肺部感染症及呼吸道疾病之影像判讀

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1.肺部感染症: 肺炎

- 影像上分類:

1.Alveolar pattern

2.Interstitial pattern

Lung Radiology Pattern Recognition

Is Pattern Recognition the best system?

- Fail to consider normal vs. abnormal
- Few diseases involve one compartment
- Can’t make diagnosis from radiograph
- For beginners (and maybe intermediates), too confusing
- Confession…even radiologists argue about patterns

Alveolar pattern

- An alveolar pattern is defined by the existence of more or less broad portions of the lung more opaque than normal due to partial or complete alveolar filling.
- With a few exceptions, the pulmonary architecture is overall preserved, and, if signs of interstitial involvement are present, they are not prevalent.
- On HRCT the different opacity of the alveolar pattern reminds the variable density of the clouds.

- In alveolar diseases, this pattern is predominant; however, there are other diseases in which alveolar opacities may be found, albeit less important or sporadic.

- The HRCT key signs are:
- • Ground-glass opacity
- • Consolidation

Ground glass opacity

- 病理：肺泡內襯或間質內的空間充斥其他的液體或固體，但未完全佔領，仍留有部分空氣。(interstitial or/& alveolar sac coating, but not full filled)
- 1. 通常表示疾病源自間質，透過bronchial trees間質傳播；但是當GGO繼續惡化也可變成consolidation。
- 2. 影像學：病灶內的lung markings仍清析可見。

Consolidation

- 病理：肺泡內襯或間質內的空間充斥其他的 液體或固體，而且幾乎完全填滿，肺泡內幾乎已無空氣，僅小支氣管內留有部分空間，形成所謂的air-bronchogram。
- 1. 通常表示疾病源自肺泡，透過肺泡間通道傳播，但是傳至肋膜即止。也可以兩個以上肺葉同時發病
- 2. 影像學：病灶內已無法辨識lung markings，但是有時反而容易顯出air-bronchogram。

Interstitial pattern

- An interstitial lung pattern is a regular descriptive term used when reporting a plain chest radiograph.
- It is the result of the age-old attempt to make the distinction between an interstitial and airspace (alveolar) process to narrow the differential diagnosis.

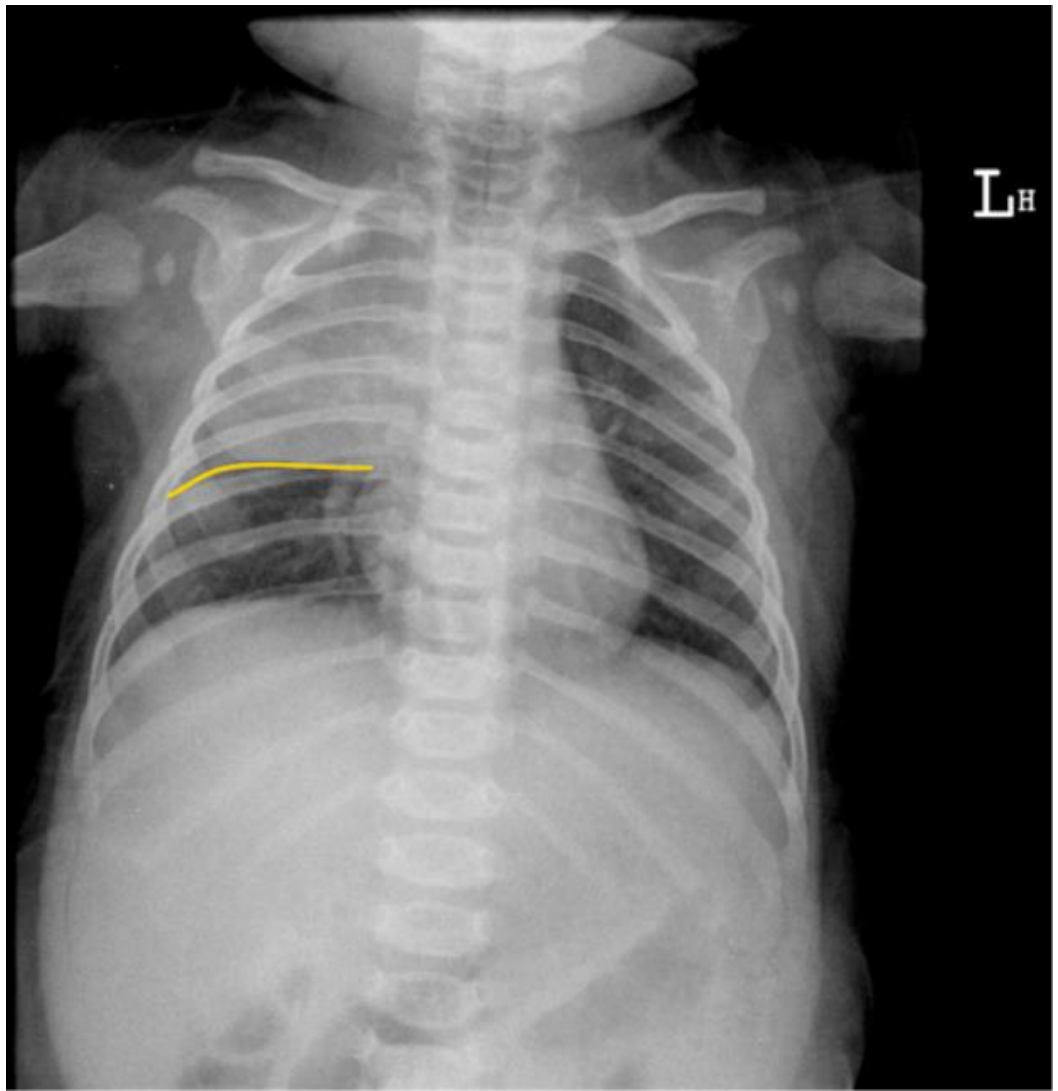
- A re-read of the timeless work of Benjamin Felson in 1979, "A new look at pattern recognition of diffuse pulmonary disease" , explains the difficulty of describing a disease process as purely interstitial.
- The problem is that despite processes starting in the pulmonary interstitium, by the time they appear on a radiograph, there is almost certainly a degree of airspace involvement.

- lymphangitic carcinomatosis: while the process creates a linear pattern, by the time it is recognisable on a radiograph, "at autopsy the spreading neoplasm usually appears to have cut a tornado-like path through all compartments of the pulmonary tissue"
- viral pneumonias: while these are widely considered to be interstitial, chickenpox pneumonia is a predominantly alveolar process with airspace opacification on the chest radiograph
- pneumocystis pneumonia starts as an interstitial process, but by the time the radiograph is taken, histological examination demonstrates extensive alveolar involvement

- The importance here is to reduce the confusion that arises when trying to be dogmatic about separating pathology into interstitial or airspace pathology.
- Take the example of a cavity - it could arise from airspace or interstitial disease:

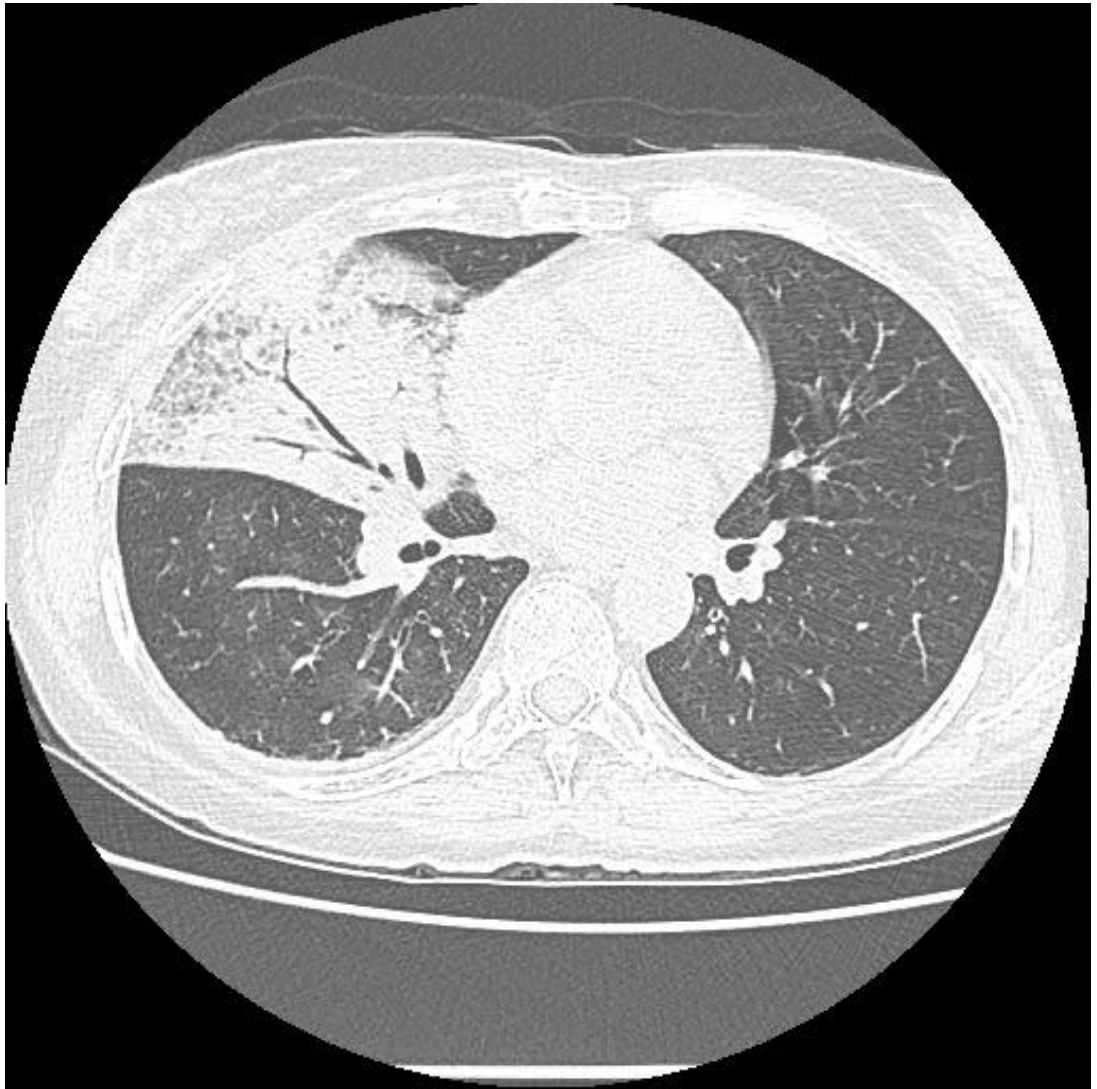
- cavitating pneumonia occurs as a result of airspace pathology but it is unreasonable to say that the interstitium is not involved
- cavitation of a tuberculous nodule - the nodule is initially interstitial, but with growth involves the airspaces, and as it enlarges, cavitation occurs

