胸部影像判讀

肺部感染症及呼吸道疾病之影像判讀

國泰醫院 呼吸胸腔科

吳錦桐醫師

時間：**2020/08/09**

先透視、再判讀

“Perspective Physical Examination” before Interpretation

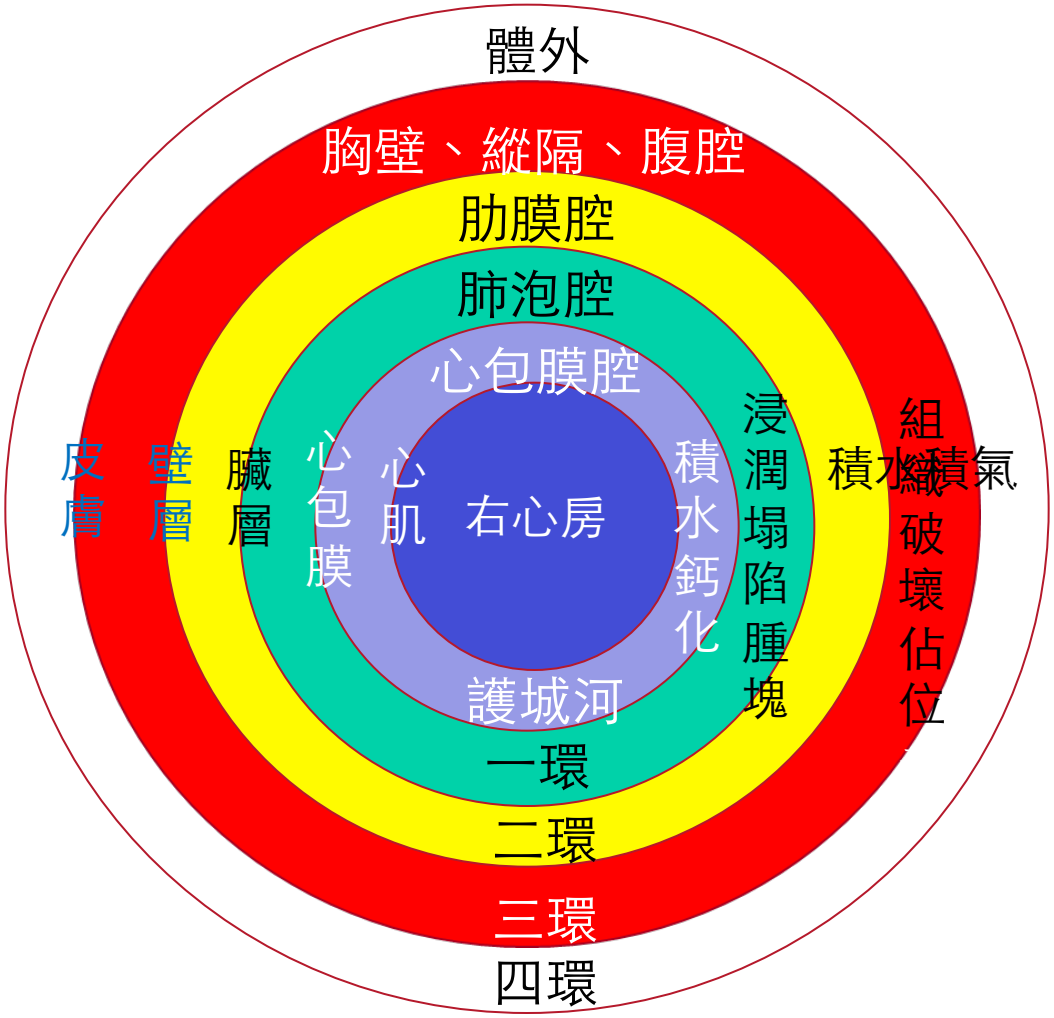
透視胸部影像入門功

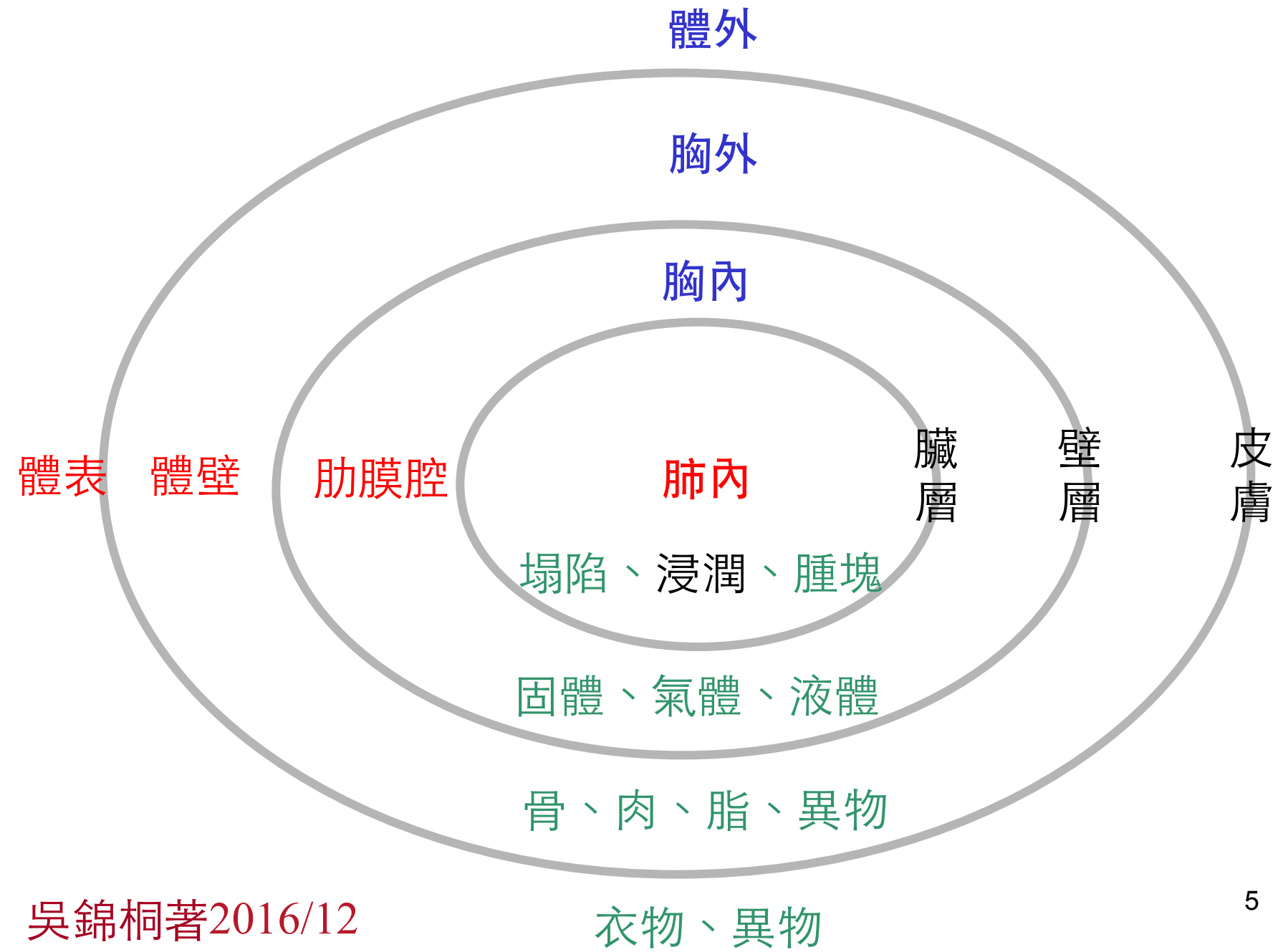
影像屬性		部位	輔助工具	判讀要領
方位	大小	左右	縱向九線	脊柱中線、脊柱左線、脊柱右線 氣管中線 (左側線、右側線) 縱膈左凸線、縱膈右凸線、降主動脈線 肋膜臟層線、肋膜壁層線: 側胸或縱膈側(前、後)
		上下	橫向四線	橫膈高低線(左低右高) 肺門高低線 (左高右低) 肋骨對稱線 肺小裂半線
		前後	輪廓癥	Silhouette sign
顏色	黑白	肺內 肋膜 體壁	CT Number	金屬> 鈣化 >骨皮>骨髓>軟組織>液體(0) >油脂(-100)>空氣(-1000)
重量	乾濕	血管內外	大小循環; 充血浸潤	血管內(充血):小循環(肺靜脈) 血管內(充血):大循環(上下腔靜脈、 上奇下肝脾) 血管外(浸潤):間質、肺泡、肋膜腔

吳錦桐著

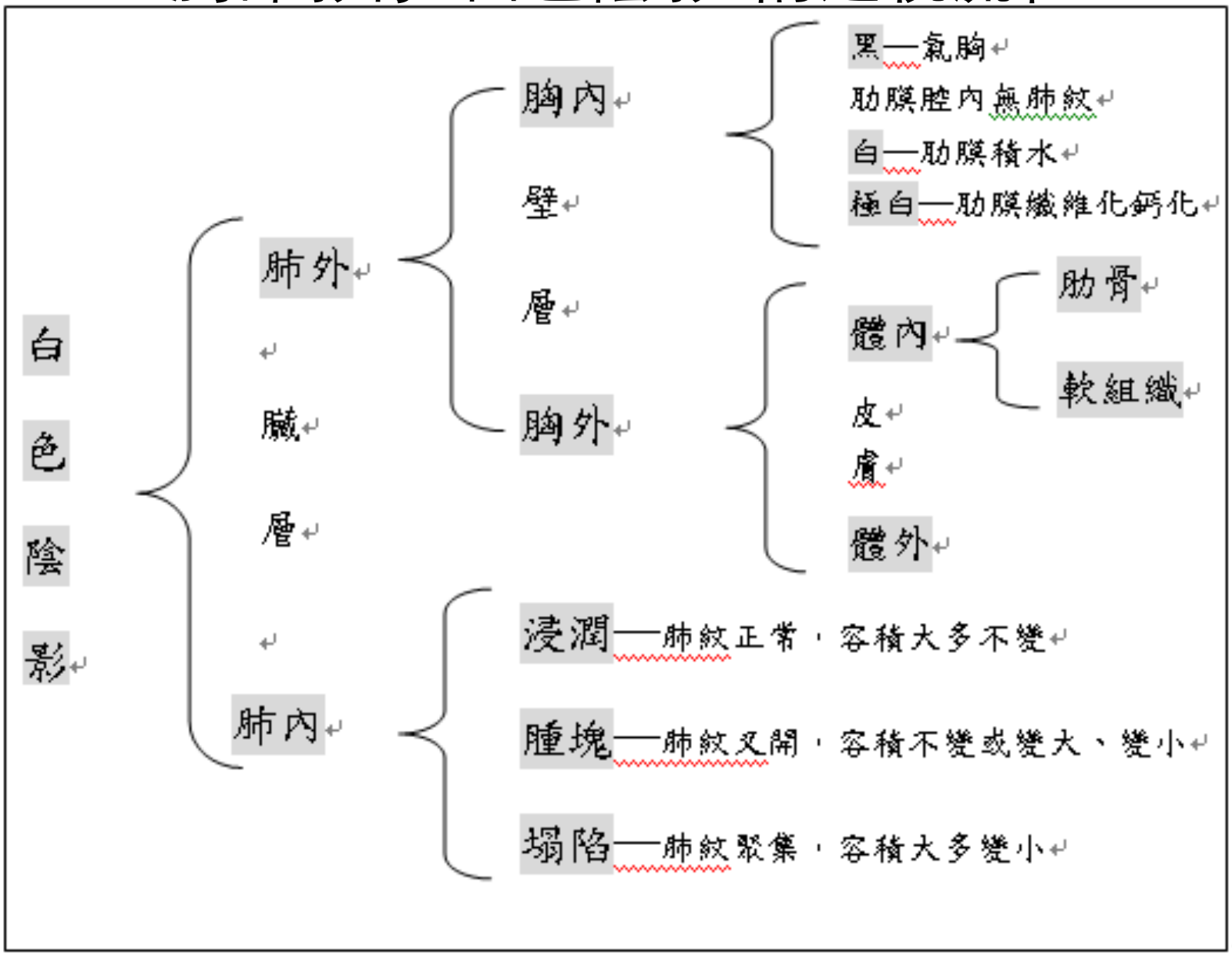
肺內、肋膜腔、胸壁、體外

(體腔-城堡環道理論)

