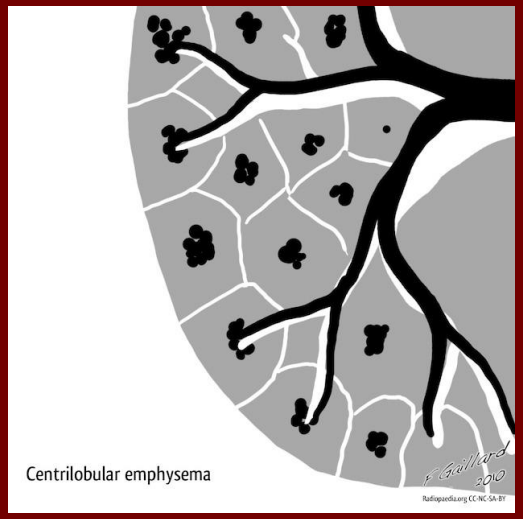
Types


Centrilobular emphysema
F. Gaillard 2010
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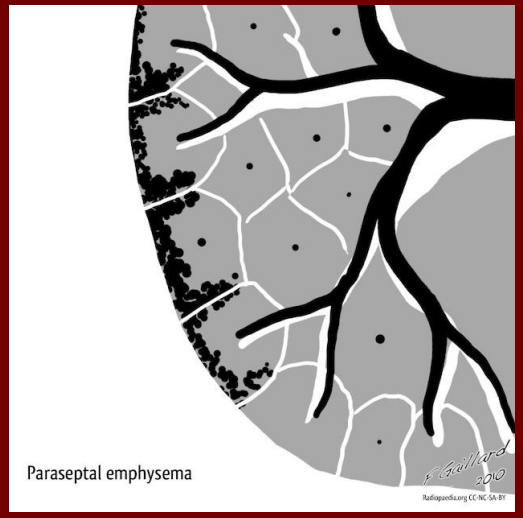
Paraseptal emphysema
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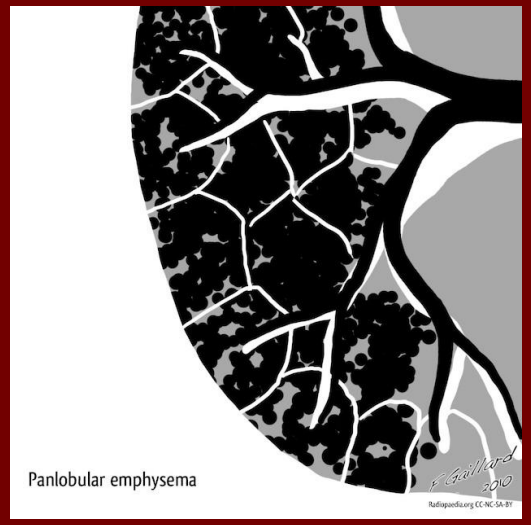
Panlobular emphysema
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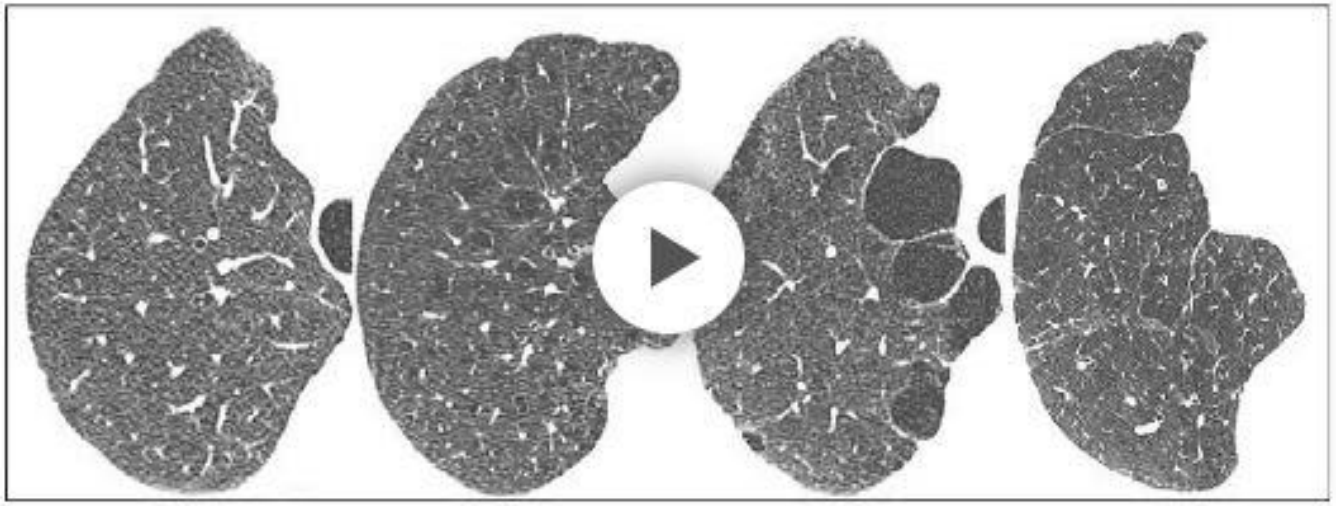
Subtypes of Emphysema