1.1 Invasive Pneumococcus Disease (IPD) Lobar Pneumonia

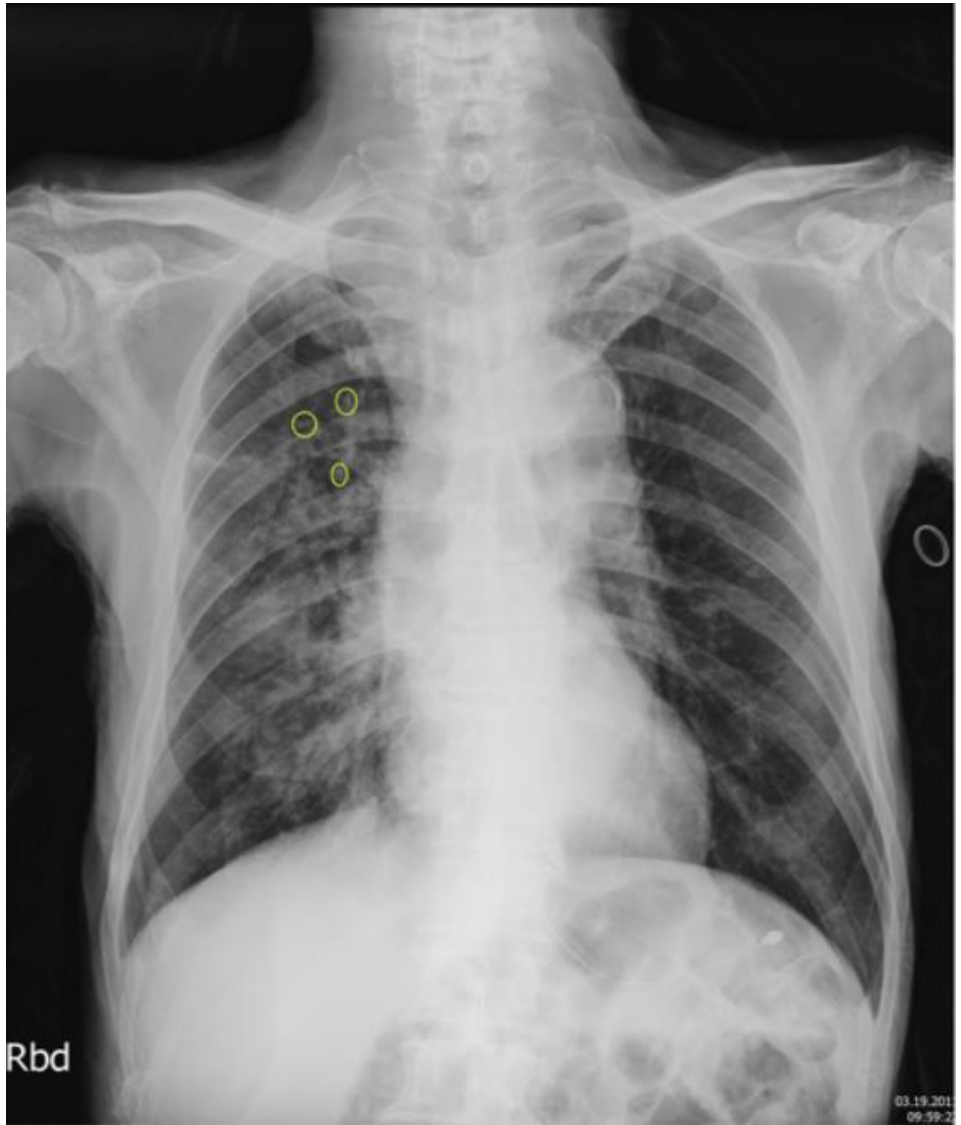


1.2 RML pneumonia

RML Pneumonia



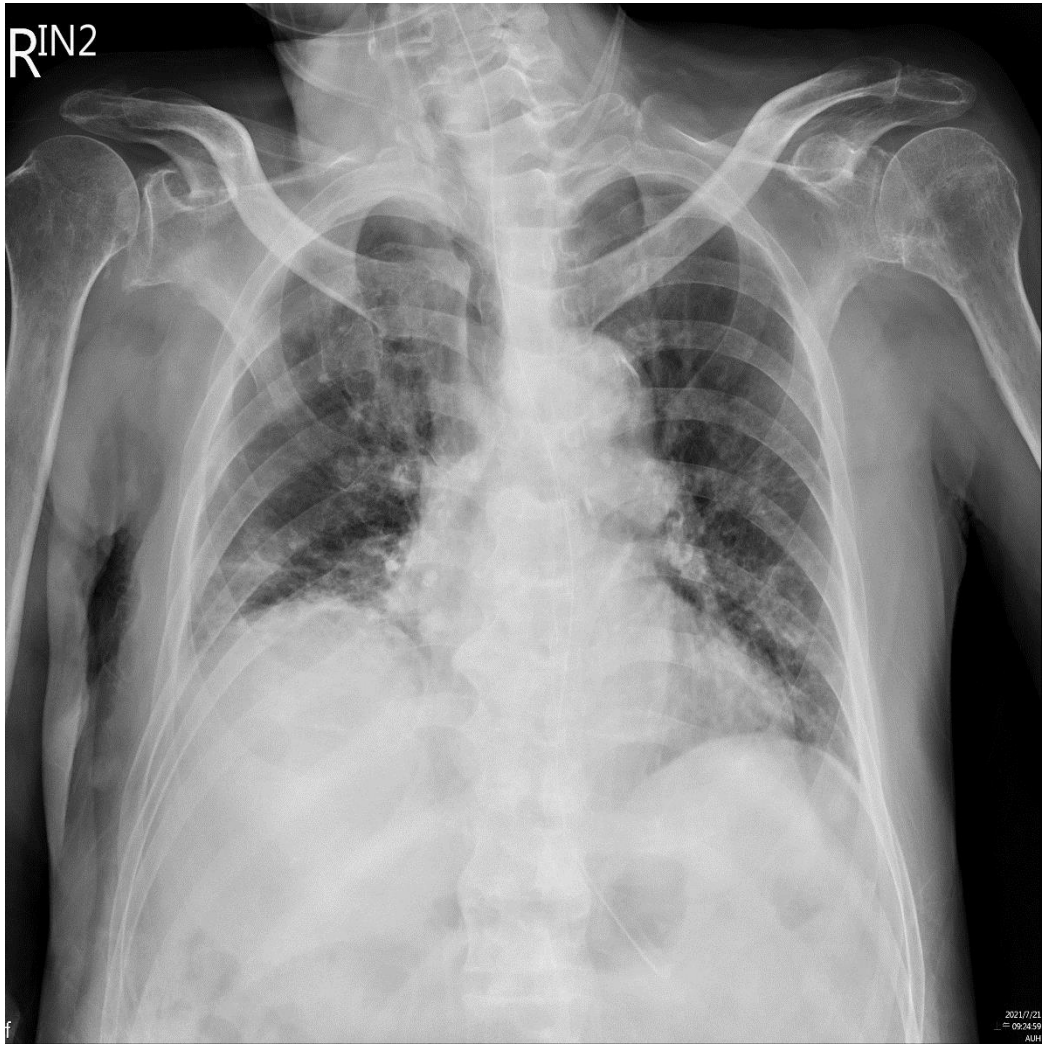
1.3 Bronchopneumonia(Mycoplasma)