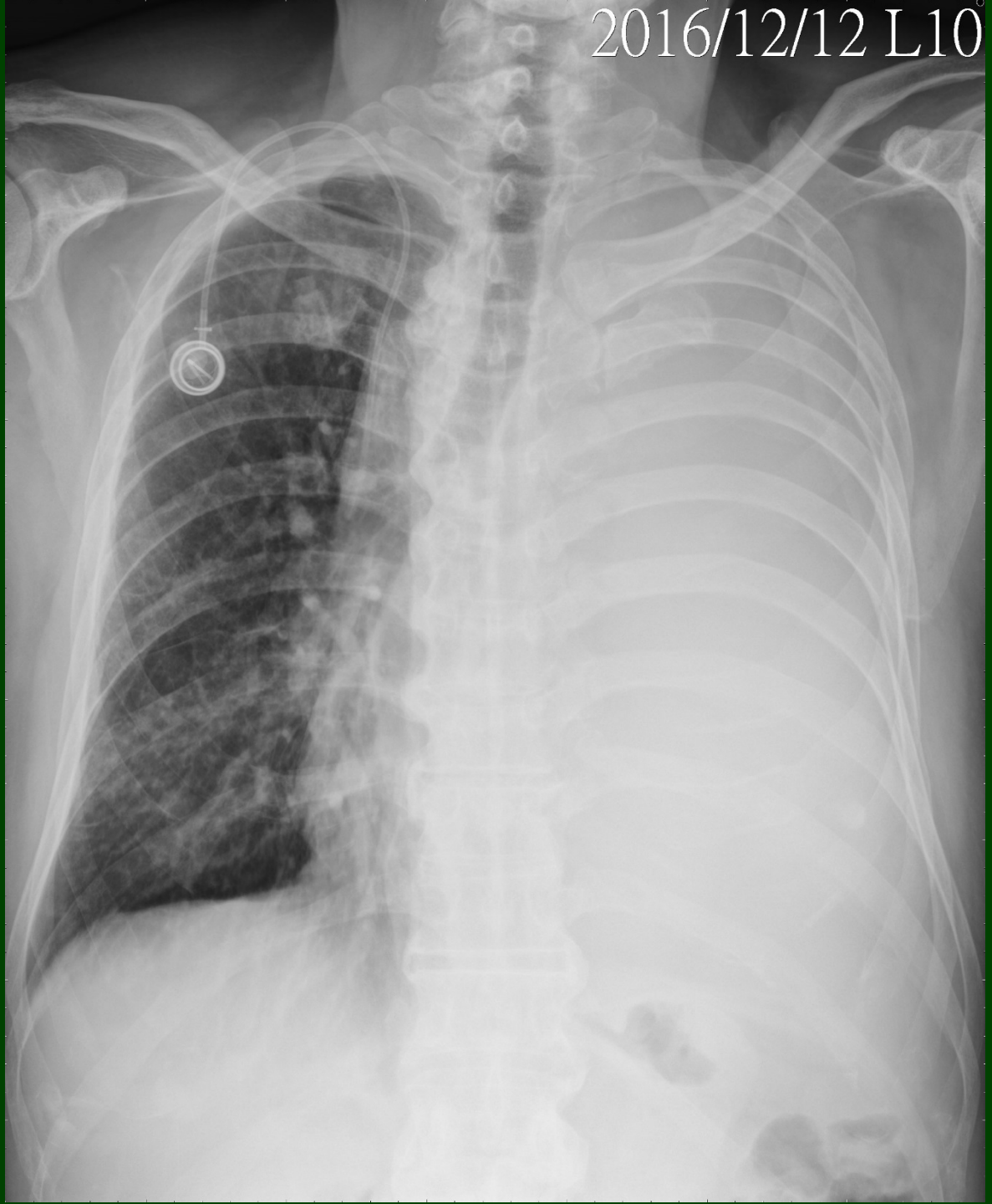



體外
胸外
胸內
體表
體壁
肋膜腔
肺內
臟層
壁層
皮膚
塌陷、浸潤、腫塊
固體、氣體、液體
骨、肉、脂、異物
衣物、異物

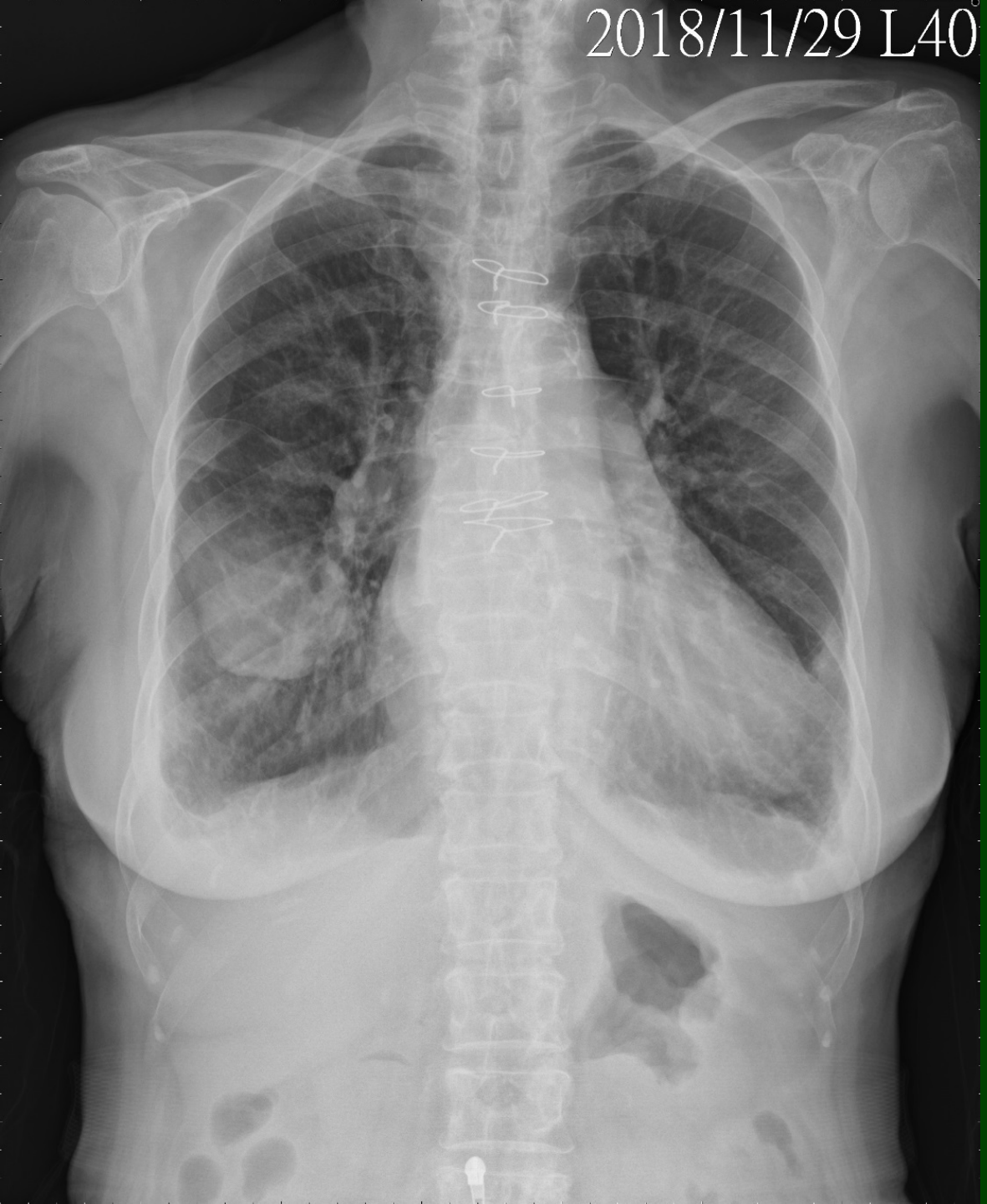
胸部影像”白色陰影”的透視流程



吳錦桐著



請透視判讀
您認為最可能的診斷?