Absence of emphysema | Centrilobular emphysema | Pataseptal emphysema | Panlobular emphysema

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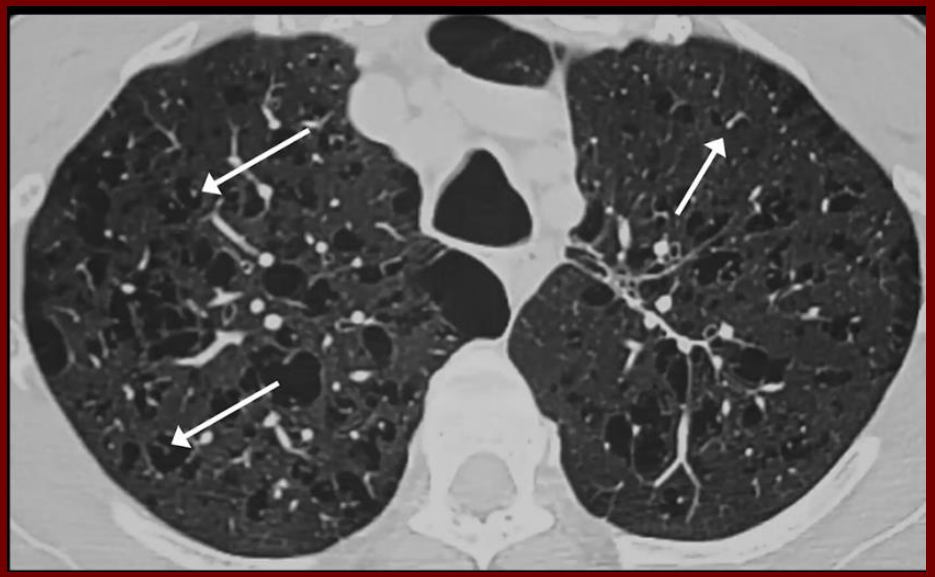
Centrilobular Emphysema

- Centrilobular emphysema (CLE)
- Synonyms
  - Centriacinar emphysema
  - Proximal acinar emphysema
- Destruction and enlargement of respiratory bronchioles near center of secondary pulmonary lobule.
- Precursor may be respiratory bronchiolitis

Centrilobular Emphysema

- Structures in middle of cyst. Helps to differentiate
- Centrilobular low attenuation, no discernible wall
- May visualize central lobular artery surrounded by destroyed lung (**central dot sign**)
- **Upper lung zone predominant**
  - Lung apices, lower lobe superior segments



Paraseptal emphysema (PSE)