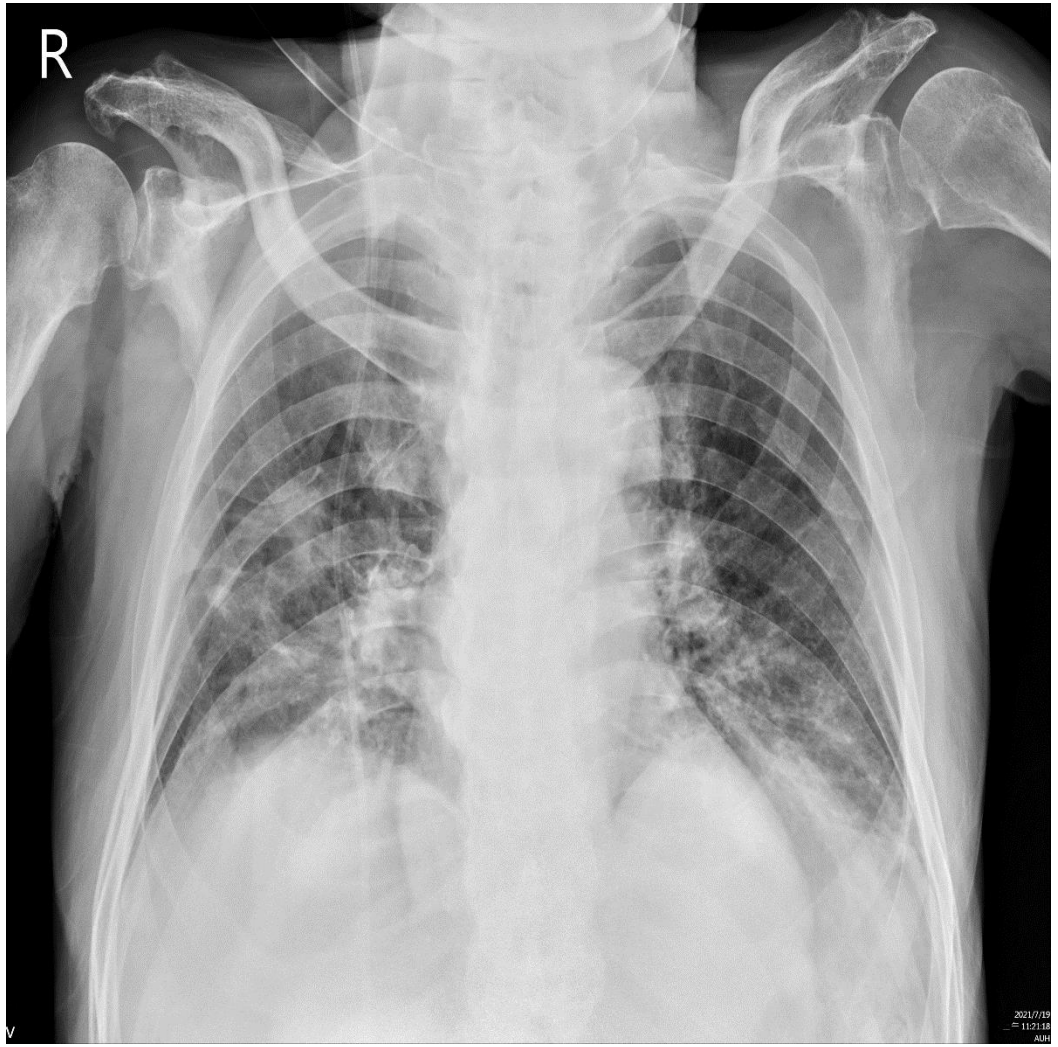


1.4 Mycoplasma Pneumonia(Alveolar pattern)

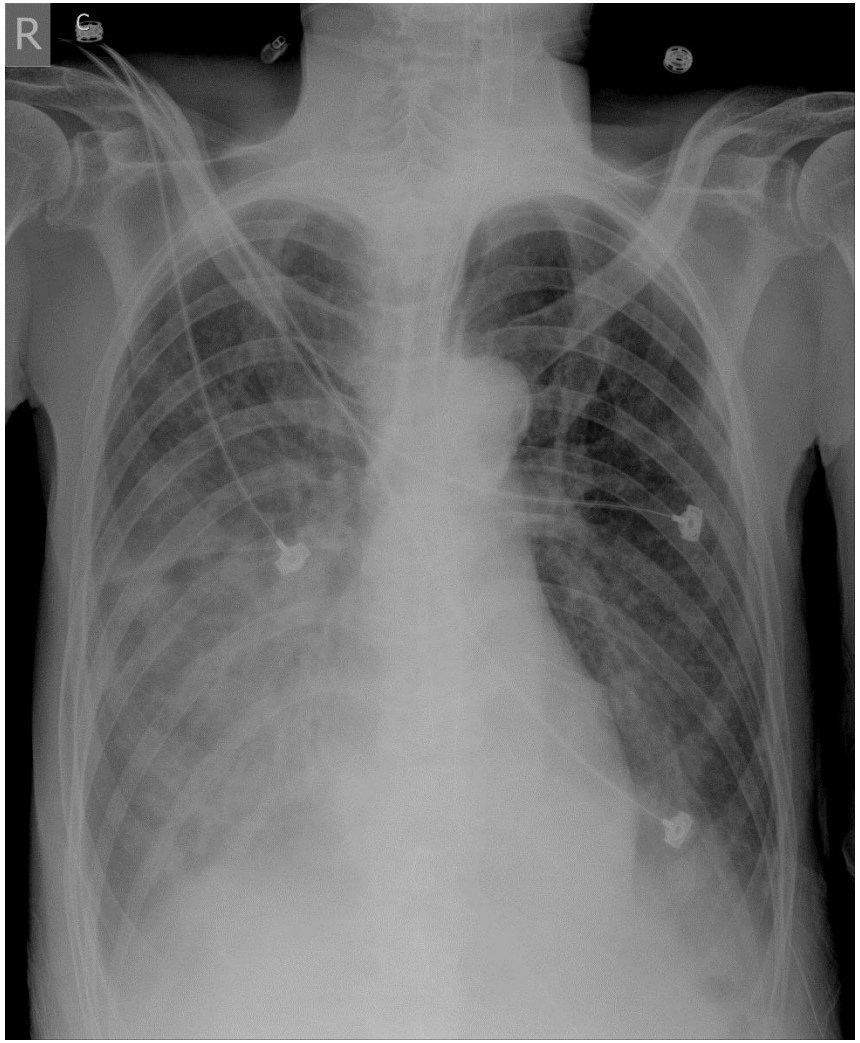
1.5 Scrub typhus

1.6 Aspiration Pneumonia(pneumonitis)

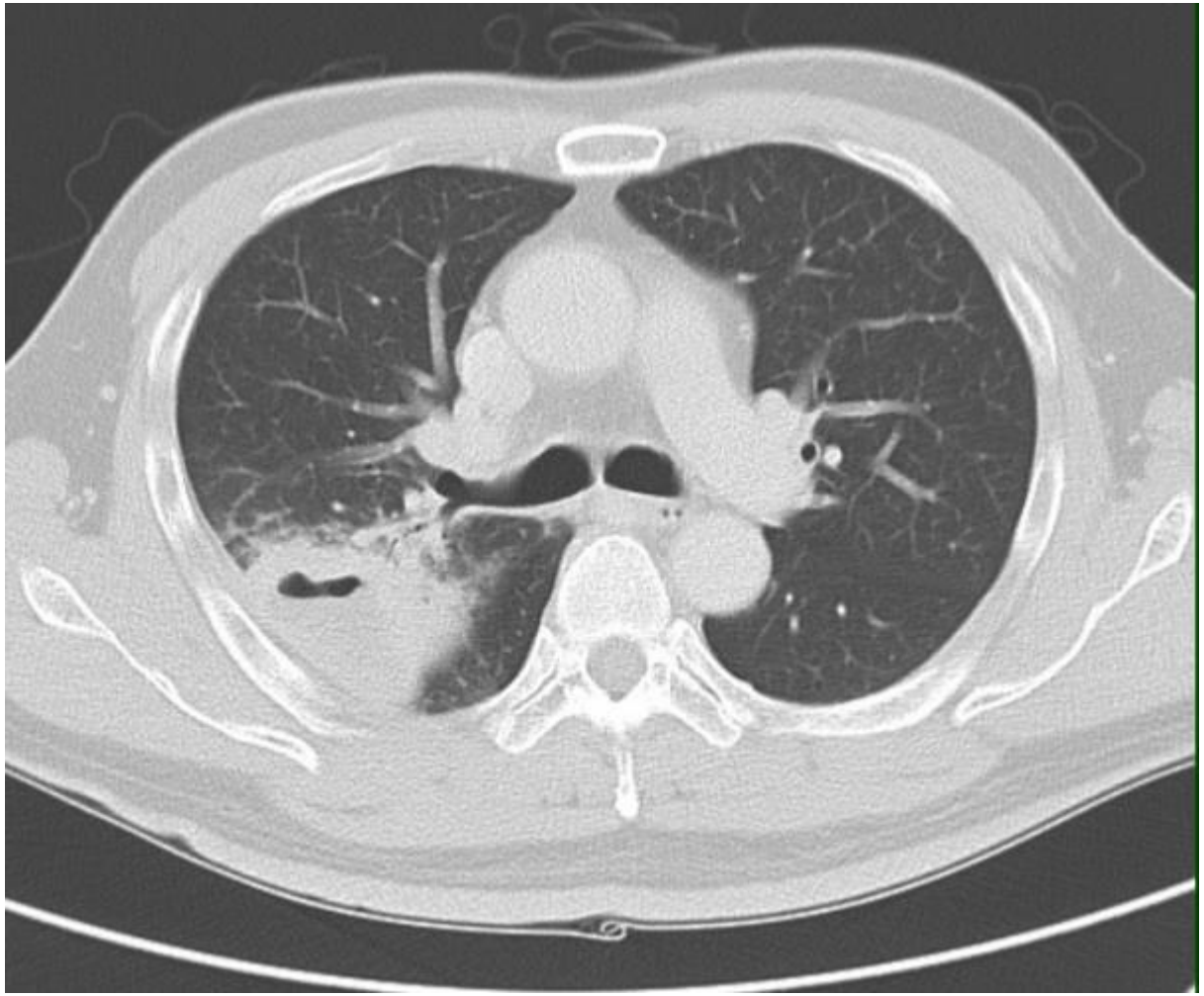


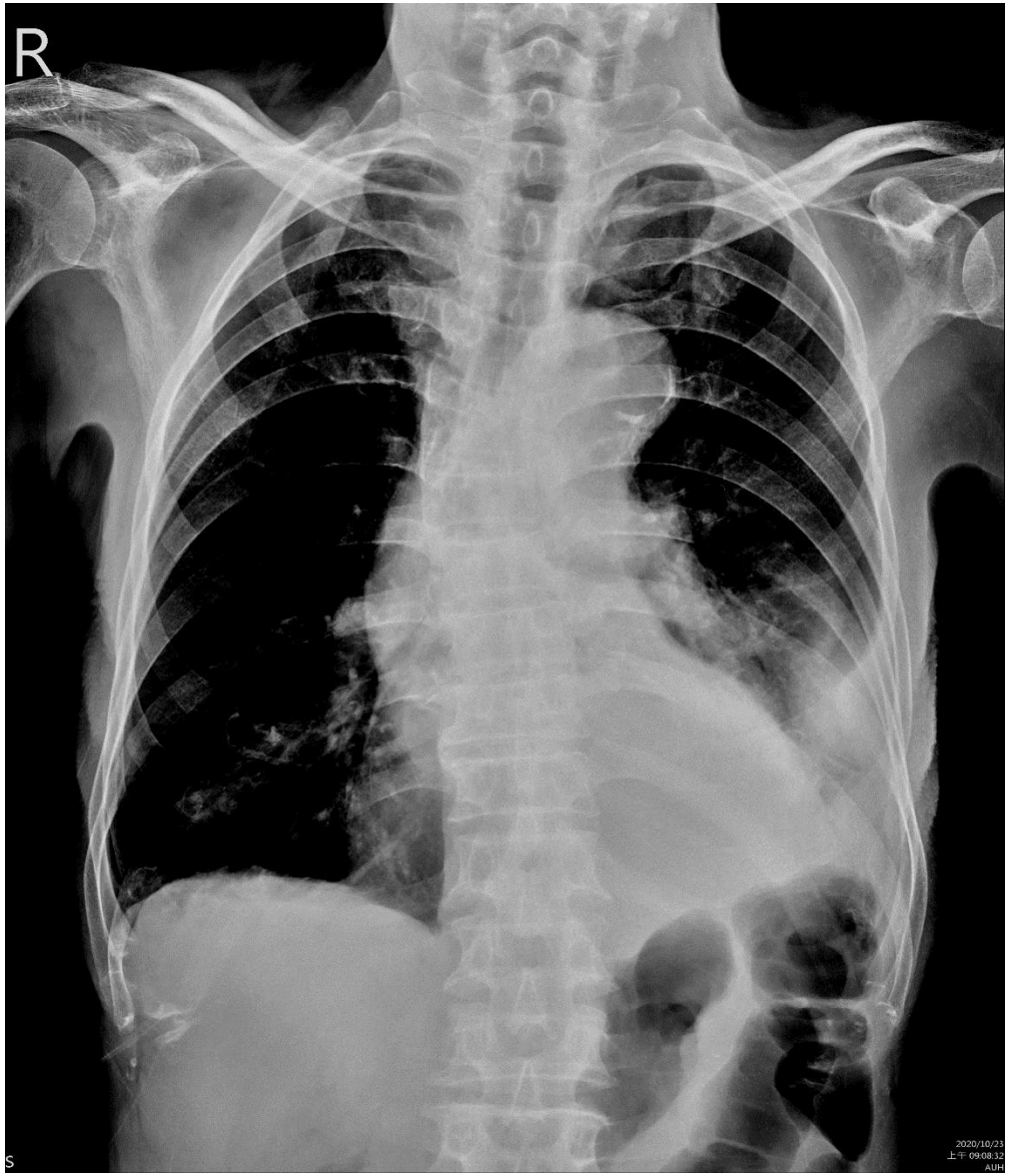


1.7 Massive Aspiration Pneumonitis



1.8 Lung Abscess

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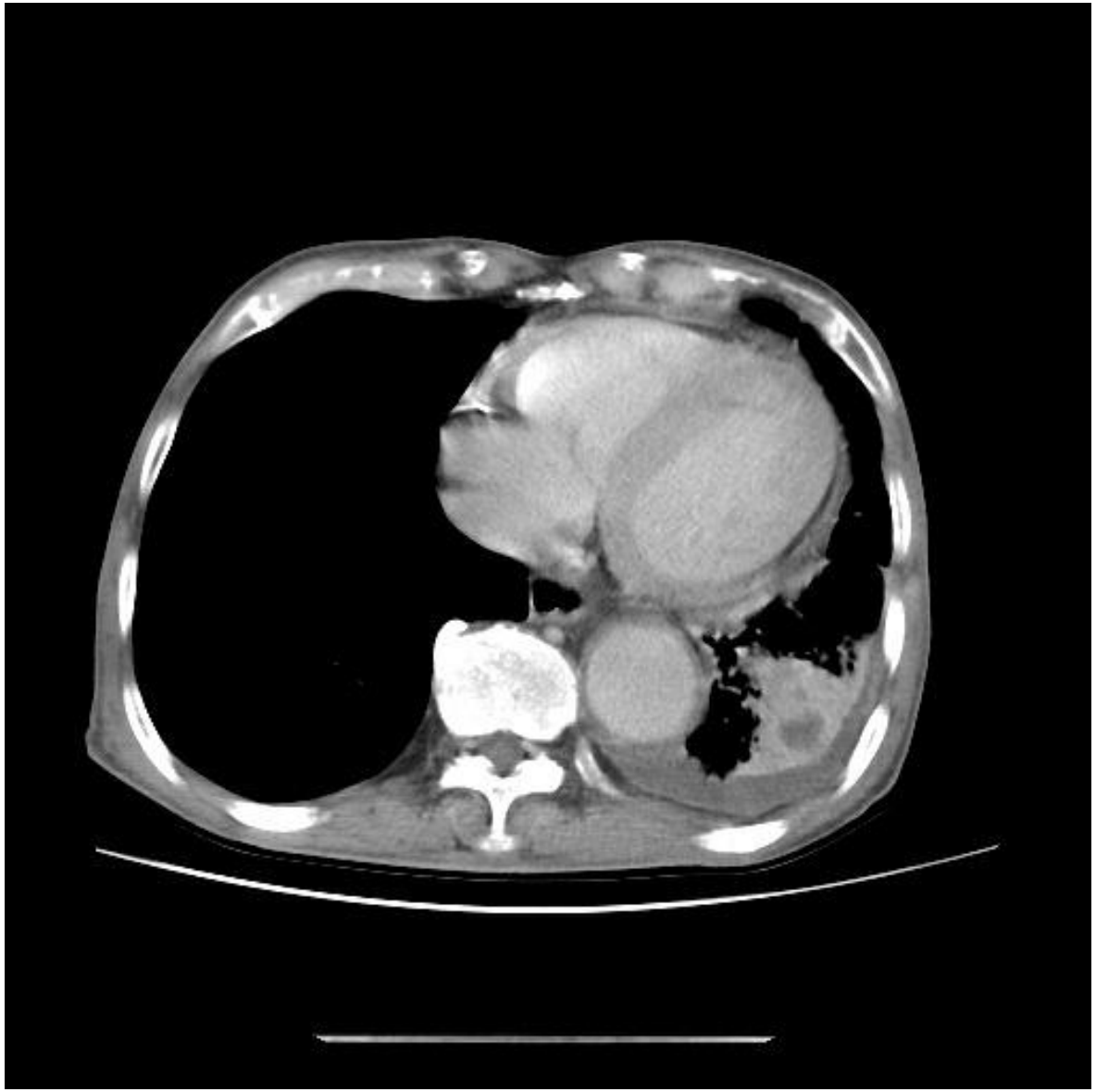
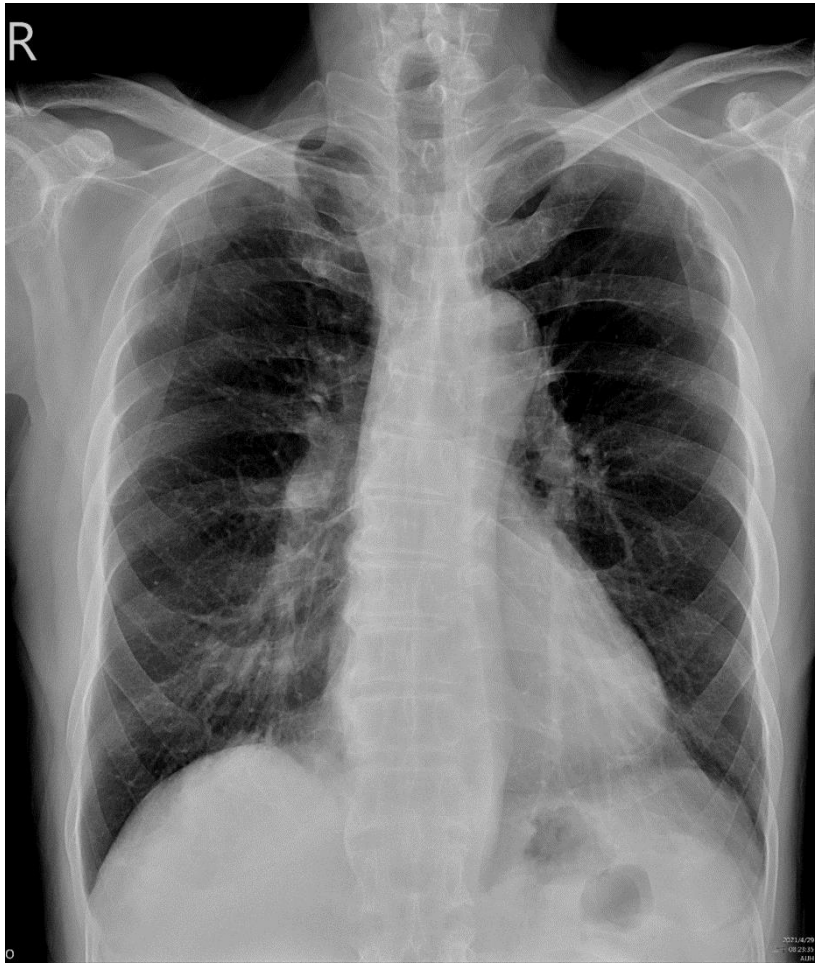
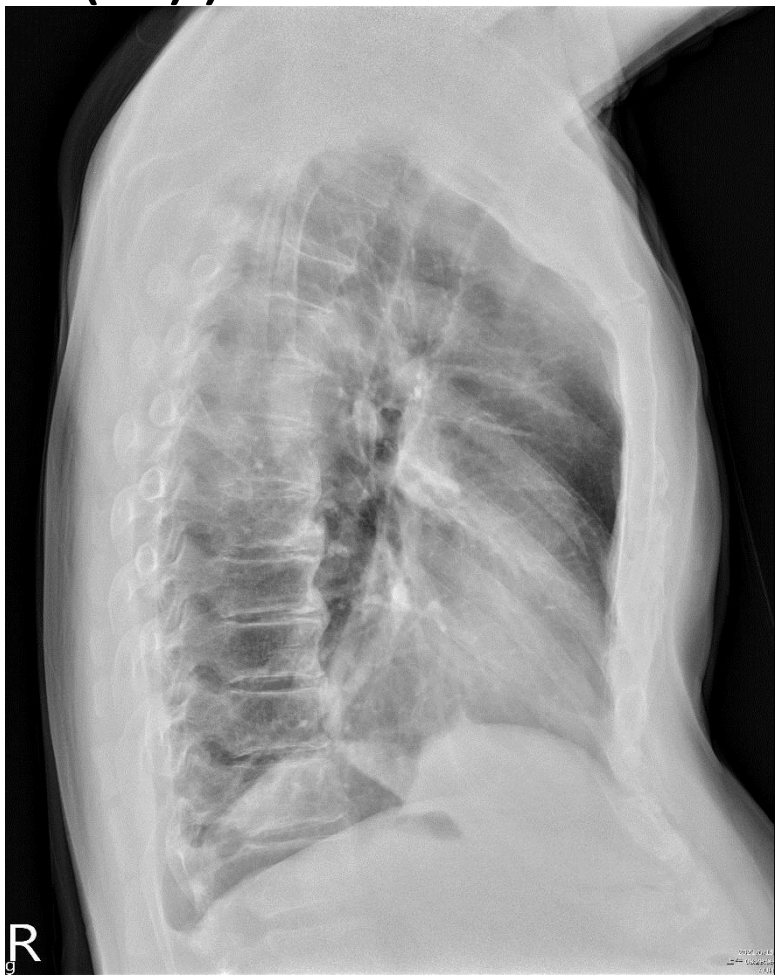