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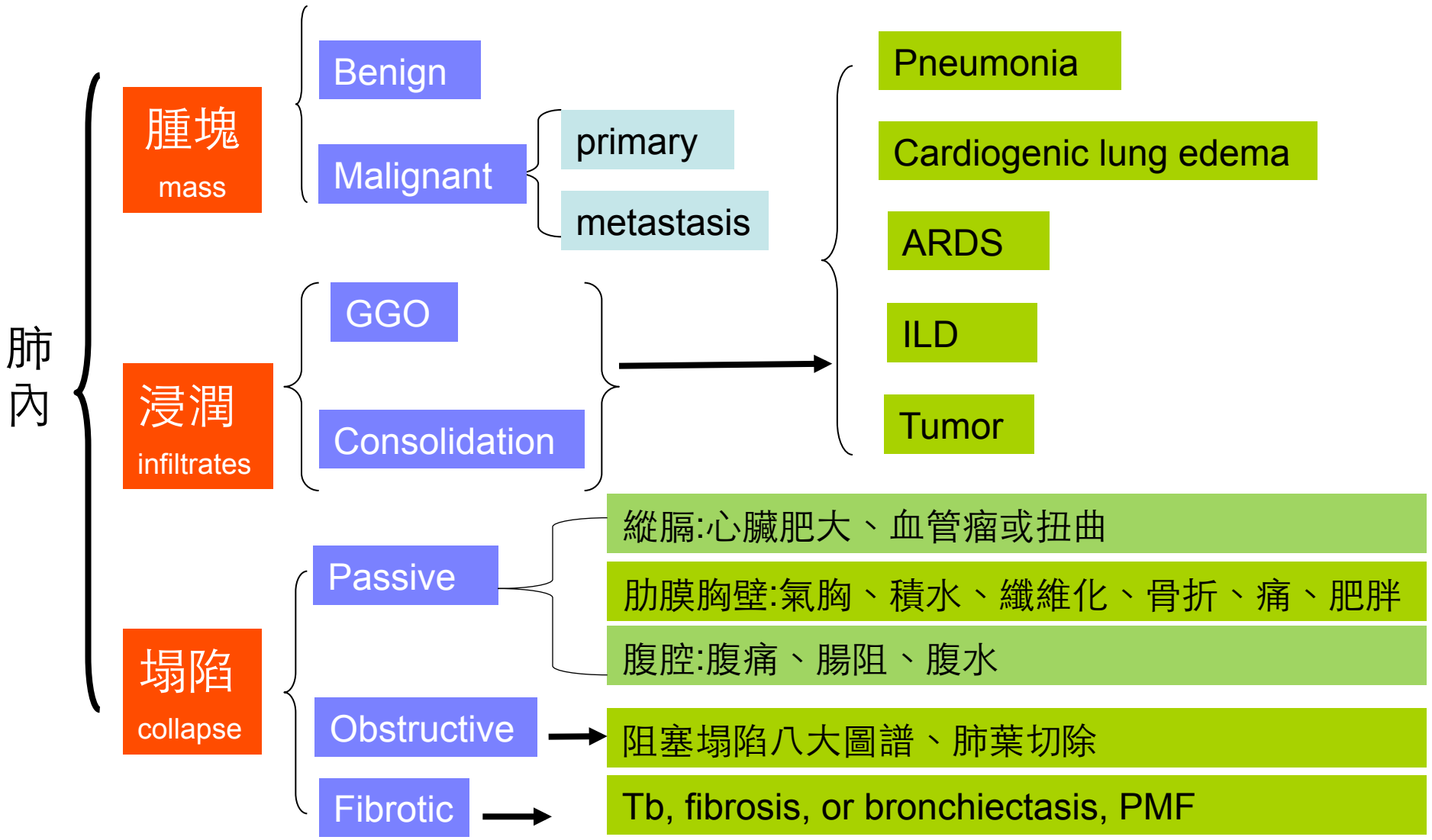
Frontal CxR見到"肺內"白色陰影的判讀流程



影像分類　　致病機轉　　可能疾病

By Dr. 吳錦桐

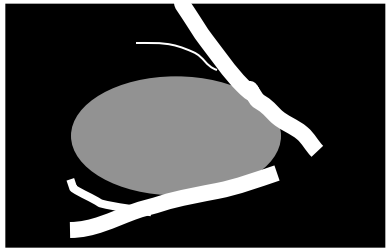
浸潤、腫塊、與塌陷

1.〔正常─lung markings在原來位置〕

背景黑、肺部血管清晰顯影、支氣管空氣柱不易顯像

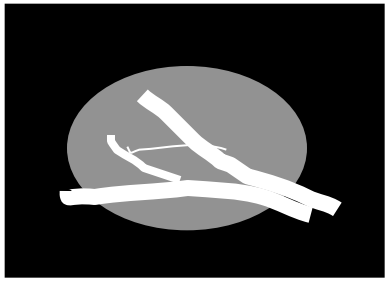
2.〔浸潤─Consolidation--lung markings在原來位置，白斑邊境通常較模糊，常以肋膜為邊境〕

背景反白、但肺部血管無法顯影、支氣管空氣柱反而清楚顯像，有如支氣管攝影，即所謂的Air-bronchogram --- consolidation



3.〔腫塊—lung markings被岔開，白斑邊境通常較明確，與正常肺野涇渭分明。

Space-occupying lesion with spreading markings

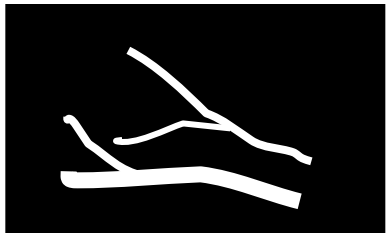


4.〔塌陷—lung markings塌在一塊，白斑邊境通常較明確，常以肋膜為邊境〕

Atelectasis with crowding markings

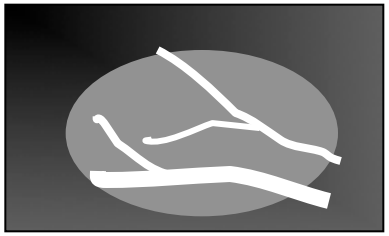
By Dr. 吳錦桐

浸潤、腫塊、與塌陷



1.〔正常─lung markings在原來位置〕

背景黑、肺部血管清晰顯影、支氣管空氣柱不易顯像

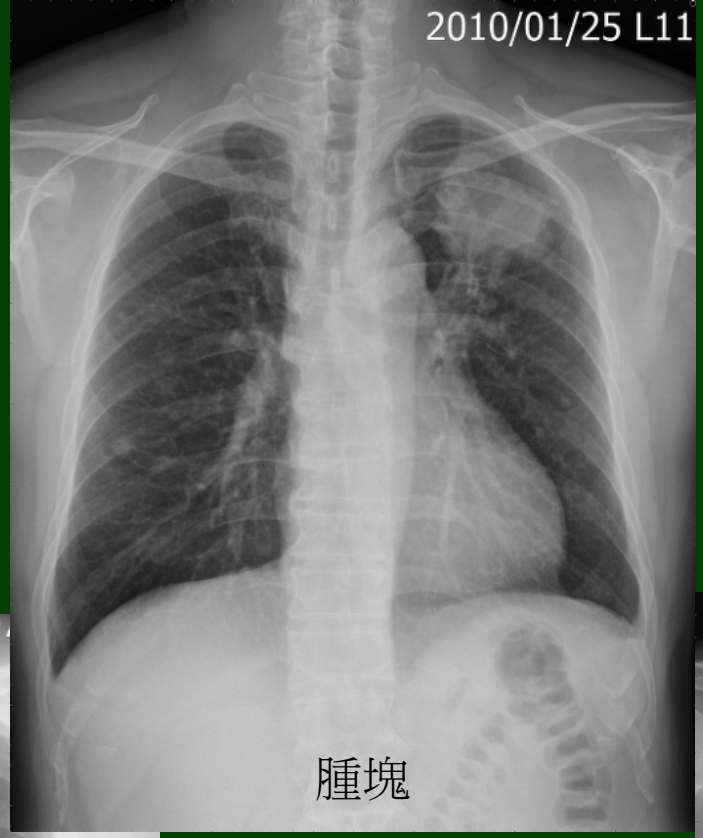


2-1.〔浸潤─GGO--lung markings在原來位置，白斑邊境通常較模糊，常以肋膜為邊境〕

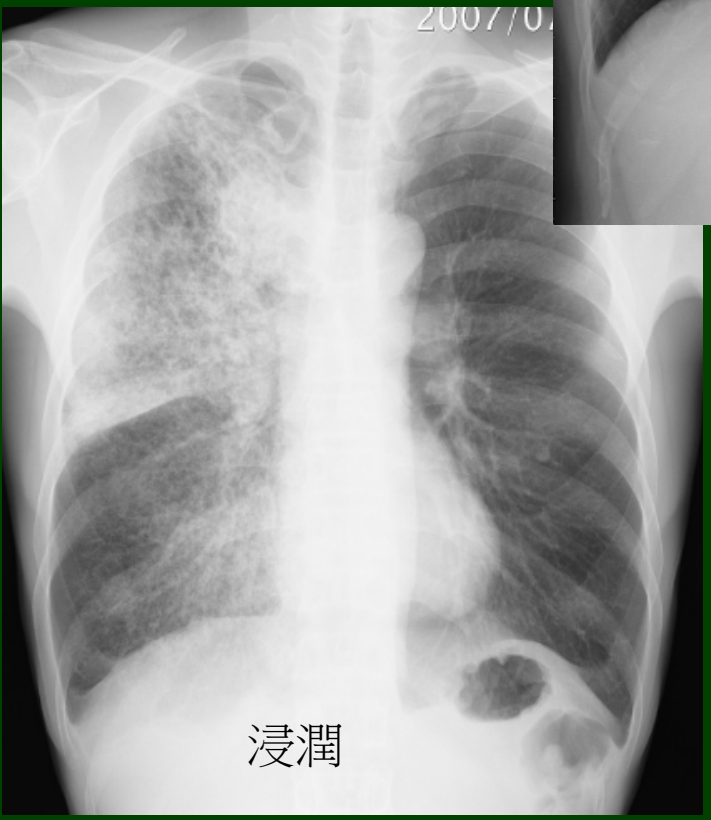
背景反白、但肺部血管仍可清晰顯影、支氣管空氣柱仍不易顯像，有如毛玻璃狀 Ground Glass Opacity (GGO)

2-2.〔浸潤─Consolidation--lung markings在原來位置，白斑邊境通常較模糊，常以肋膜為邊境〕

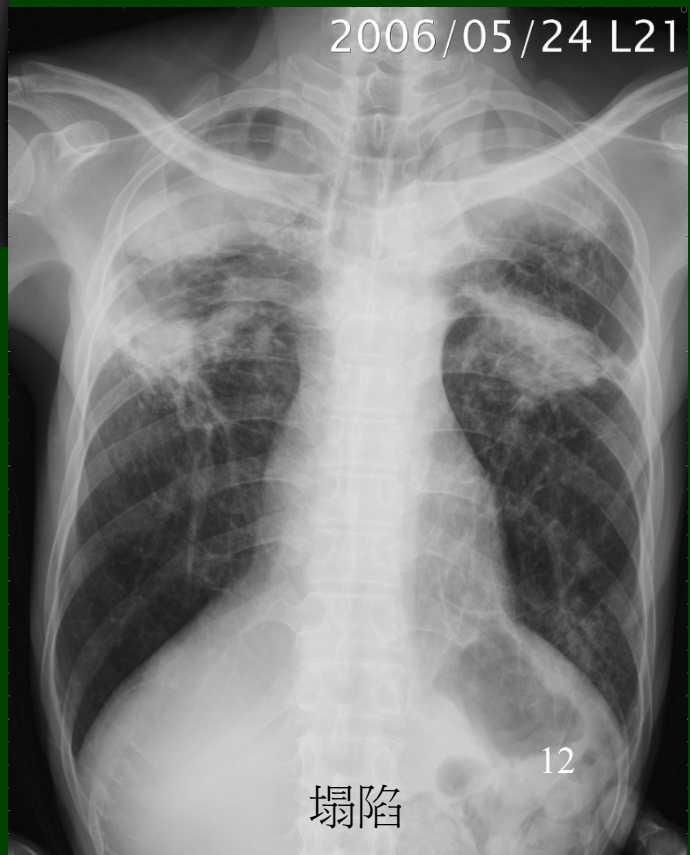
背景反白、但肺部血管無法顯影、支氣管空氣柱反而清楚顯像，有如支氣管攝影，即所謂的Air-bronchogram --- consolidation