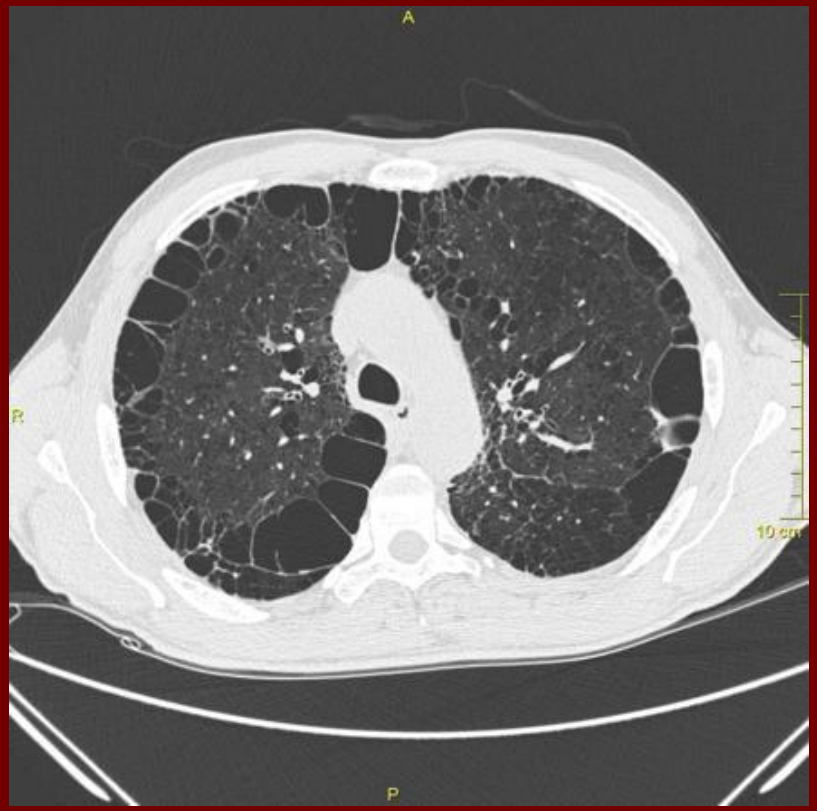
- Destruction located in lung periphery adjacent to pleura or along interlobular septa
- Permanently enlarged distal airspaces with destruction
- Bulla: Dilated airspace measuring > 1 cm
  - Bullae: Circumscribed, thin-walled, coalescent destroyed acini
- **Vanishing lung syndrome**: Severe PSE and large bullae (> 1/3 of hemithorax) compression of adjacent lung

Etiology

- Pathogenesis unclear
- Association with tall and thin body habitus
- Postulated mechanism: ↑ gravitational pull on lungs with greater negative pleural pressure at lung apices
- Associated with Marfan and Ehlers-Danlos syndromes
- ↑ incidence in smokers, IV drug users, HIV(+) patients
- Marijuana cigarettes may be more highly associated
- Often coexists with centrilobular emphysema

Paraseptal emphysema

- Acute dyspnea and chest pain with spontaneous pneumothorax
- Demographics
  - Classically occurs in male smokers; 4th decade