1.9 Septic pulmonary embolism

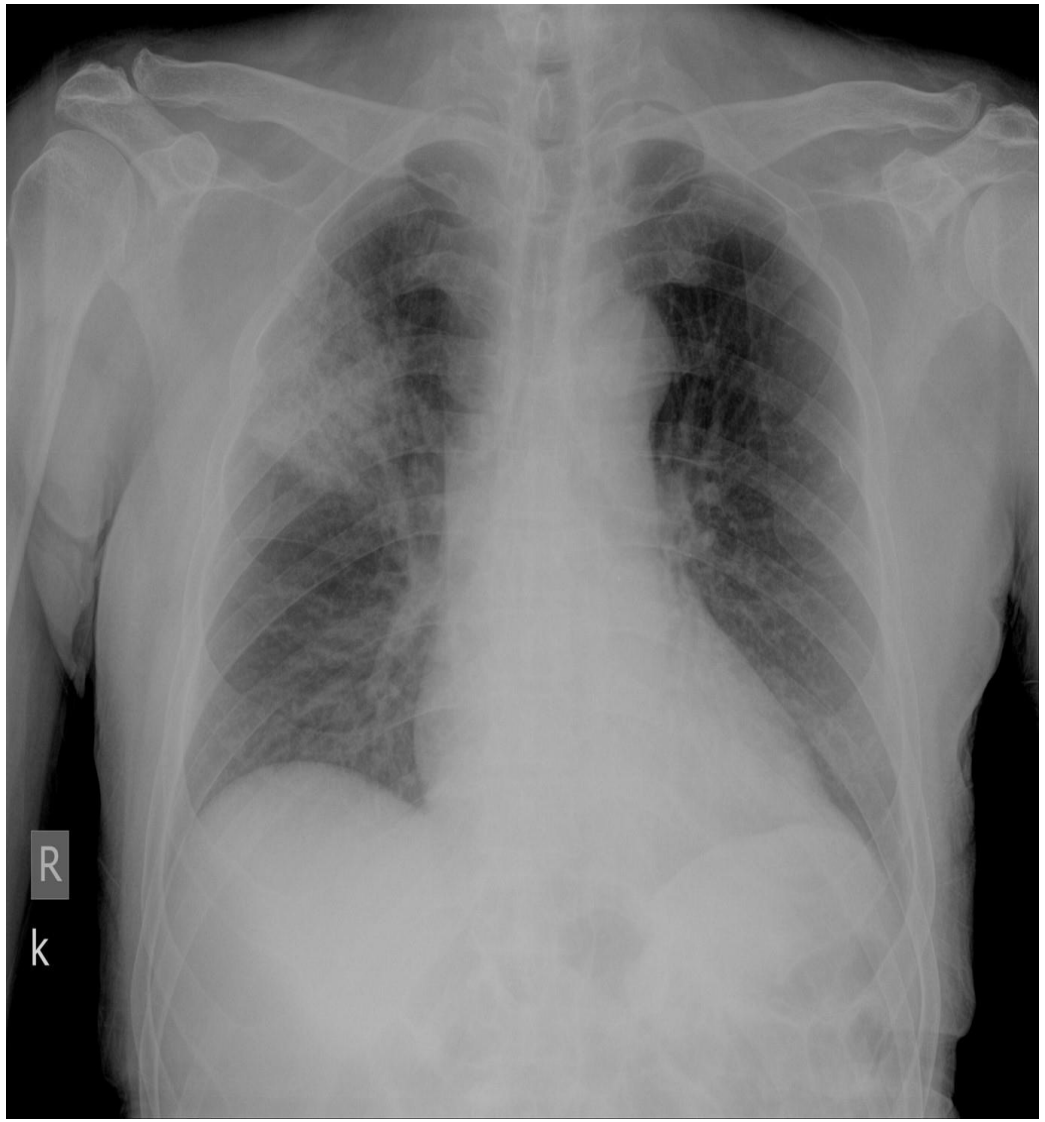
Figure A

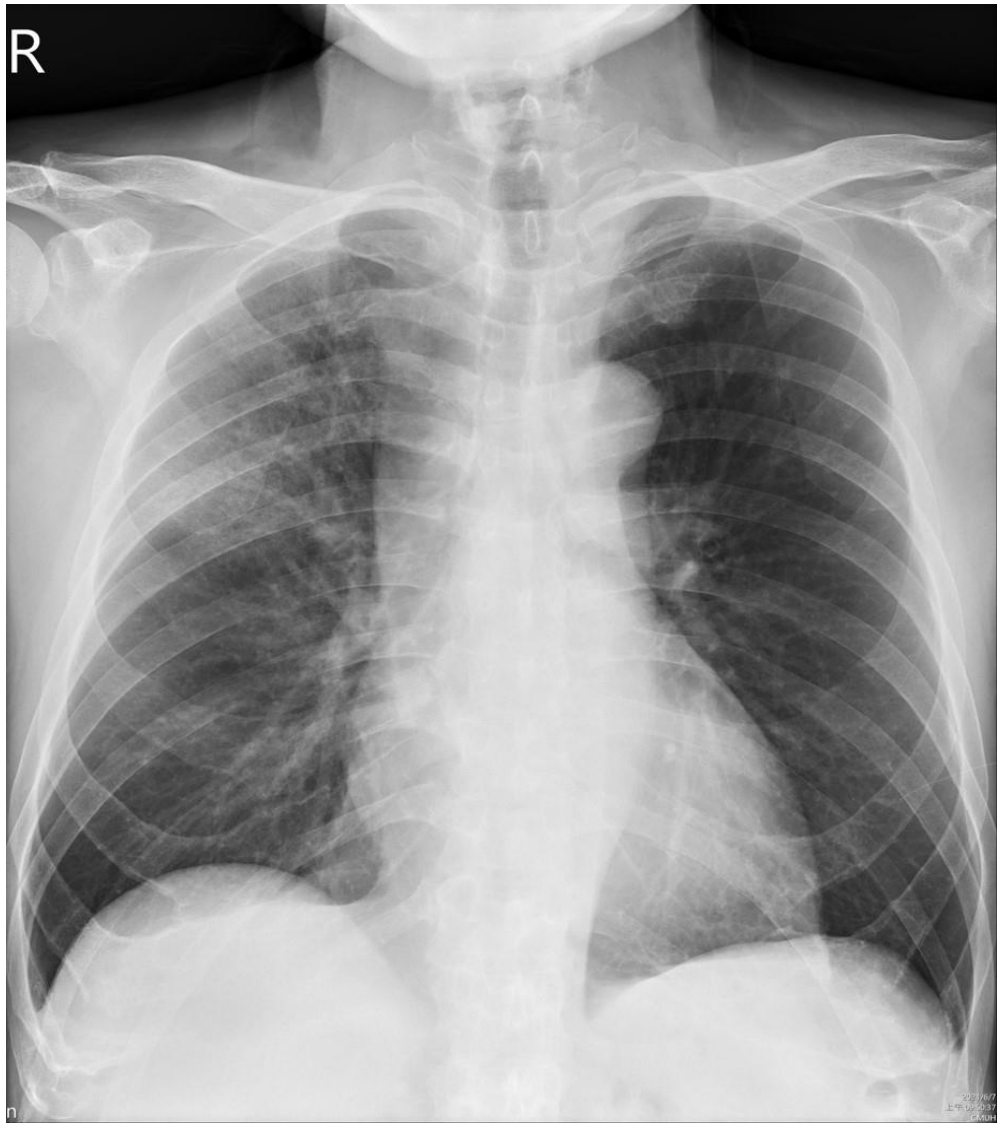
1.10 Cryptococcosis(Cryptococcal antigen blood: 1:>2560(+))