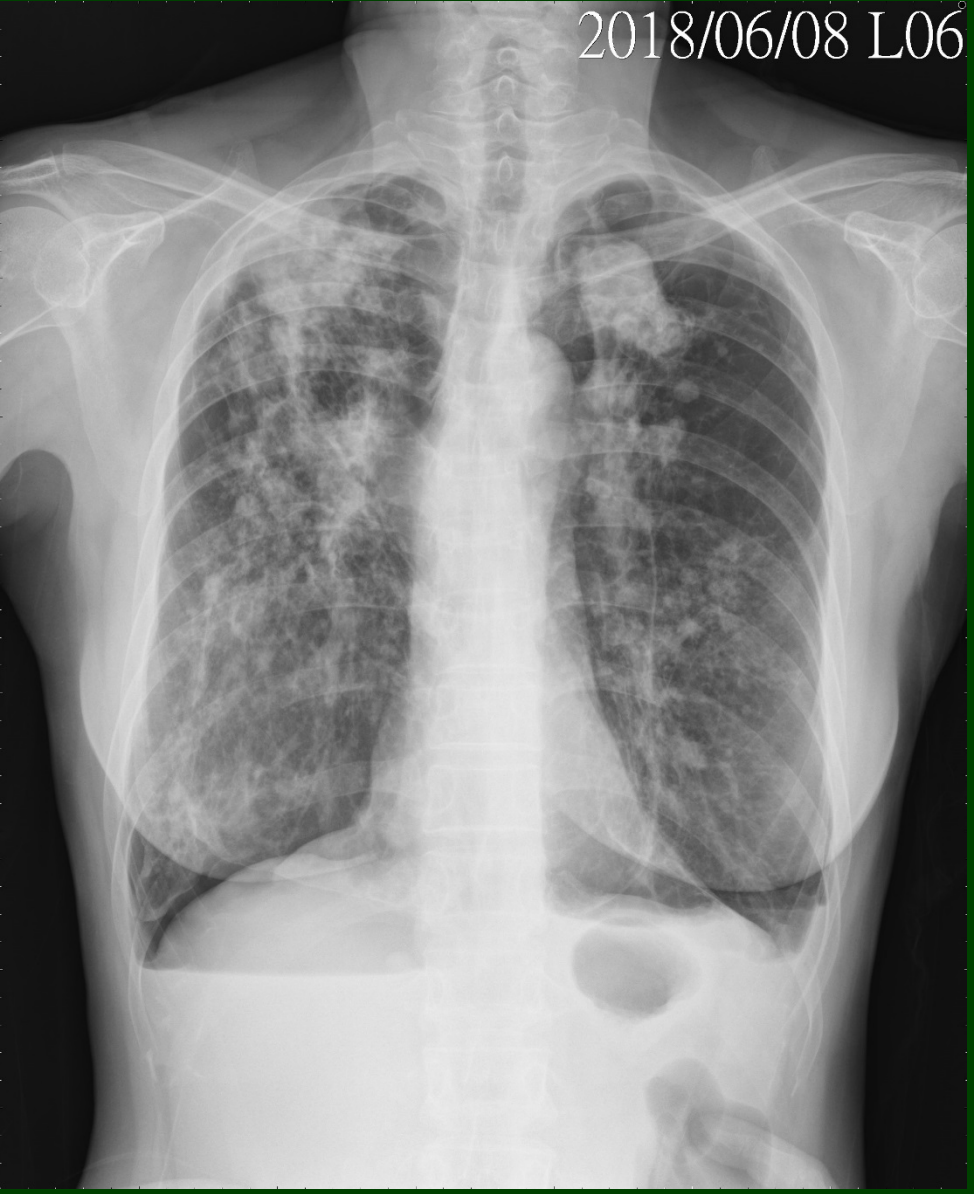
腫塊



浸潤



塌陷



請透視判讀
您認為最可能的診斷?

肺部浸潤
pulmonary infiltrates

何謂肺浸潤 (infiltrates)

定義：

1. 原有的lung markings (bronchovascular bundle)架構不變。
2. 在原有的tracheobronchial trees架構內的肺泡或間質被細胞或液體浸潤。

病理影像　(類型)

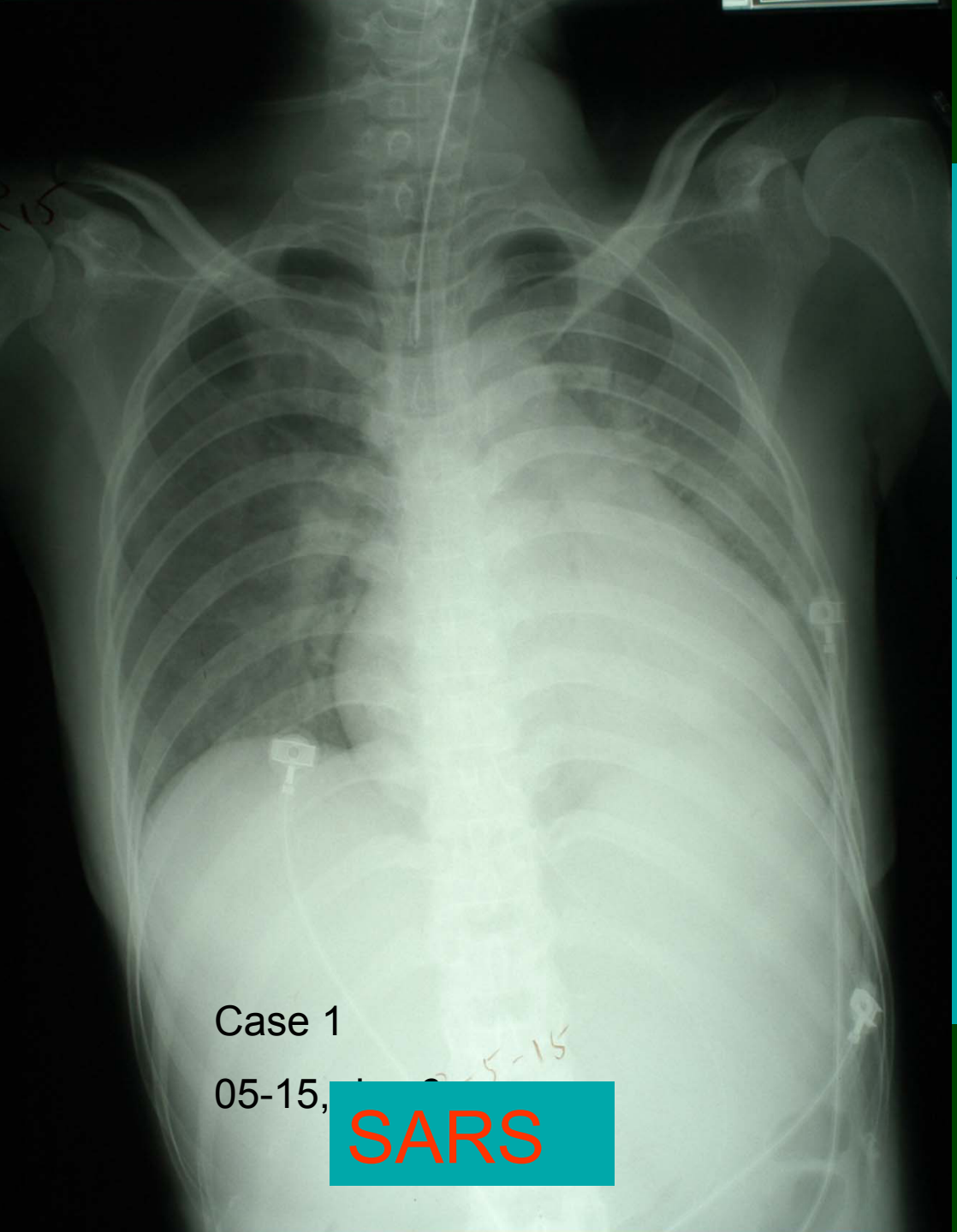
1. 毛玻璃狀斑 Ground Glass Opacities (GGO)

2. 肺實質病變 Consolidation

GGO 毛玻璃狀陰影 (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。



GGO的診斷要點：

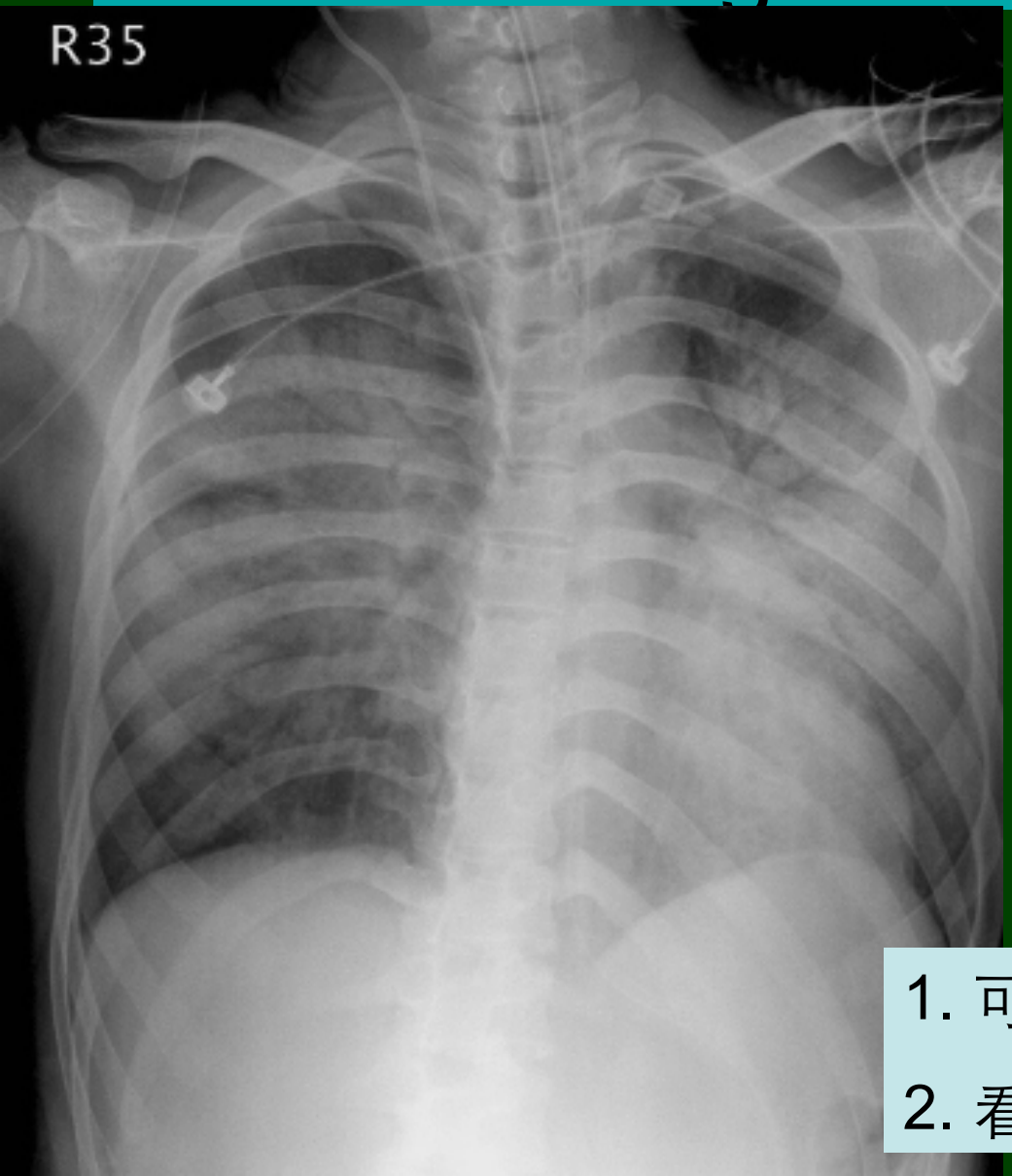
1. 順著broncho-vascular bundle走向的背景呈「白斑」浸潤。
2. 「白斑」背景內仍可分辨血管紋路
3. 「白斑」背景內仍無法分辨出氣道位置(absence of air-bronchogram)