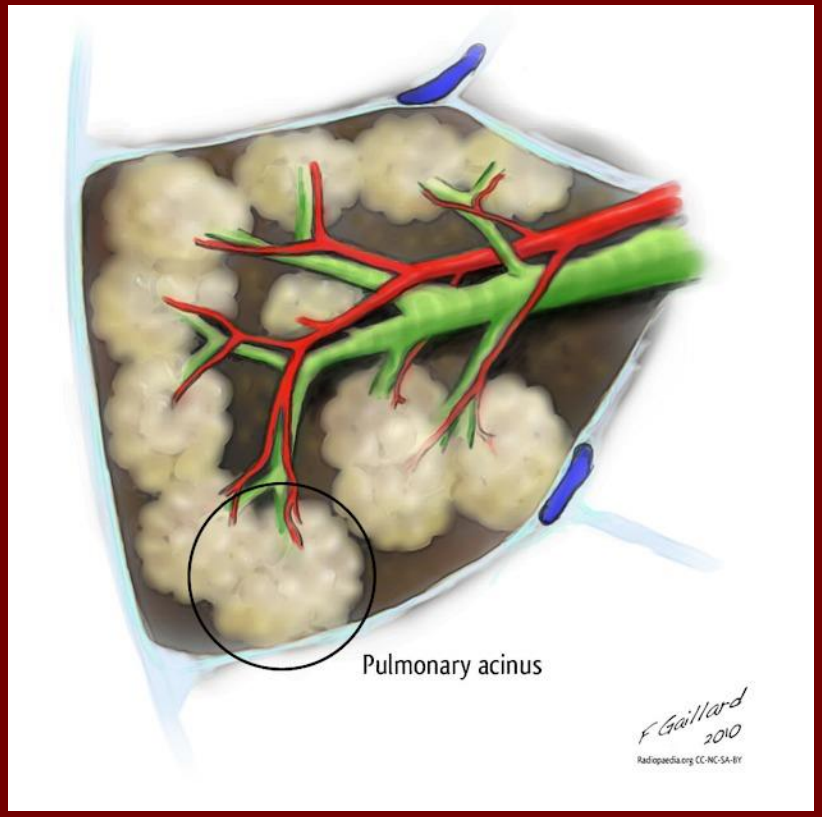


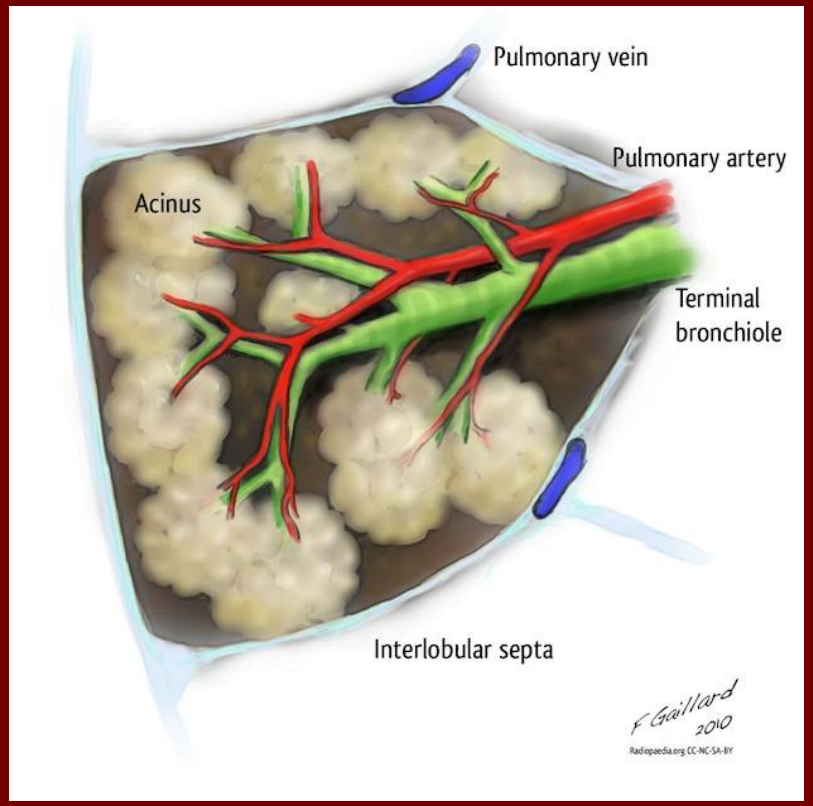
Panlobular Emphysema

- Enlargement and destruction of entire acinus or secondary pulmonary lobule.
- α-1-antitrypsin deficiency (α1AD)
- Destruction of entire acinus
- Idiopathic PLE does occur; 5-10% of random autopsies
- Less common causes
  - Intravenous methylphenidate abuse ("Ritalin lung")
  - Elastin abnormalities: Ehlers-Danlos, cutis laxa