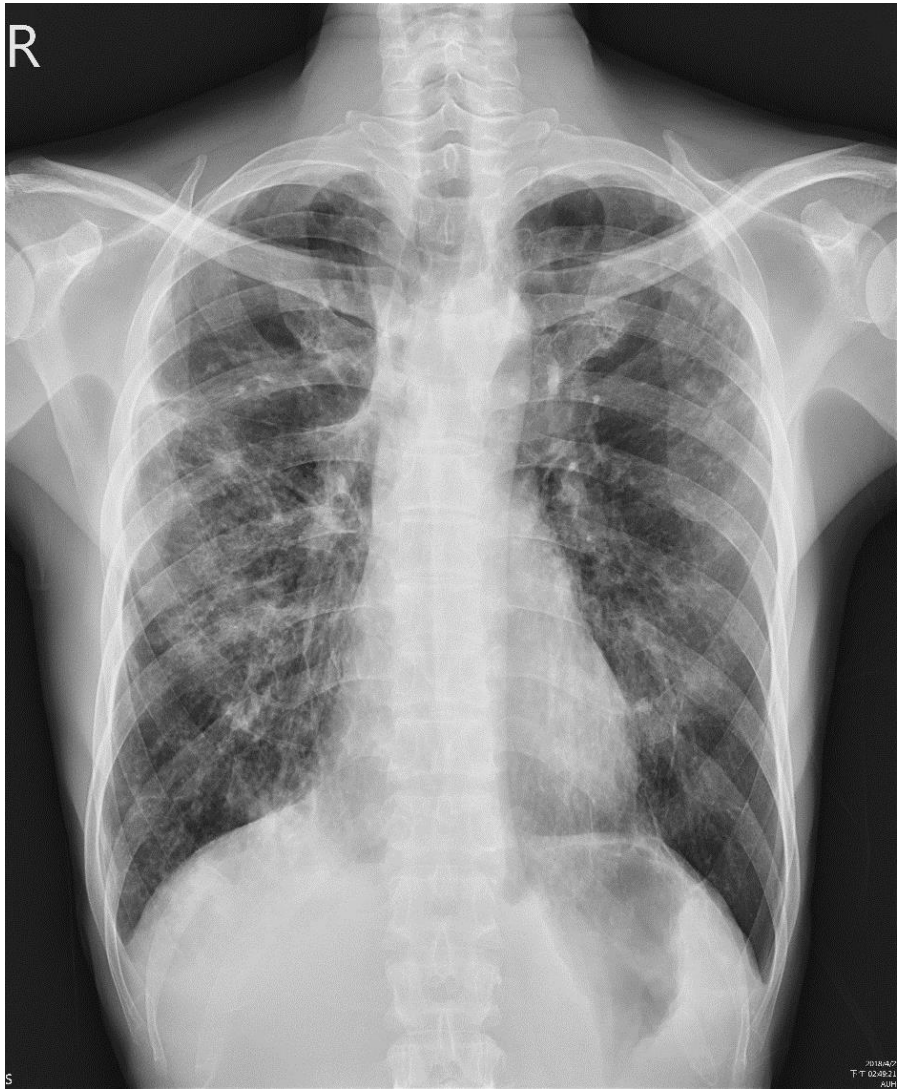


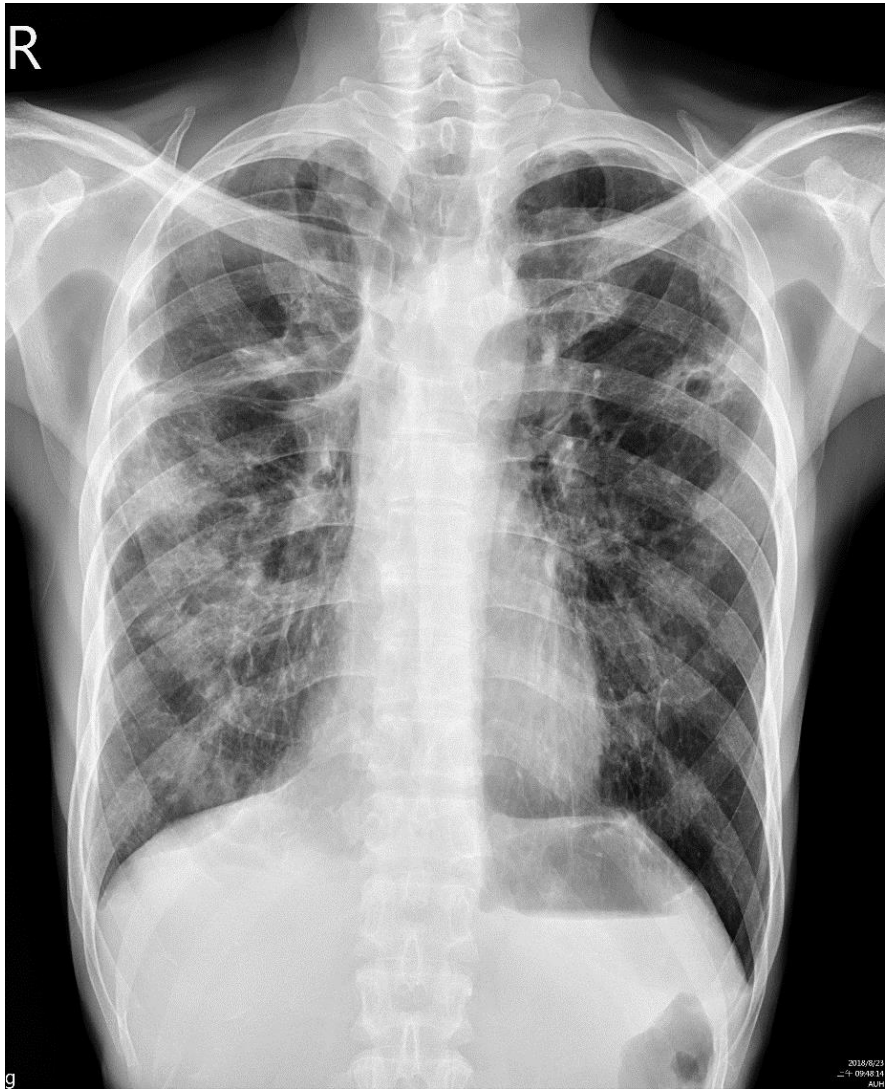
1.11 Viral Pneumonia COVID-19 RT-PCR (+)