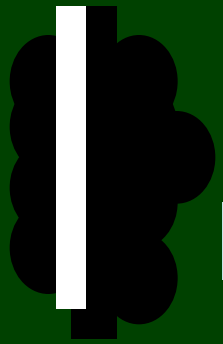
Consolidation
肺實質化

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。(alveolar sac full filled with fluid or cells)

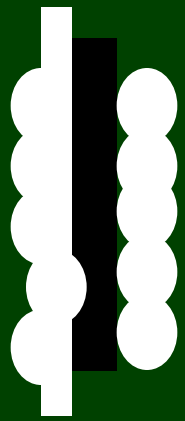
1. 通常表示疾病源自肺泡，透過肺泡間通道傳播，但是傳至肋膜即止。也可以兩個以上肺葉同時發病
2. 影像學：病灶內已無法辨識lung markings，但是有時反而容易顯出air-bronchogram。

Infiltrates
Air-bronchogram & consolidation





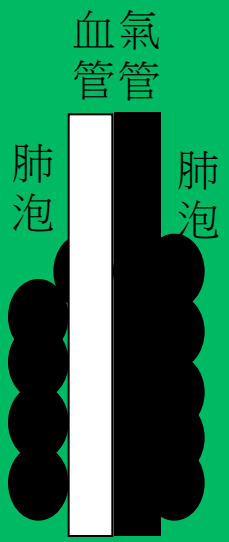
正常肺野



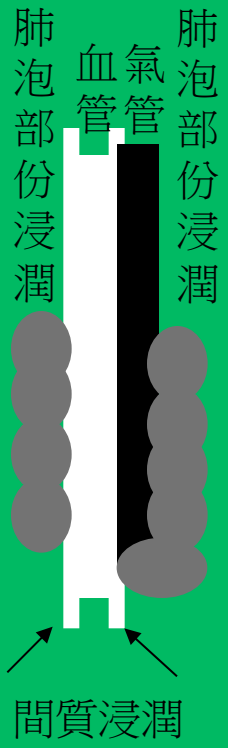
肺實質化時

1. 可以明辨肺動脈嗎？
2. 看得到支氣管氣道空氣嗎？

GGO & Consolidation

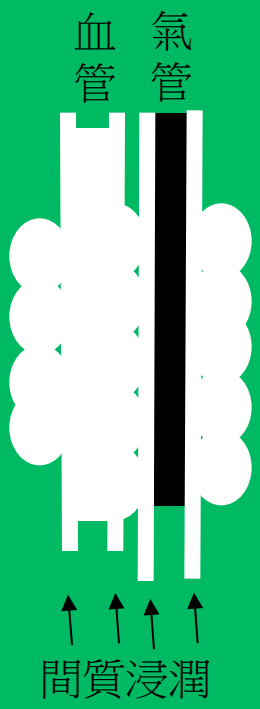


Normal



GGO

肺泡完全浸潤



Consolidation

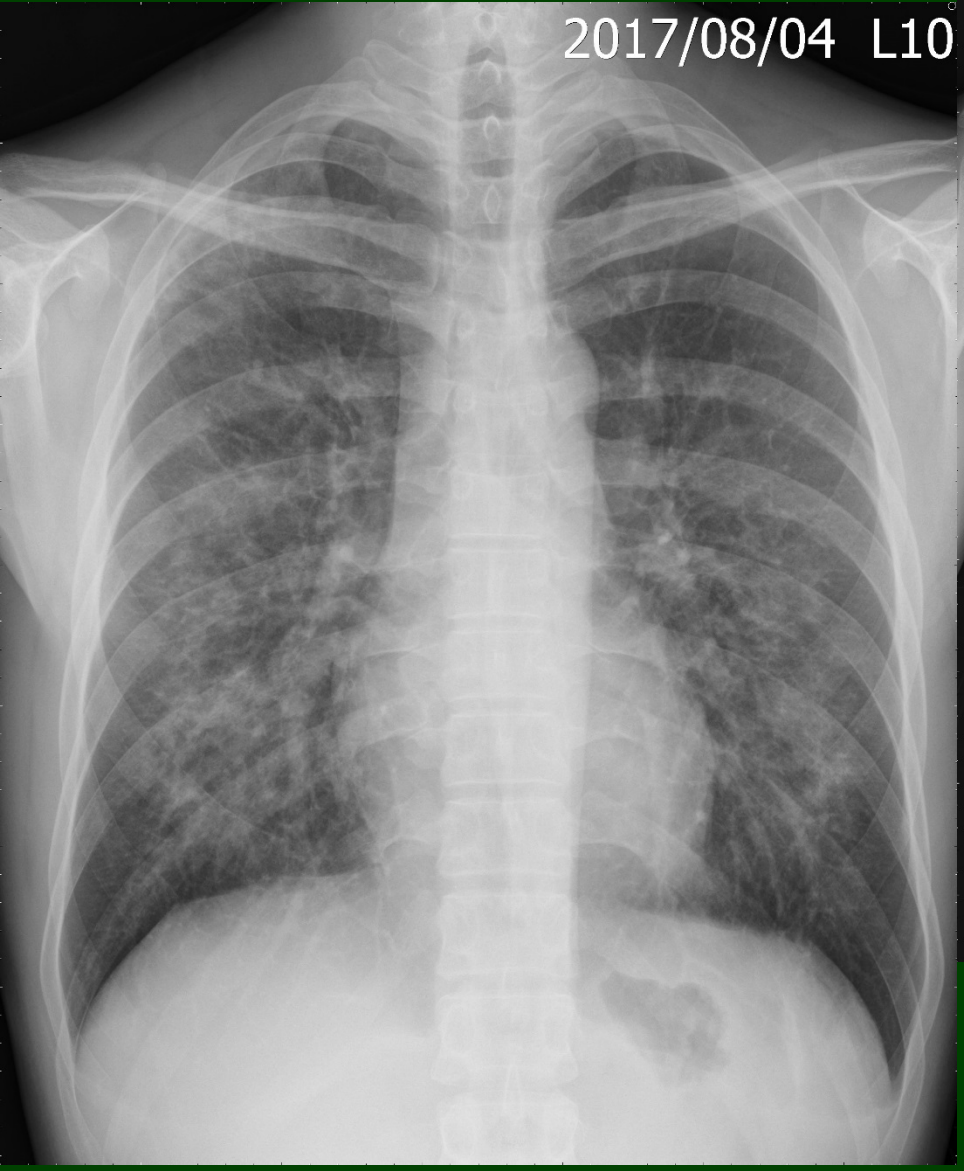
吳錦桐 製作

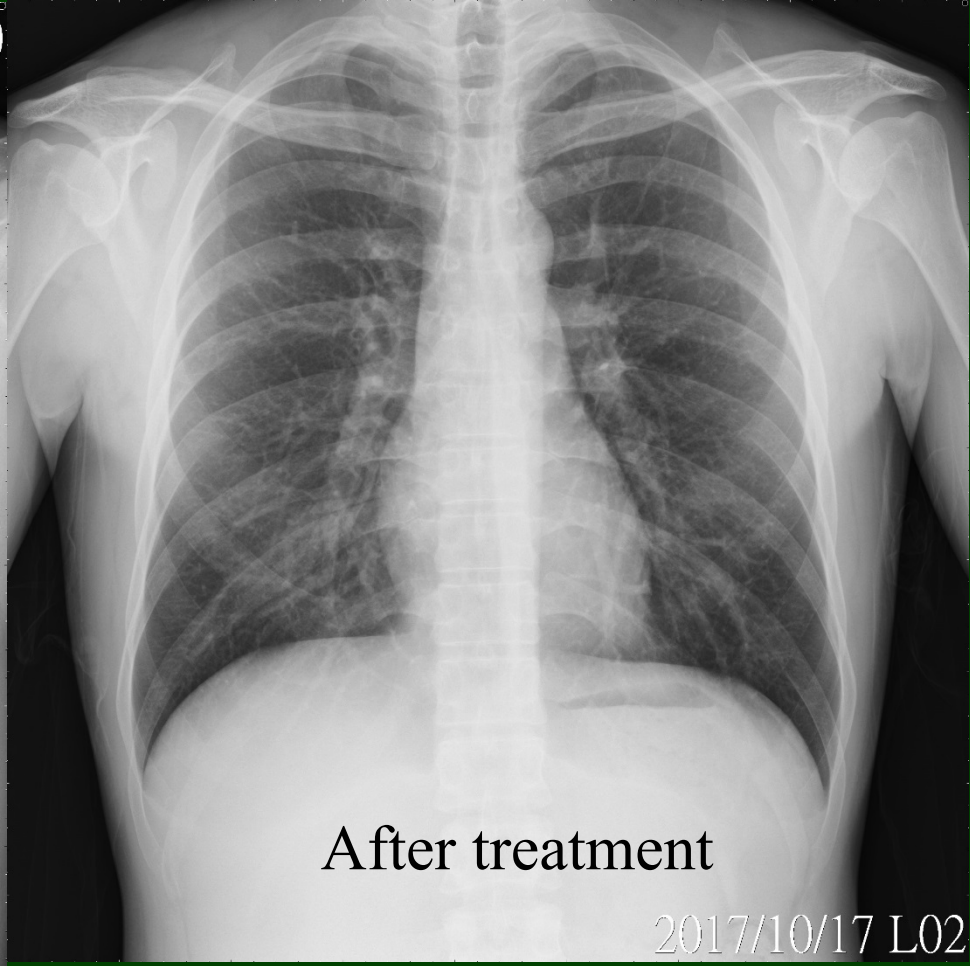
「藏鏡人*」何時現身？

	正常	GGO	Consolidation
肺泡背景	黑幕	白幕	白幕
支氣管氣柱	看不到	看不到	清楚
肺動脈顯影	清楚	清楚	看不到

*「藏鏡人」—氣道內空氣影像 (air-bronchogram)