Secondary pulmonary lobule

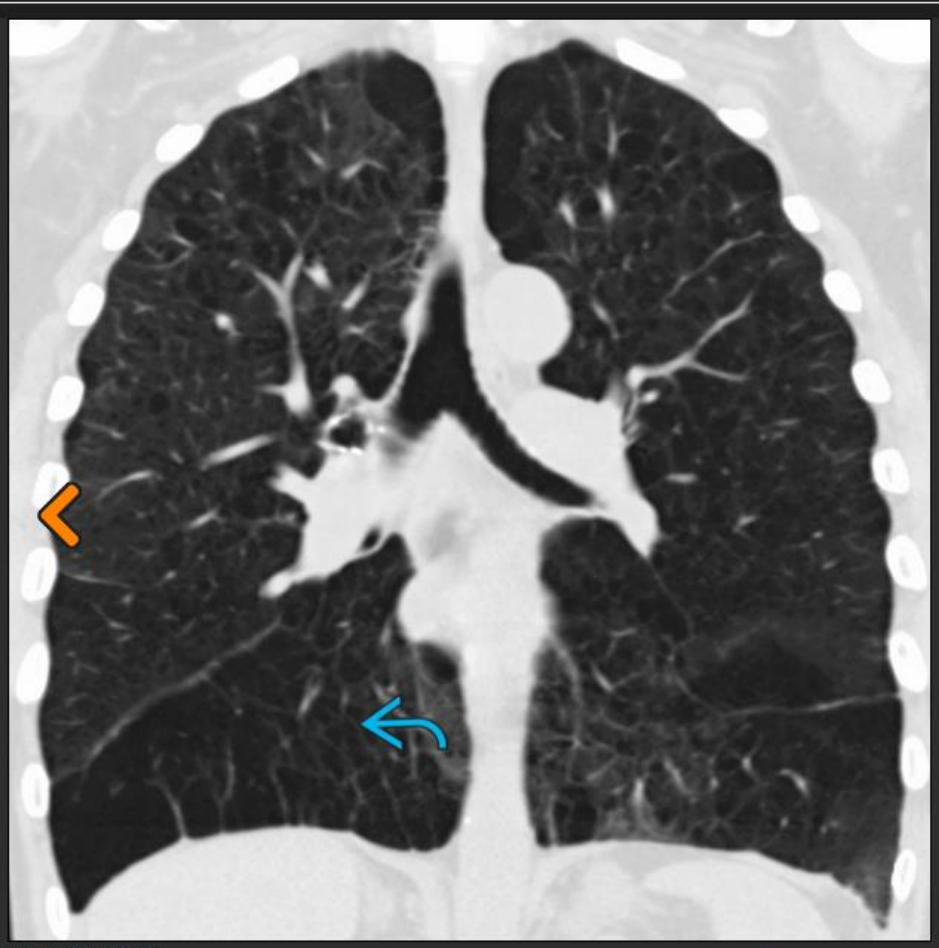
also known as the **pulmonary lobule**





CT

- Consider PLE in patients with diffuse homogeneous decreased lung attenuation on CT/HRCT
- **Diffuse regions of lucency** with paucity of vessels in affected areas
- Difficult to distinguish between normal lung and PLE
- Bronchiectasis
- Concurrent centrilobular or paraseptal emphysema may occur, particularly in α1AD patients who smoke



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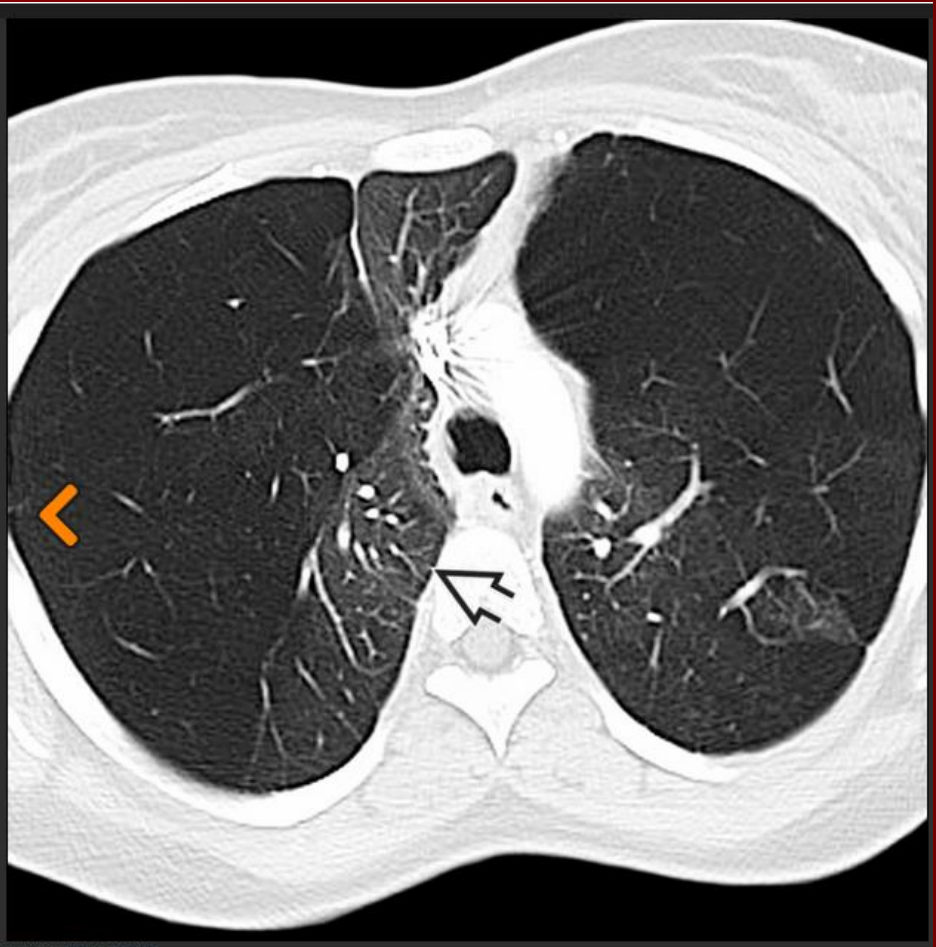
Coronal NECT of the same patient shows the lower lung predominant, diffuse low attenuation of the lung with paucity of small-caliber intrinsic vascular structures. This patient was found to be a heterozygote carrier of the α-1-antitrypsin deficiency gene. Lung destruction was compounded by the patient's cigarette smoking.



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Axial CECT of the same patient shows diffuse low attenuation bilaterally with associated paucity of vascular structures and scattered areas of normal lung. Given these imaging findings, the patient was tested for and diagnosed with α-1-antitrypsin deficiency.

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