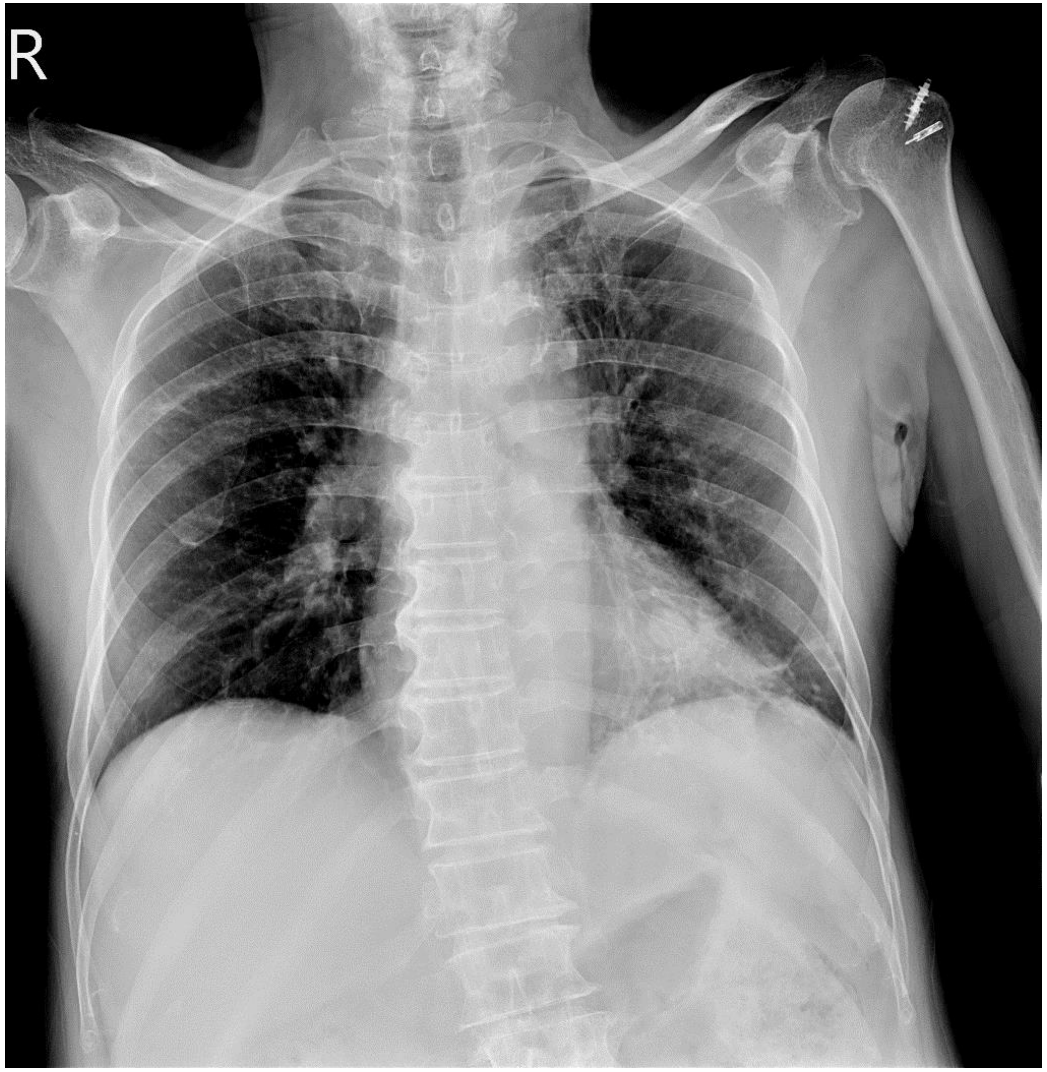


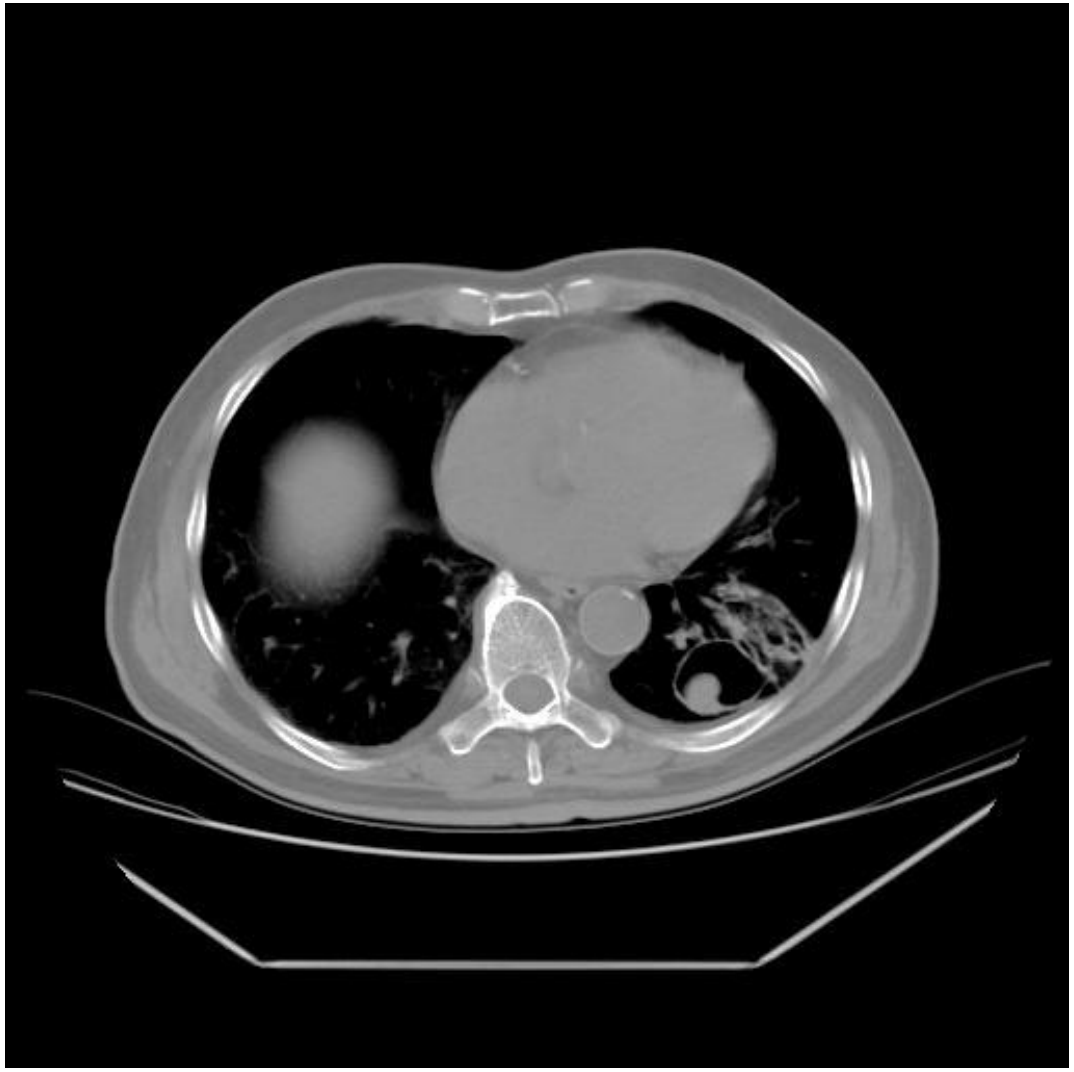
1.12 Pulmonary Tuberculosis



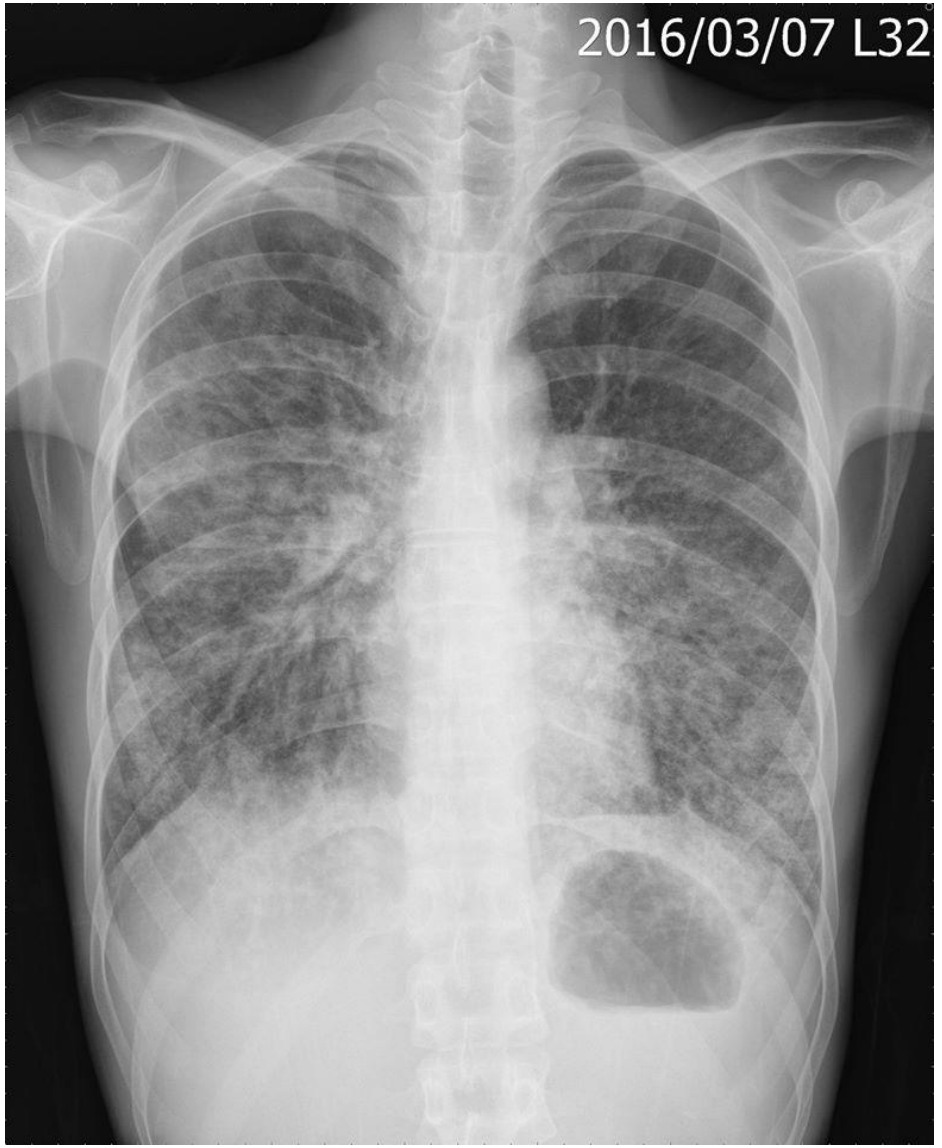


1.13 Fungus infection (Aspergillus spp.)





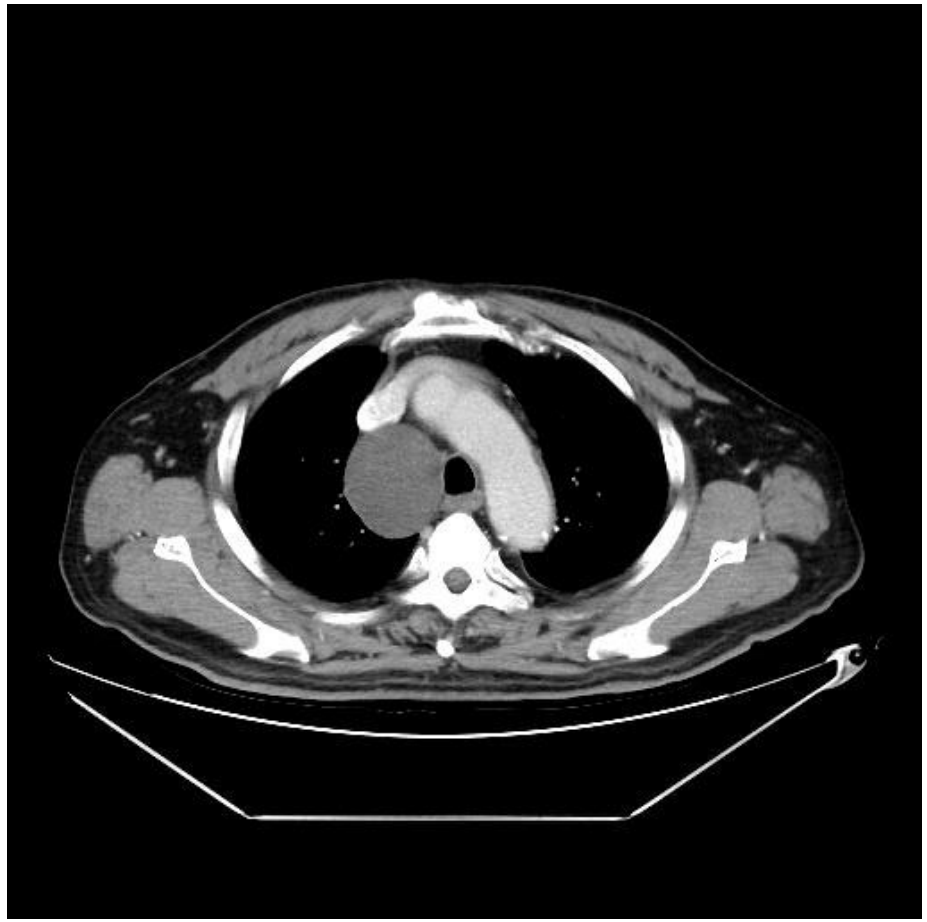
1.14 Pneumocystic Jiroveci pneumonia (PJP)



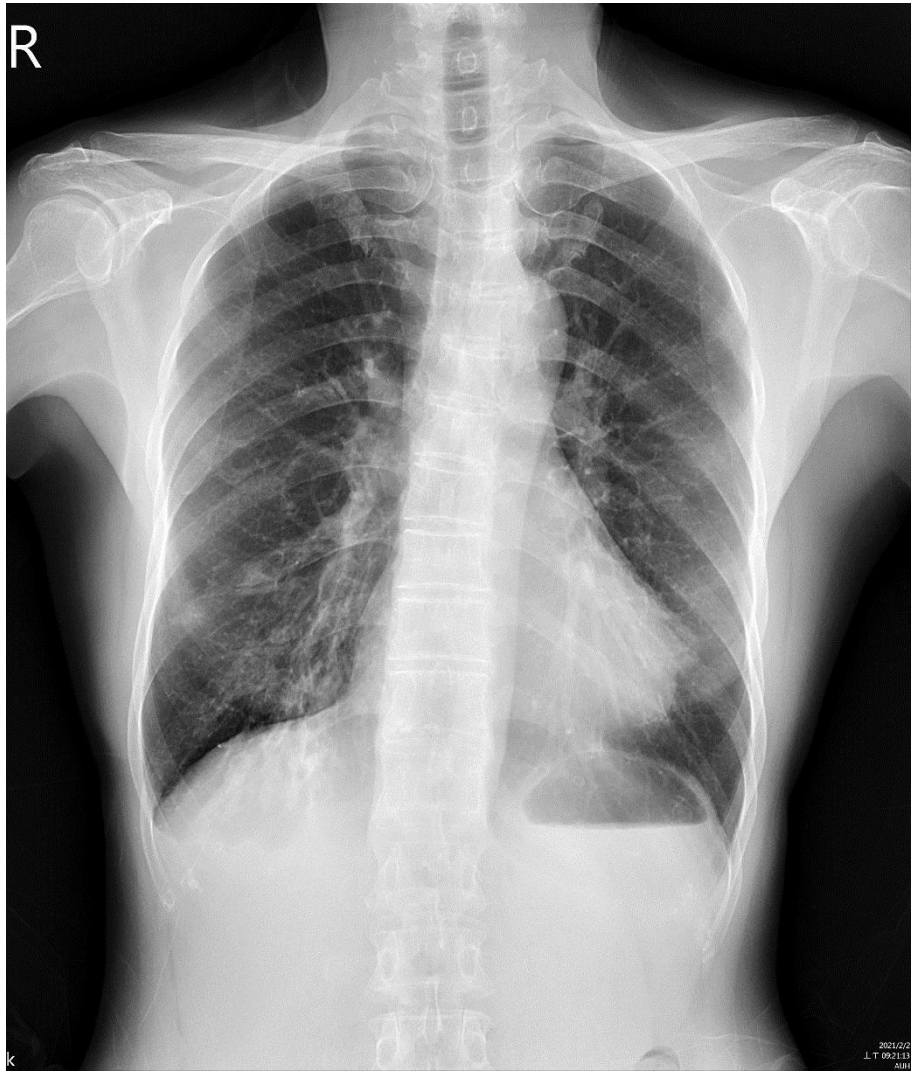
2. 呼吸道疾病

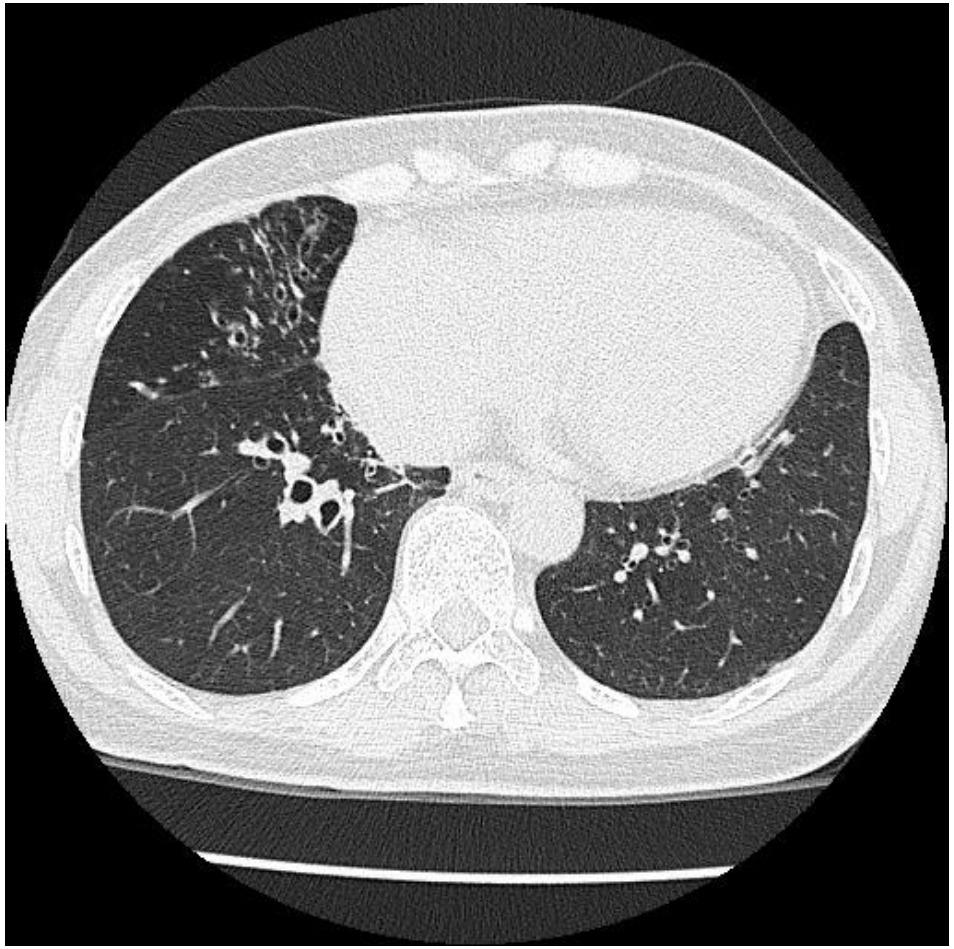
- Large airway disease
- Small airway disease
- Lung parenchyma

