computed tomography (CT)*
- Thoracentesis

# Empyema

## Management

- **Antibiotic Therapy**
- **Chest Tube Drainage**
- **Fibrinolytic Agents**
- **Thoracoscopy (VATS)**
- **Decortication**
- **Rib Resection and Open Drainage of Pleural Space**

# Empyema

## Complications

- Residual Pleural Thickening
- Extensive Pleural Fibrosis
- Bronchopleural Fistula Formation
- Empyema Necessitans

# Empyema

Thank you