吳錦桐 製作

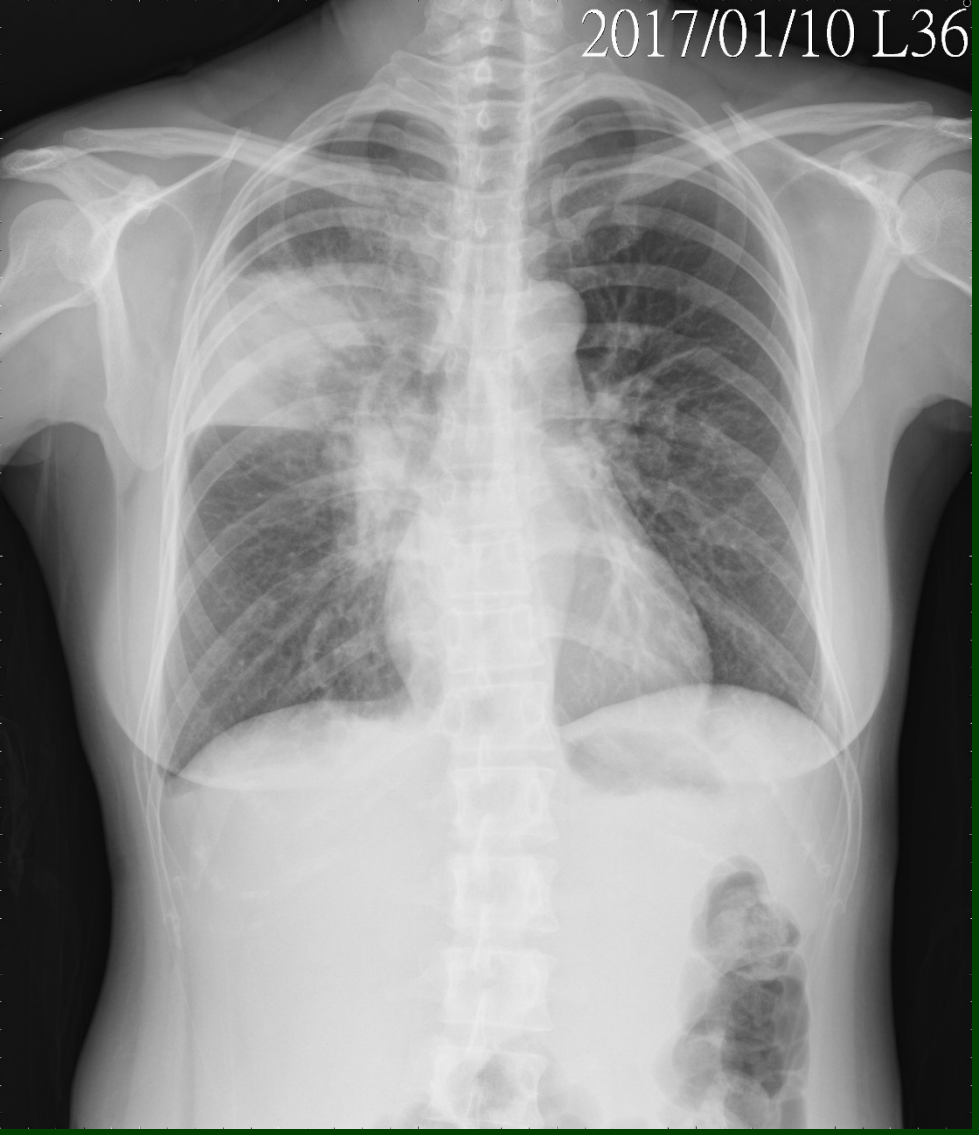


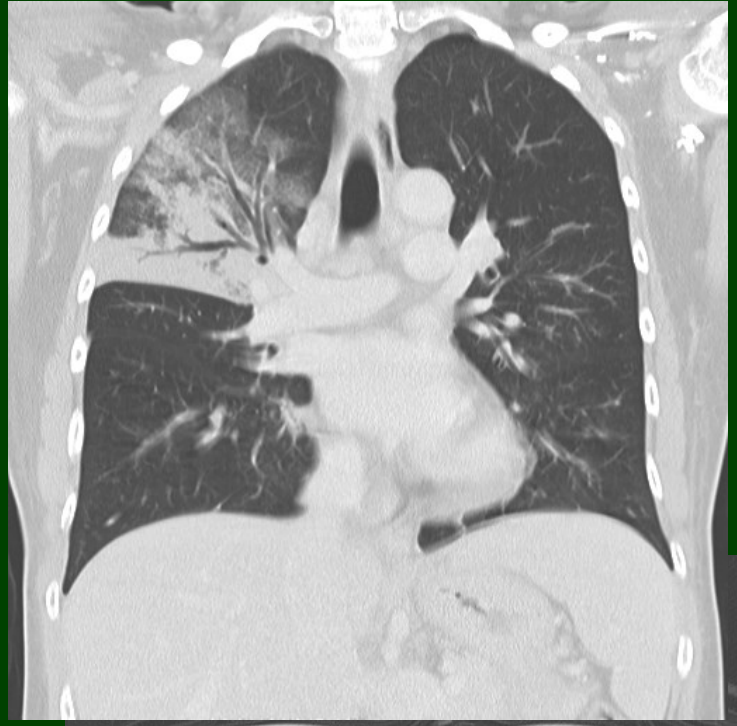


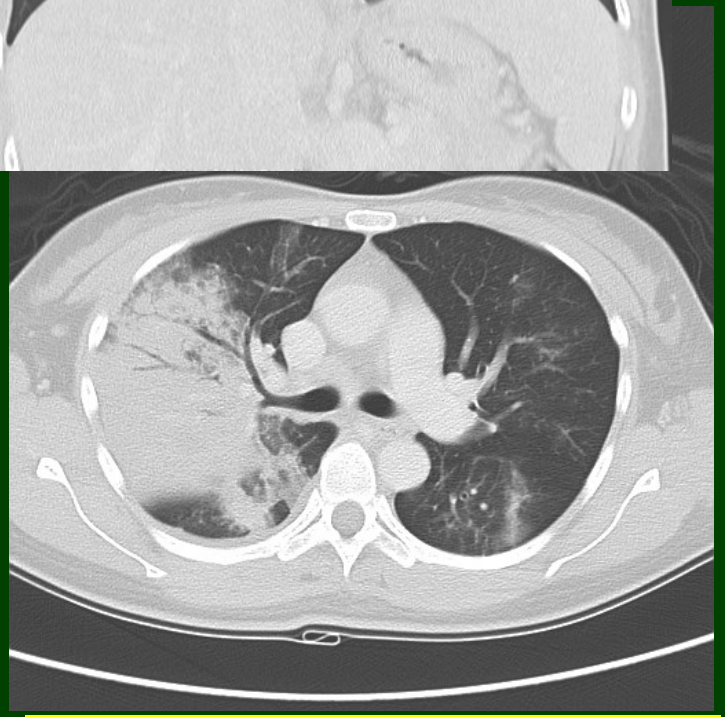
GGO, bilaterally
PJP

GGO:背景白化，但肺紋清晰可見

GGO病理變化表示肺泡尚未完全浸潤







Consolidation: Air-bronchogram
Lobar consolidation: RUL major; RLL minor
Pneumonia

Consolidation病理變化表示
肺泡已經完全浸潤

解剖分布 (類型)

〔可以單邊或雙邊〕:

1. Patches
2. Subsegmental or Segmental
3. Lobar
4. Multiple lobar
5. Diffusely

Segmental and Lobar Opacities

I. Lobar pneumonia
- *Streptococcus pneumoniae*
- *Klebsiella pneumoniae*

II. Lobular pneumonia (bronchopneumonia)
- *Pseudomonas*
- *K. pneumoniae*
- *Bacillus proteus*
- *Escherichia coli*
- *Anarerobes (Bacteroides and clostridia)*
- *Legionella pneumophila*
- *Staphylococcus aureus*
- *Nocardiosis and actinomycosis*
- *S. pneumoniae*
- *Serratia*

III. Nonbacterial pneumonias

•Viruses

•Mycoplasma

•Cryptococcus

•PJP

IV. Aspiration pneumonia

V. Tuberculosis and atypical mycobacteria

VI. Pulmonary embolism
- Hemorrhage and edema
- Infarction

VII. Neoplasms
- Obstructive pneumonia (carcinoma of bronchus)
- Bronchioloalveolar cell carcinoma
- Lymphoma

VIII. Atelectasis

XI. Mitral regurgitation with pulmonary edema localized to the right upper lobe

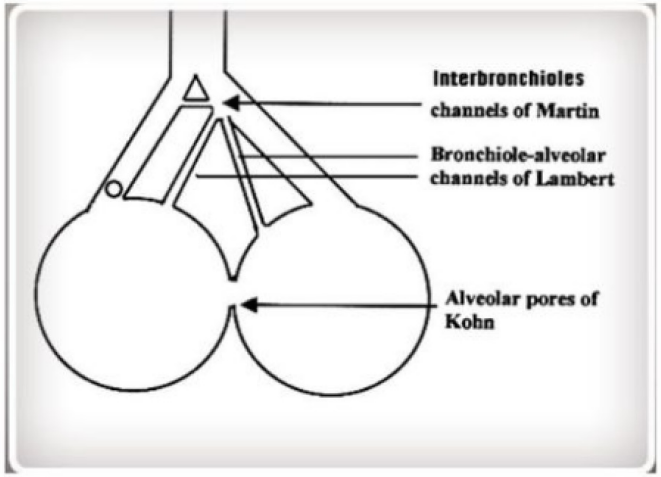
X. Lung torsionJames C. Reed

James C. Reed "CHEST RADIOLOGY" Plain Film Patterns and Differential Diagnoses Sixth Edition, p206