2.1 Bronchogenic Cyst

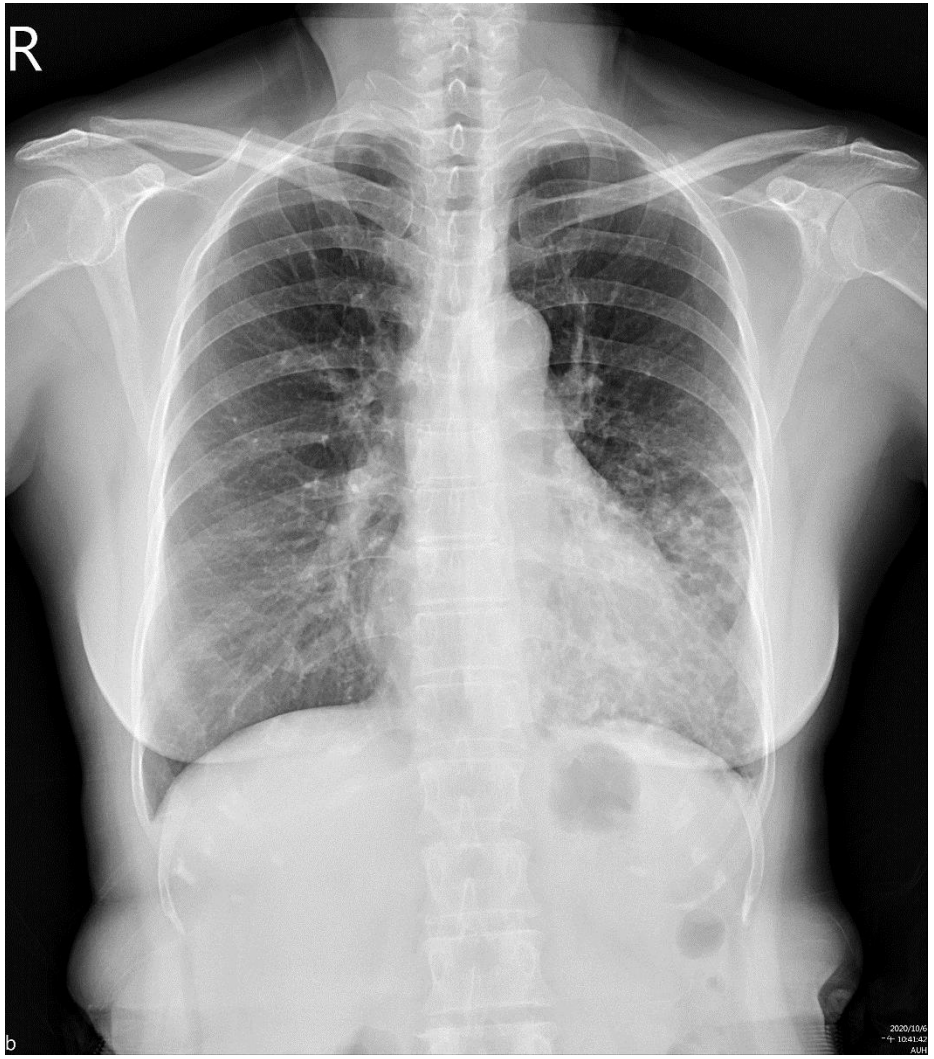


2.2 Bronchiectasis

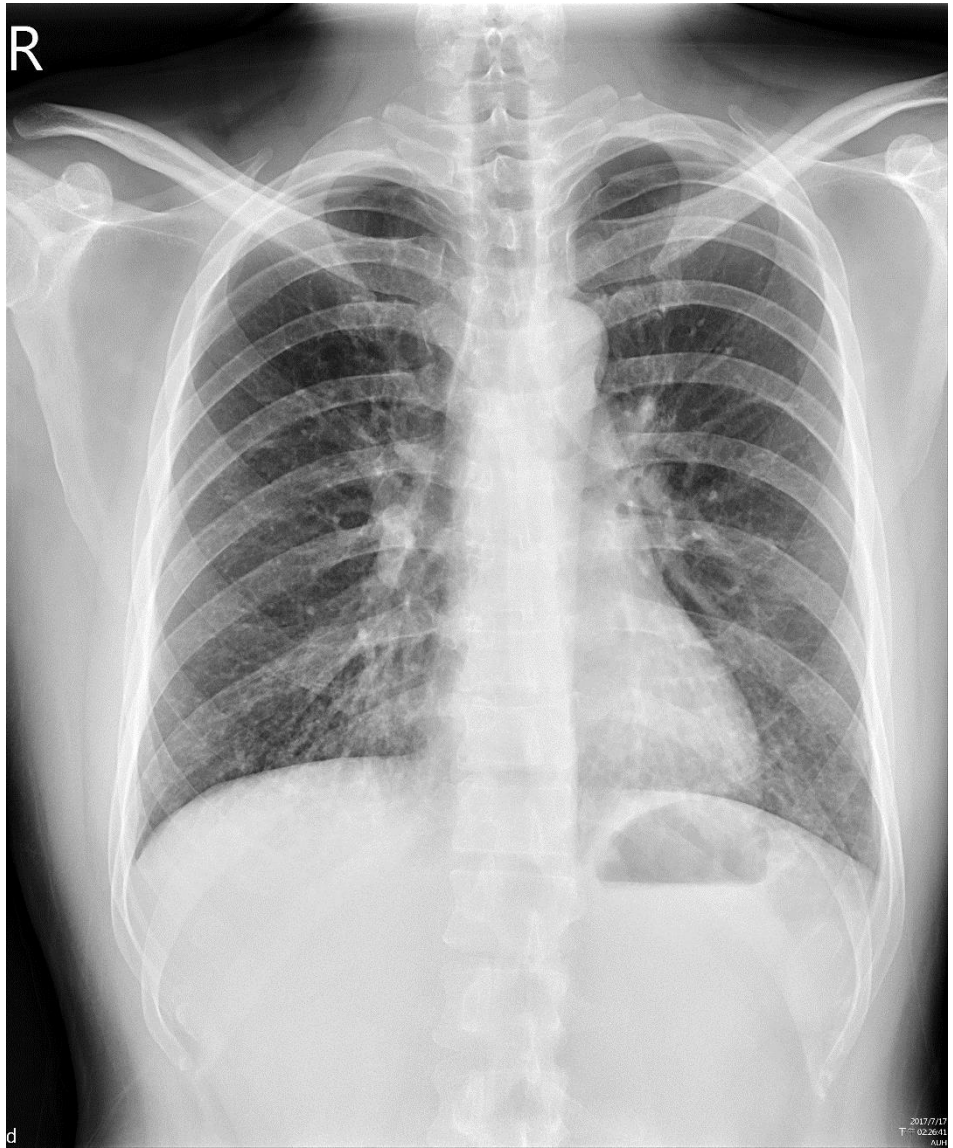


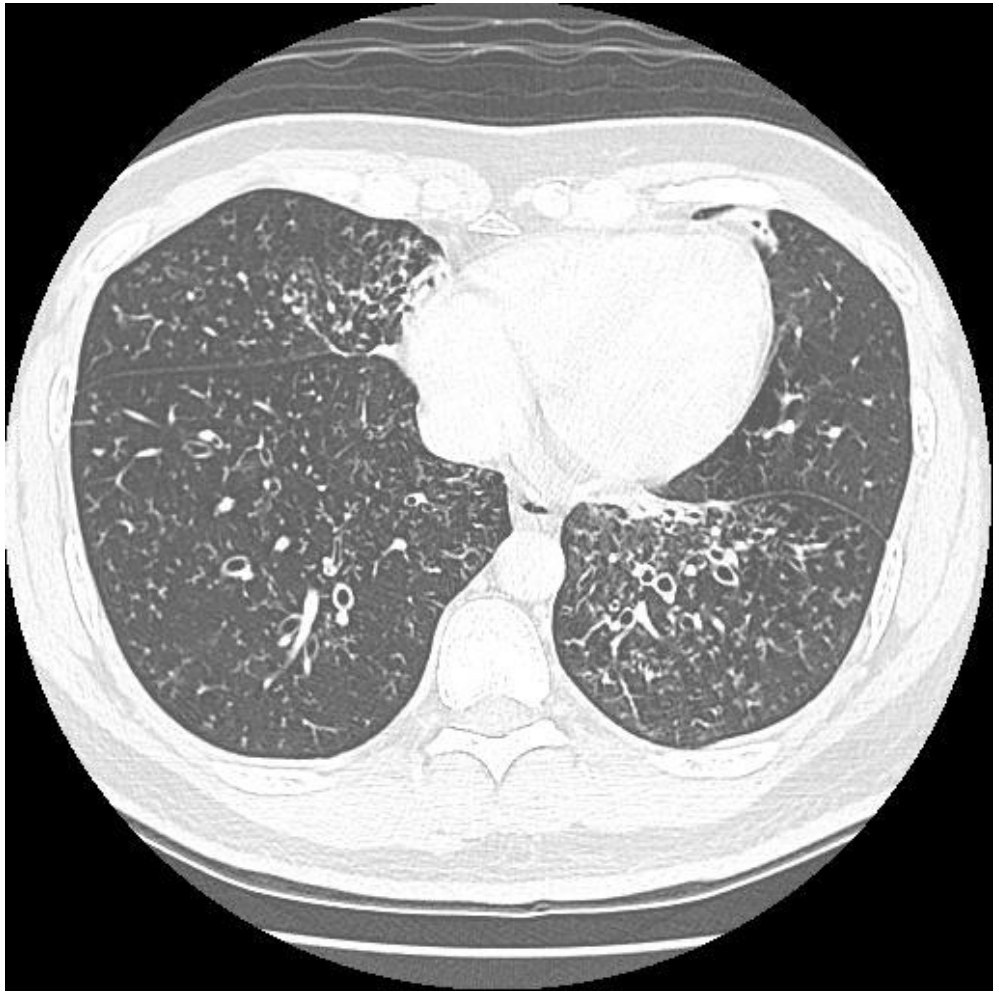


2.3 Cystic Bronchiectasis

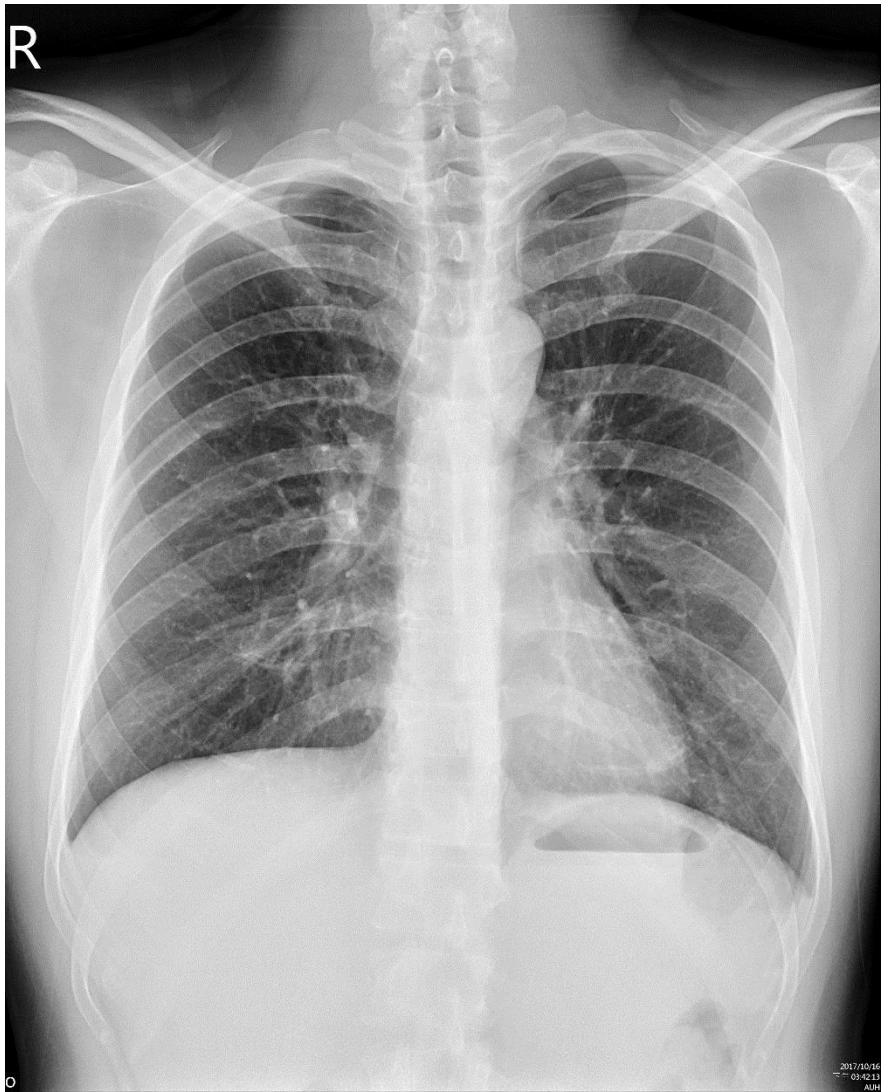


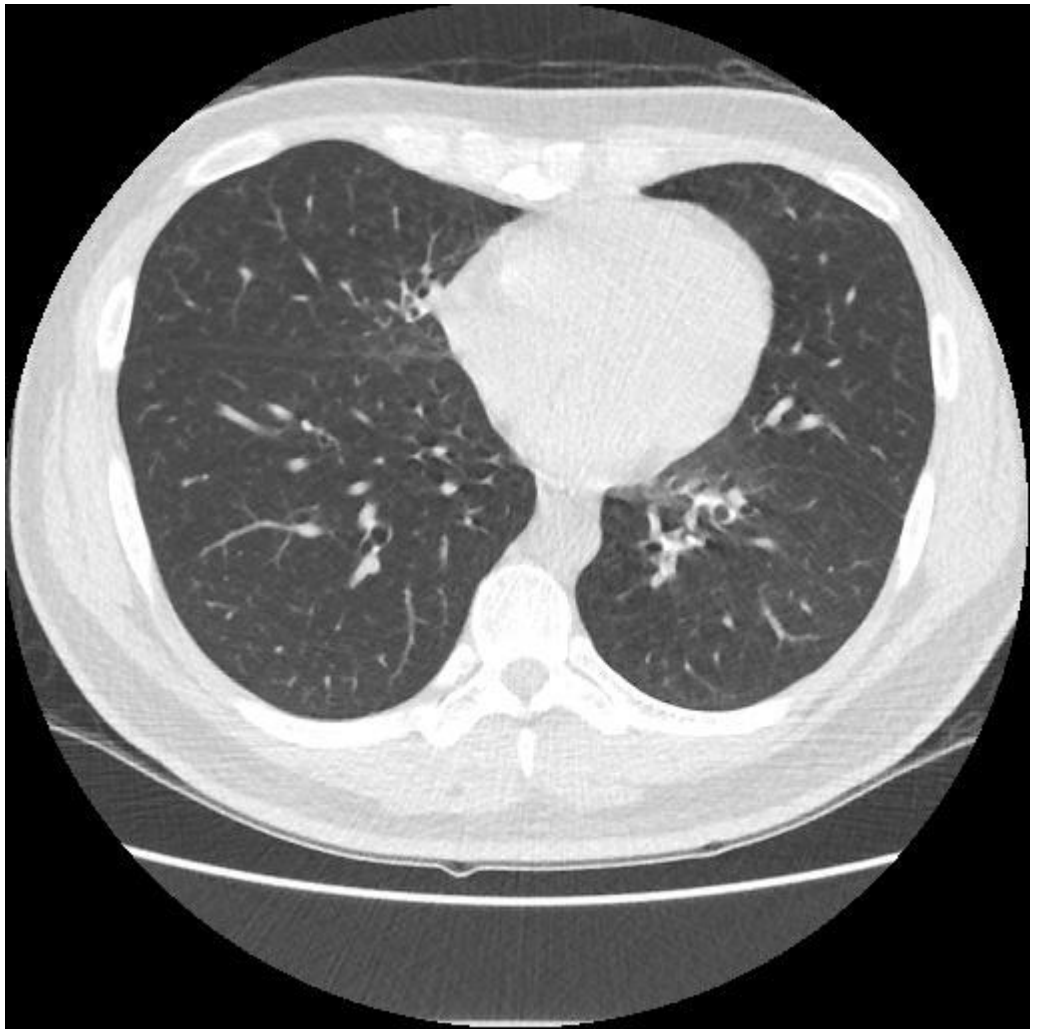
2.4 Diffuse Panbronchiolitis





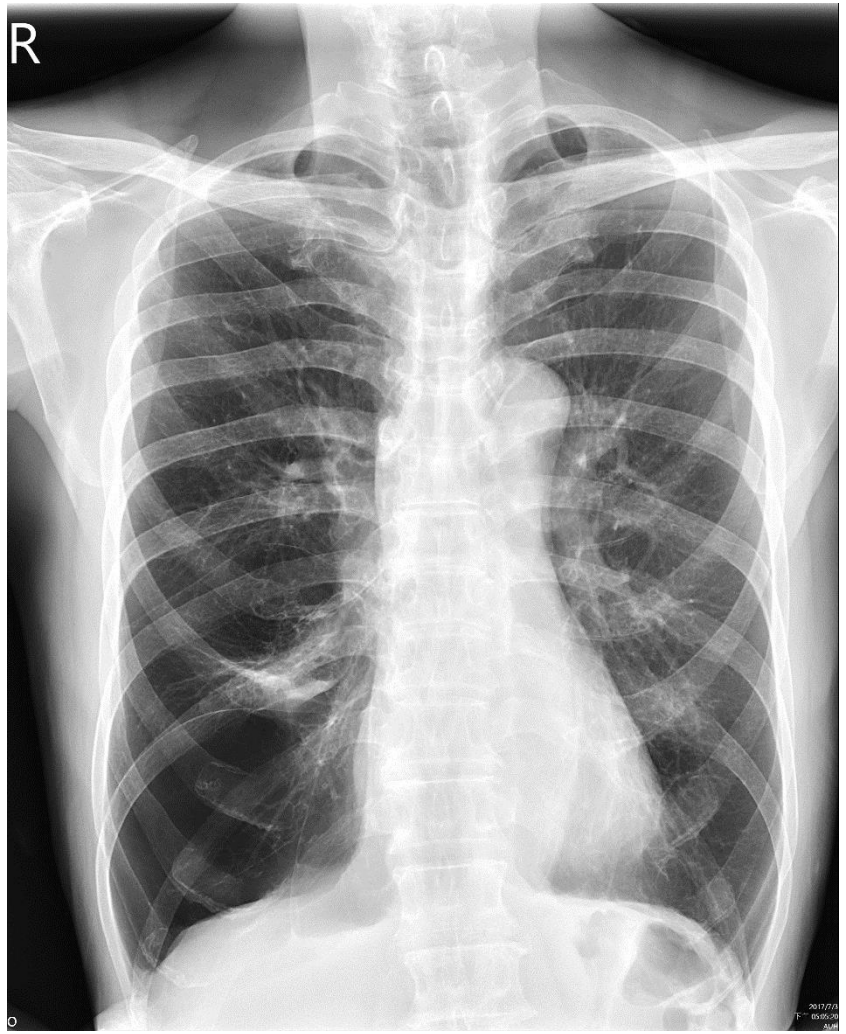
