

### PE (Pulmonary Circulation)

#### Definition

#### Etiology

Arises from thrombi in the systemic venous circulation of the right side of the heart, or from tumors in the venous circulation.

Where do more than 90% of pulmonary emboli originate from?

DVT in lower extremities

#### Virchow's Triad (risk factors)

Venous stasis + endothelial injury + hypercoagulable state (pregnancy, cancer, estrogen OCP, nephrotic syndrome)

#### Clinical features

Tachycardia + tachypnea

#### Gold standard diagnostic test

Spiral CT

#### Treatment

Anticoagulation (heparin, Lovenox, warfarin) for at least 3 months

Buzzwords: Dyspnea after surgery, travel (airplane), LE Fx. May have c/o calf pain also. Lung scan with perfusion defects, venous stasis + vessel wall injury + hypercoagulability

### Pneumoconioses

#### Definition

Chronic fibrotic lung diseases caused by inhalation of coal dust or various inert/inorganic/silicate dusts

#### Clinically important pneumoconioses

Coal workers' pneumoconiosis, silicosis, and asbestosis

#### Clinical Features

Often asymptomatic, can have dyspnea, inspiratory crackles, clubbing, and cyanosis

#### Lab Findings

PGTs show restrictive dysfunction and reduced diffusing capacity. CXR variable.

### Pneumoconioses (cont)

#### Treatment

Supportive (no effective tx available): O<sub>2</sub>, vaccines, rehab

### Foreign Body Aspiration

#### Definition

Aspiration of gastric contents, inert material, toxic material, or poorly-chewed food. Know Heimlich maneuver!

#### Clinical Features

Choking, coughing, unexplained wheezing or hemoptysis

#### Possible Sequelae

Asphyxia, PNA (aspiration pneumonia),

What is one of the most common causes of ARDS?

Acute gastric aspiration

#### Lab Studies

Expiratory radiography may show regional hyperinflation caused by a check valve effect

#### Treatment

Bronchoscopy for diagnosis and removal/treatment. Cultures should be obtained if post-obstructive PNA suspected

### Pulmonary HTN (Pulmonary Circulation)

#### Definition

Present when the pulmonary arterial pressure rises to a level inappropriate for a given cardiac output; self-perpetuation once present

#### Primary (idiopathic) pulmonary HTN

Rare + fatal

#### Secondary pulmonary HTN

Many causes that develop as a result from obliteration and obstruction of the pulmonary arterial tree

#### Hypoxia

Most important/potent stimulus of pulmonary arterial vasoconstriction (others are acidosis and veno-occlusive diseases)

### Pulmonary HTN (Pulmonary Circulation) (cont)

#### Clinical features

Dyspnea, angina-like pain, weakness, fatigue, edema, ascites, cyanosis, syncope

#### Signs on physical exam

Narrow splitting and accentuation of the 2nd heart sound, systolic ejection click

#### Treatment

Chronic oral anticoagulants, CCB to lower systemic arterial pressure, and prostacyclin (a potent pulmonary vasodilator), and heart-lung transplant

### ARDS (Acute adult respiratory distress syndrome)

#### Definition

Increased permeability of the alveolar capillary membranes --> leads to pulmonary edema and widespread inflammation

3 Clinical Settings that account for 75% of ARDS cases

*Sepsis syndrome* + severe multiple trauma + aspiration of gastric contents

#### Clinical Features

Rapid onset of dyspnea 12-24 hrs after the precipitating event, PE shows tachycardia, frothy pink/red sputum, diffuse crackles. Many pts are cyanotic with increasingly severe hypoxemia that is refractory to administered O<sub>2</sub>

#### Lab Findings

CXR shows peripheral infiltrates with air bronchograms, spares costophrenic angle, can get multi-organ failure

#### Treatment

Treat underlying precipitating problems, supportive care (O<sub>2</sub>, PEEP), high mortality rate. 33% of deaths occur within 3 days of ARDS sx onset



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### Sarcoidosis

#### Definition

Multiorgan disease involving abnormal collections of inflammatory cells (granulomas), most often in the lungs

#### Classic Patient

Higher incidence in North American black women, and northern European whites

#### Clinical features

Respiratory sx (cough, dyspnea of insidious onset, chest discomfort)

#### Other extrapulmonary signs/sx

Malaise, fever, erythema nodosum or enlargement of parotid glands/lymph nodes/spleen/liver

#### Lab Findings

ACE levels elevated, CXR shows bilateral hilar and right paratracheal adenopathy and bilateral diffuse reticular infiltrates

#### How to confirm diagnosis

Transbronchial biopsy of the lung or fine-needle node biopsy --> will show non-caseating granulomas

#### Treatment

Corticosteroids at maintenance doses

### Idiopathic Fibrosing Interstitial Pneumonia

#### General

Most common dx among pts with interstitial lung disease.

#### Three histopathologic patterns w/ different natural histories and treatments

Usual interstitial PNA, respiratory bronchiolitis-associated interstitial lung disease, and acute interstitial pneumonitis

#### Clinical Features

Insidious dry cough, exertional dyspnea, constitutional sx. Exam might show clubbing and inspiratory crackles.

### Idiopathic Fibrosing Interstitial Pneumonia (cont)

#### Lab Findings

CXR shows fibrosis, CT shows fibrosis + pleural honeycombing, PFTs show restrictive pattern (decreased lung volume with a normal to increased FEV1/FVC ratio)

#### Treatment

Controversial--none has been showed to improve survival or QOL

### Hyaline Membrane Disease

#### Definition

Developmental insufficiency of surfactant production and structural insufficiency in lungs. Most common cause of respiratory disease in preterm infant

#### Etiology

Deficiency of surfactant

#### Clinical Features

Signs of respiratory distress

#### Lab Findings

CXR shows air bronchograms, diffuse bilateral atelectasis causing a *ground glass* appearance, doming of the diaphragm

#### Treatment

Synchronized intermittent mandatory ventilation. (Can also give exogenous surfactant in delivery room for prophylaxis)



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