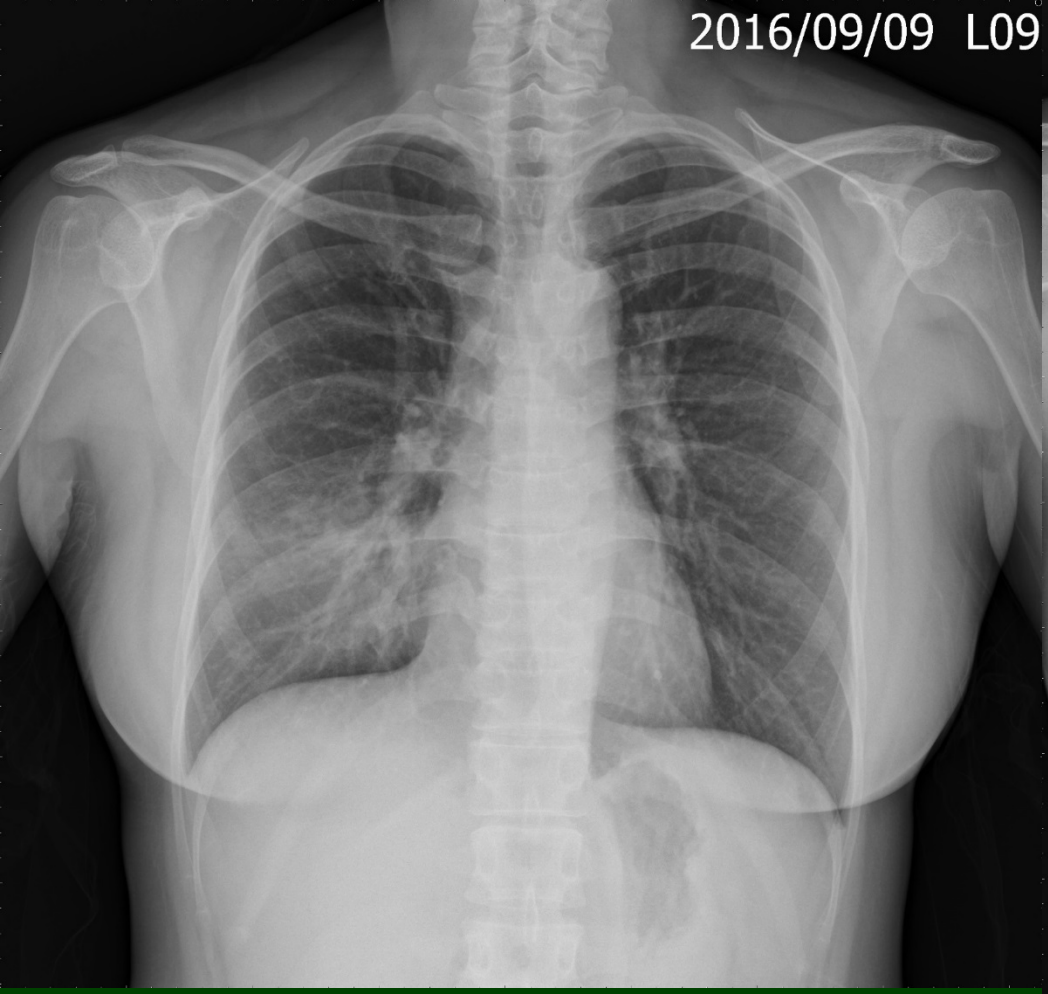
Increasing Airflow and Collateral Ventilation Pathways

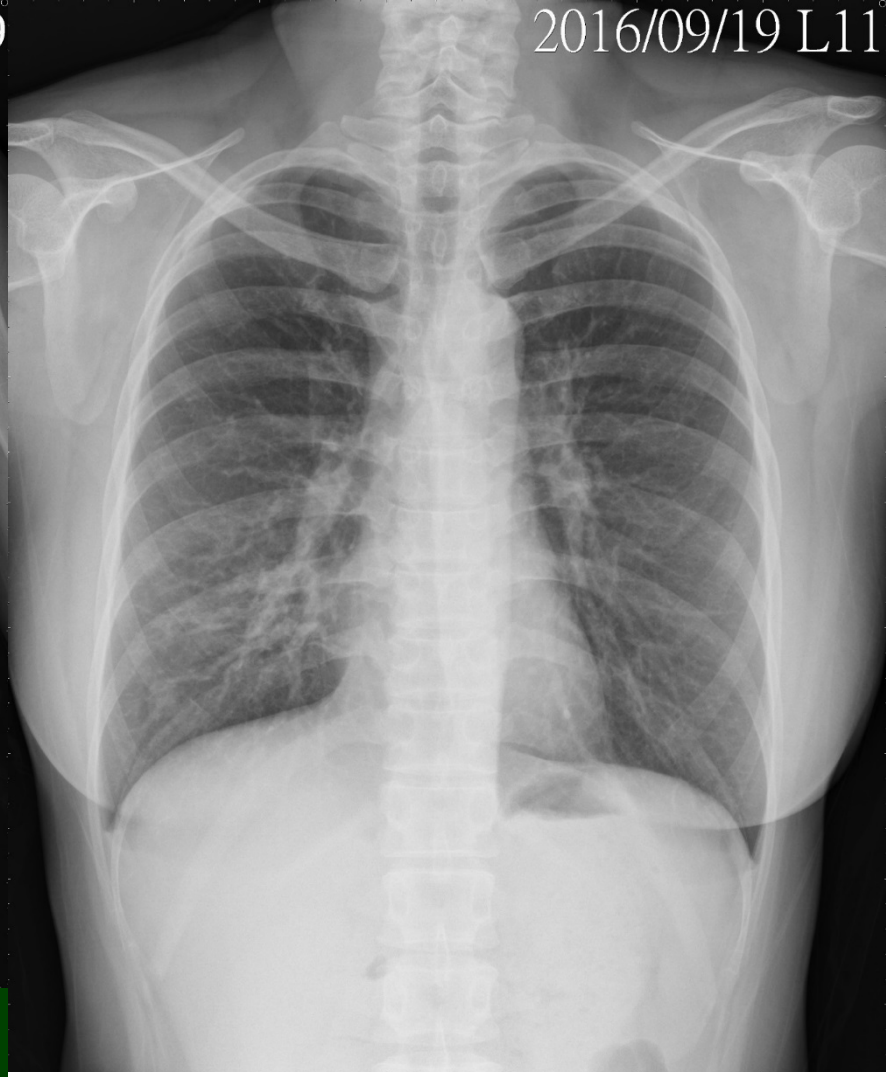
Air movement between adjacent lung segments

- **Pores of Kohn**
  - Interalveolar
- **Canals of Lambert**
  - Broncho-alveolar
- **Canals of Martin**
  - Interbronchial



Children's MINNESOTA





After antibiotics treatment

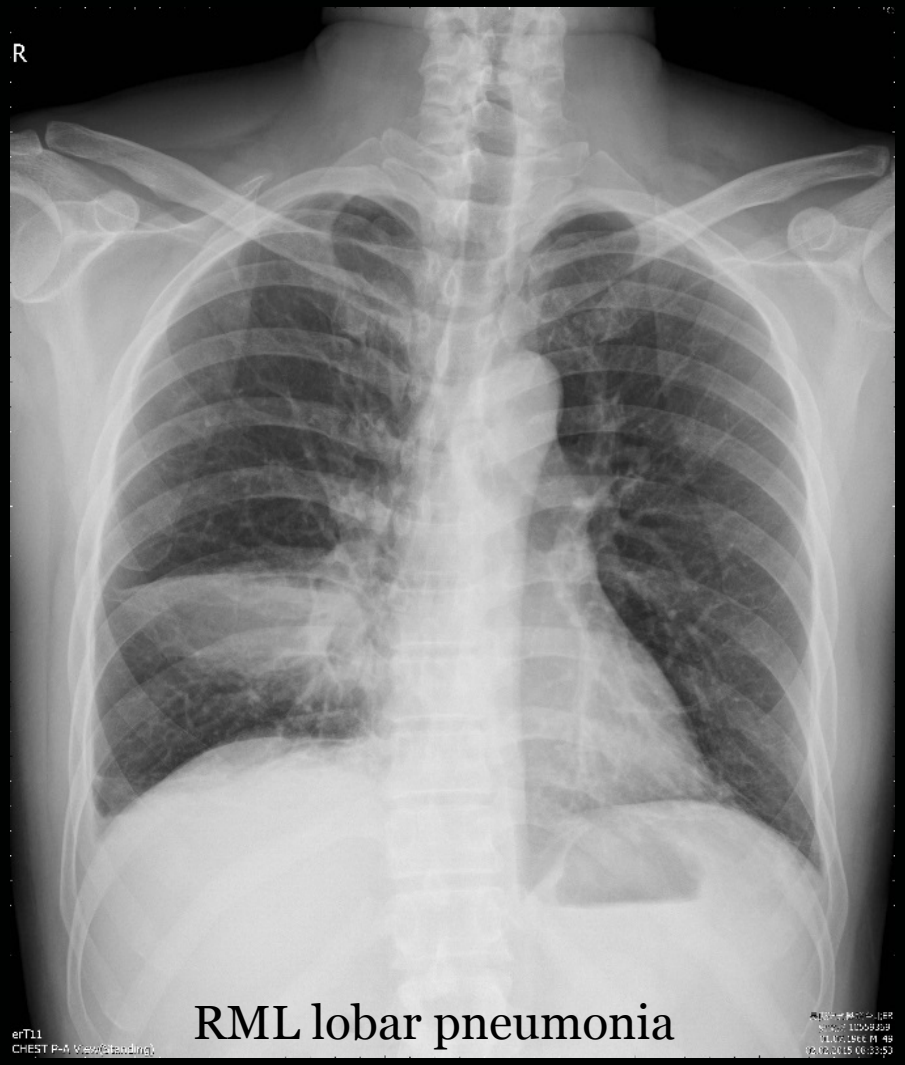
Fever and productive cough for days

Urine Legionella Ag (-), S. pneumonia Ag (+)

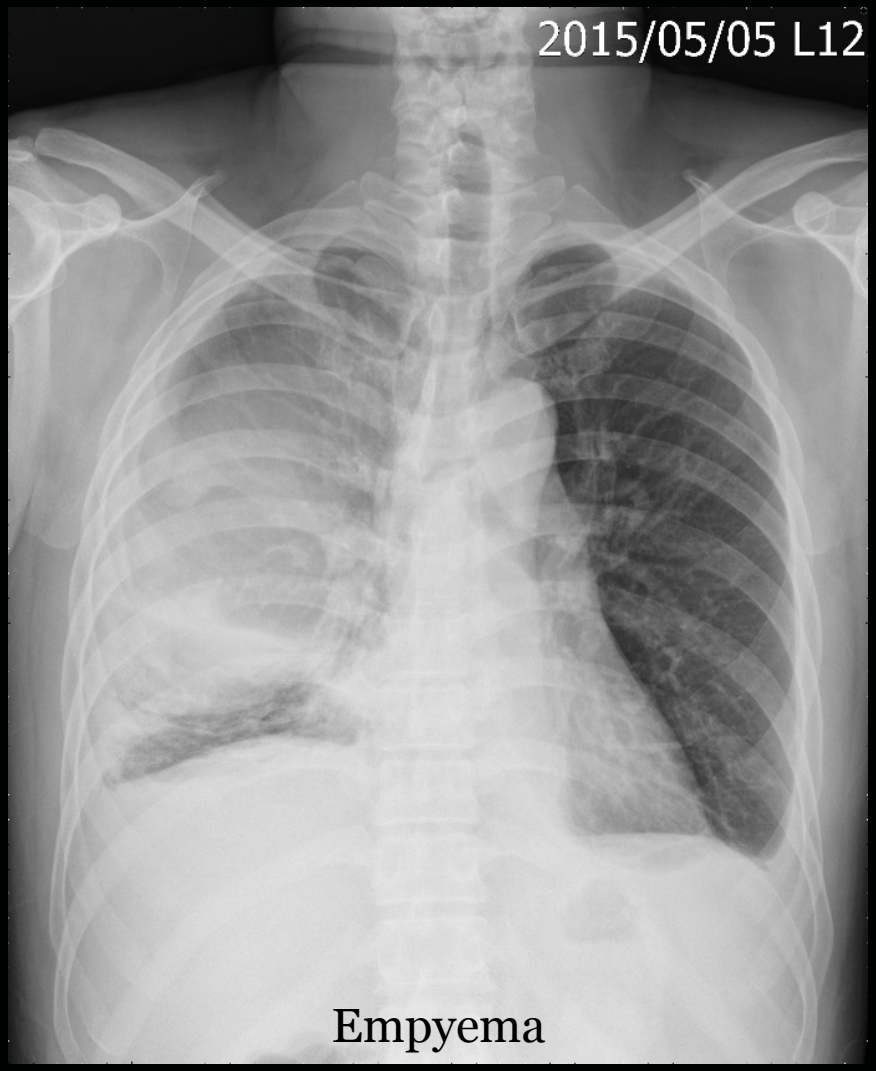
Blood culture isolated S. pneumoniae

Invasive Pneumococcus disease (IPD)

