

Respiratory Block

PATHOLOGY TEAM 430

1st Lecture

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■ NORMAL ANATOMY :

The air conducting passages consist of the nasal cavities, paranasal sinuses, nasopharynx, oropharynx, hypopharynx (epiglottis and larynx), and tracheobronchial tree. At the carina, the trachea branches into the mainstem bronchi which branch into lobar bronchi which branch into segmental bronchi which supply the intralobar bronchopulmonary segments. Further branching produces subsegmental bronchi, bronchioles, terminal bronchioles, respiratory bronchioles, alveolar ducts and alveolar sacs. The pulmonary arteries follow the airways while the pulmonary veins run through the connective tissue septa. Lymphatic channels are present along the bronchovascular structures but are also found in the pleura and connective tissue septa.

- There are two main differences between Bronchioles and bronchi:
 - Bronchioles don't have cartilage
 - Bronchioles don't have submucosal glands and don't have goblet cells

.....

■ Histology :

With the exception of the oropharynx and portions of the nasopharynx and hypopharynx (which are lined by squamous epithelium), the upper respiratory tract and the large airways are lined by pseudostratified ciliated columnar epithelium interspersed with mucus-secreting goblet cells الخلايا الكأسية and neuroendocrine cells each of those cells give rise to cancer and change in the disease, it is also present in the GIT . Mucus-secreting glands lie beneath the epithelial surface and the cartilaginous plates help to maintain patency. Cartilage, submucosal glands and goblet cells are lost at the level of the bronchioles which are lined by ciliated . cuboidal epithelium and Clara cells (which secrete a non-mucoid watery substance that contains lysozyme and immunoglobulins), and it has got a tumor termed by bronchioloalveolocarcoma . The majority of the alveolar surface is lined by the Type I pneumocytes which are interspersed with the surfactant-

Terminal bronchiol + respiratory bronchiol + alveolar duct + alveoli

all of them called acinus

يعني من التيرمينال برونكيول وأنت نازل هؤلاء جميعهم يقال عنهم أسيني أو أسينوس والفنكيشن تبع اللق يصير في الأسيني هذه

producing Type II (cuboidal/ granular) pneumocytes. The interstitium contains collagen! elastin! mast cells! occasional inflammatory cells and connective tissue cells (primarily smooth muscle and fibroblasts). Alveolar macrophages that are derived from blood monocytes are loosely attached to the alveolar wall or lie free within the alveolar space.

ملاحظة مهمة التايب ١ : فلاتين سيلز

أما الكلارا سيلز والتايب ٢ : شكلهم مكعب كوبيدال

Always the pathology rising on the type 1 and the damage and destruction occur on it, while the type 2 yesser laha hyperplasia

وهذه الخلايا جالسة على basement membrane, within this basement membrane

there is a pores called pores of kohn

■ CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) :

A] General considerations

- (1) COPD is a group of disorders characterized by airflow obstruction.

الأقنية Always narrowing in the airways

- (2) Characteristics include a marked decrease in the forced expiratory volume (FEV1).
- (3) COPD is often contrasted مغايرة ومتباينة with restrictive pulmonary disease!, also called interstitial lung diseases and the disease is not in the duct or airways it is in the interstitium a group of disorders characterized by reduced lung capacity due either to chest wall or skeletal abnormalities such as kyphoscoliosis or to interstitial and infiltrative parenchymal fibrotic disease. Mean compliant here is the dyspnea

What are the symptoms of respiratory disease ?

there are 2 types : productive and nonproductive, productive cough gives **يسعل** Cough , nonproductive is a dry cough **قشع** sputum

Difficulty in breathing = **dyspnea** ؟؟ **ويكون سيمبтомز للأزمة ولأي سي أو بي دي بشكل عام**

Wheezing, comes from bronchiol trees

If the patient complains discomfort or pain in the chest you should make sure he doesn't have ischemic heart disease **لذلك الطب يحتاج خمس سنوات ولا الموضوع كان يومين أو ثلاثة**

■ Pathologic Findings in Chronic Obstructive Pulmonary Disease

| Name of Disorders | Pathologic findings |
|--|---|
| Bronchial asthma | Bronchial smooth muscle hypertrophy. Hyperplasia of bronchial submucosal glands and goblet cells. Airways plugged by viscid mucus containing Curschmann spirals , eosinophils and Charcot-leyden crystals . |
| Chronic bronchitis | Hyperplasia of bronchial submucosal glands leading to increased Reid index: ratio of the thickness of the gland layer to that of the bronchial wall. |
| Pulmonary, emphysema | Abnormal dilation of air spaces with destruction of alveolar walls. Reduced lung elasticity. |
| Bronchiectasis توسع وتركد القصبات | Abnormally dilated bronchi which are filled with mucus and neutrophils. Inflammation and necrosis of bronchial walls and alveolar fibrosis. |

■ Bronchial Asthma

it is an **episodic, reversible** bronchoconstriction due to an abnormal respond to various stimuli. It has nothing to do with alveolar duct or alveoli,,,

1) Types include **extrinsic** and **intrinsic** asthma :

a) Extrinsic , atopic , allergic 70% (immune) asthma is mediated **by a type I hypersensitivity** response involving **IgE** bound to mast cells. The disease begins in childhood and usually in patients with a family history of allergy.

b) Intrinsic (non-immune) asthma includes asthma associated with **chronic bronchitis** as well as other asthma variants such **as exercise- or cold-induced asthma**. It usually begins in adult life and is not associated with a history of allergy. Or people they take some drugs like aspirin

2) Clinical presentation.

There is marked episodic dyspnea and wheezing expiration caused by narrowing of the airways. Bronchial asthma is related to increased sensitivity of air passages to stimuli which leads to spasm in the bronchial muscular wall.

3) Pathological changes.

Morphologic manifestations include bronchial **smooth muscle hypertrophy, hyperplasia of goblet cells, thickening and** hyalinization **of basement membranes**, proliferation of eosinophils its increase caused by IL-5 and intrabronchial **mucous plugs** , mucous secretions caused by IL-13 with whorl-like accumulations of epithelial cells **(Curschmann spirals)**

عبارة عن ميوكس بلوقز مخلوط مع ديجينيريتف إبيثيليال سيلز خيط من الإبيثيليال في النص ويطلع في السبيوتم أناليسيس إذا طلع بوزيتيف يعني إنه عنده أزمة

and crystalloids of eosinophil-derived proteins **(Charcot-Leyden crystals)**

وهو تبلور للبيسيك بروتينز.

Complications : include **superimposed infection**, chronic bronchitis, and pulmonary **emphysema**. Bronchial asthma may also lead to **status asthmaticus** which is a prolonged bout of bronchial asthma that can last for days and responds poorly to therapy, **and it is not reversible and it leads to pulmonary acidosis** CO₂ accumulation and may cause **chore pulmonary right heart ventricle failure**. Death can result from status asthmatics.

أحيانا يكون معه سعال وكحة

باختصار السيمبتومز :

1- ويزينق

2- ديسبنيا

3- Reduced FEV1

Good Luck