After treatment

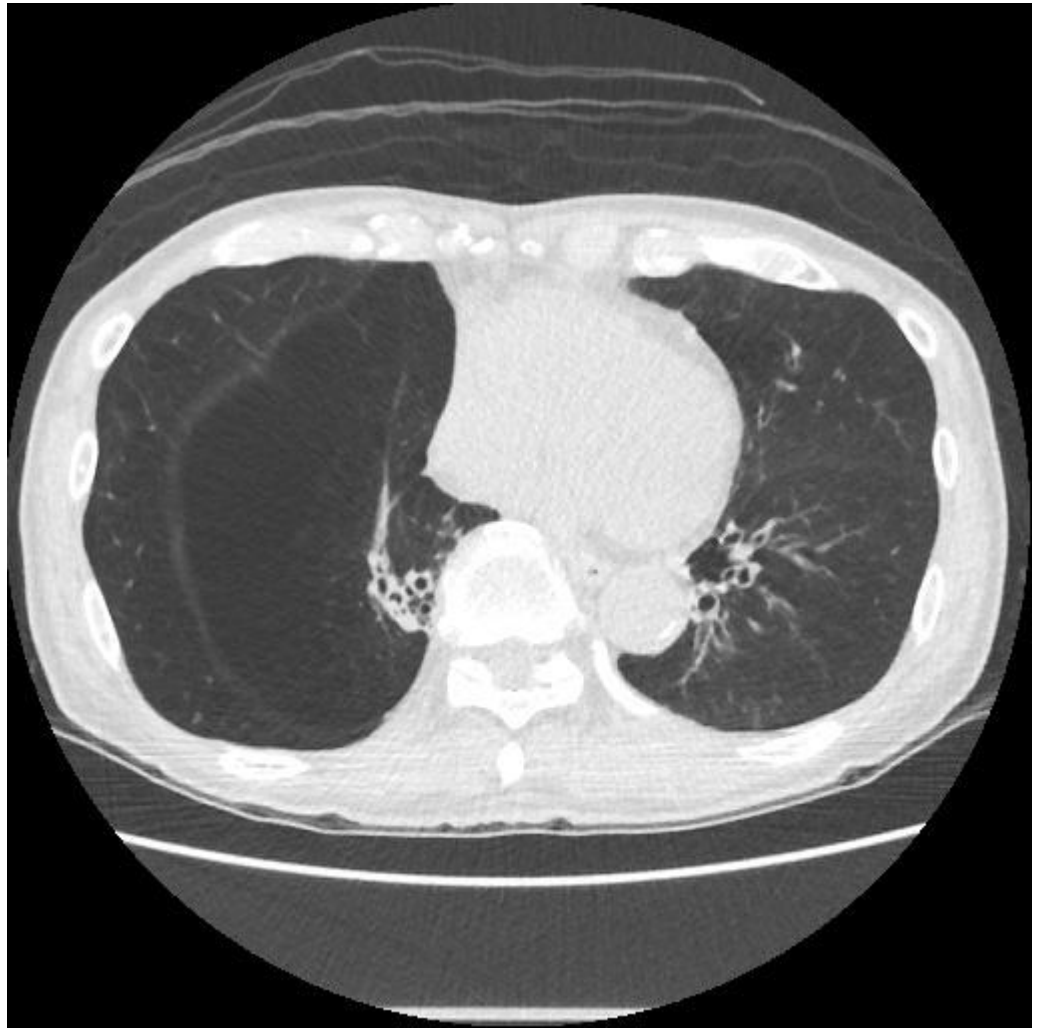




2.5 Progressive massive fibrosis(PMF)

2.6 Emphysema with giant bullae





結論

- 感染症之CXR 影像判讀，往往需要配合臨床病史、細菌學、以及一系列影像變化，另外注意是否有併發症。
- 若是單獨一次影像，無舊片可以比較，配合電腦斷層，可有較多資訊供判讀；其中: Pneumococcus, Klebsiella pneumonia, septic emboli, TB 有較特殊影像可供鑑別診斷。
- 許多疾病影像類似感染症，需要（配合臨床）鑑別診斷。
- 小氣道疾病，電腦斷層檢查對大部分診斷有幫助。