

# COPD - Chronic Obstructive Pulmonary Disease

## Acute Inflammatory Response

### Chemical Mediators

- Histamine
- Prostaglandins
- Leukotrienes
- Bradykinin

### Vascular Response

- ↑ Vasodilation
- ↑ hydrostatic pressure
- ↓ intravascular osmotic pressure
- ↑ capillary membrane permeability



- slowed circulation
- neutrophils move to capillary walls

## Gas Exchange Abnormalities

Hypoxia

Clubbing of fingers

- Polycythemia
- V/Q from chronic hypoxemia / hypercapnia
- resistance ↑ PVR

not enough O<sub>2</sub> in & CO<sub>2</sub> out

## Initiating event

- Smoking (95% of all causes)
- Alpha Antitrypsin deficiency

## Mucus Hypersecretion

↑ mucus production

## Airflow Limitation

### Branchitis

- inflammatory response in airways
- ↑ mucus production
- Broncho constriction
- Cellular adaptation
- Airway fibrosis

## Pulmonary Hyperinflation

- loss of elastic tissue
- alveolar destruction
- ↓ recoil
- barrel chest (emphysema)
- ↓ surface area
- ↑ CO<sub>2</sub>
- loss of radial traction

### Emphysema

- loss of elastic recoil
- loss of radial retraction

## Cellular Adaptation

- Hyperplasia of goblet cells
- Hypertrophy & hyperplasia of submucosal glands in large bronchi (narrow airway)
- Metaplasia (ciliary epithelial cells) → stratified squamous

## Ciliary Dysfunction

- destruction of cilia
- metaplasia → impaired mucociliary clearance mechanism
- ↓ function of mucociliary escalator

## Cor Pulmonale

- ↑ afterload
- ↑ workload
- RV hypertrophy
- R sided heart failure
- V/Q

## Pulmonary Hypertension

- late in course of the disease
- R side of heart
- ↑ workload

compensatory vasoconstriction/dilation