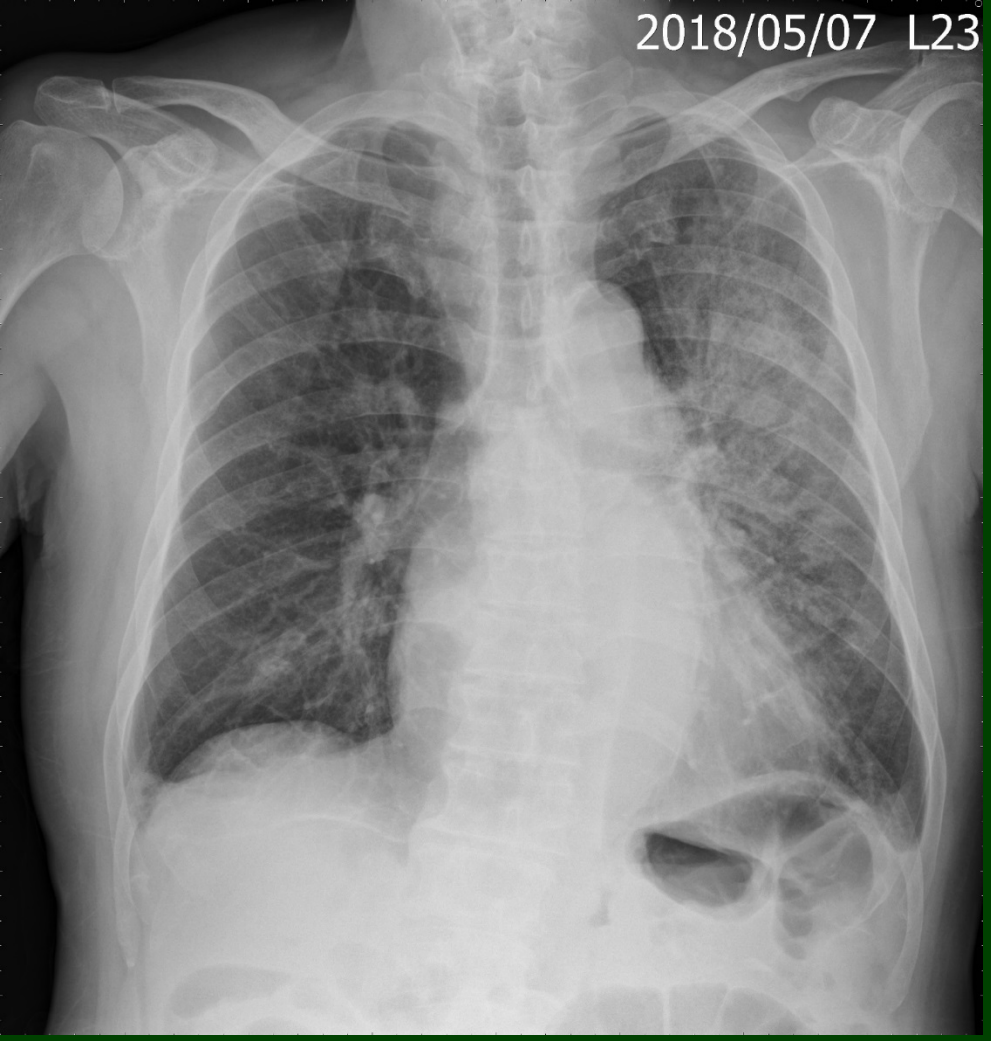
侵襲性肺炎鏈球菌疾病 Invasive Pneumococcus Disease (IPD)

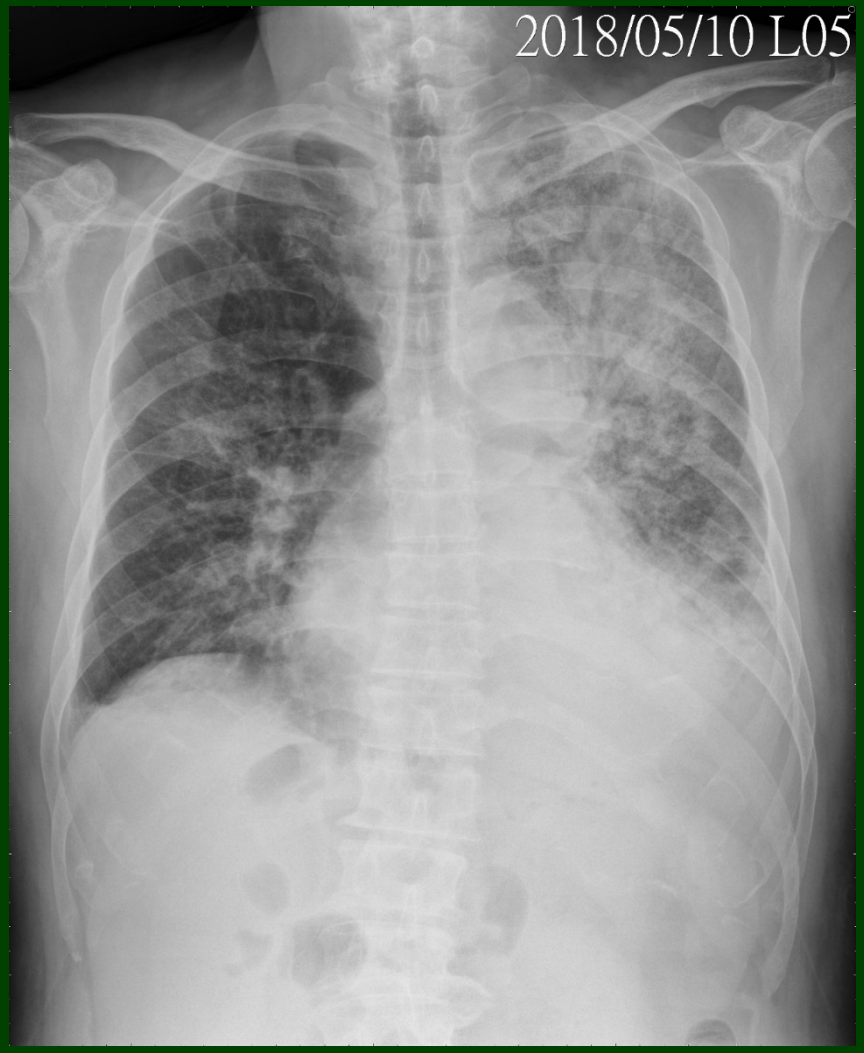


RML lobar pneumonia



Empyema

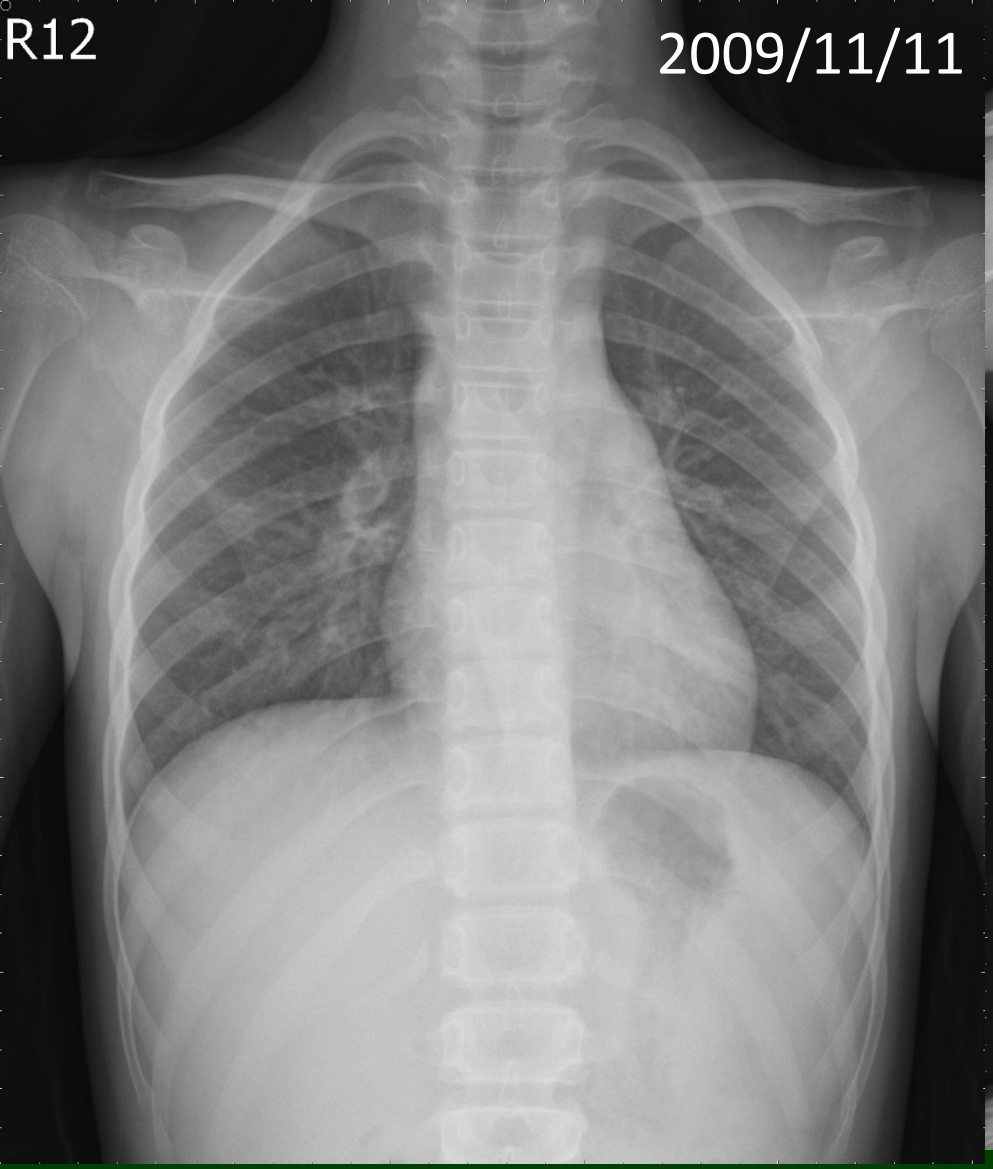


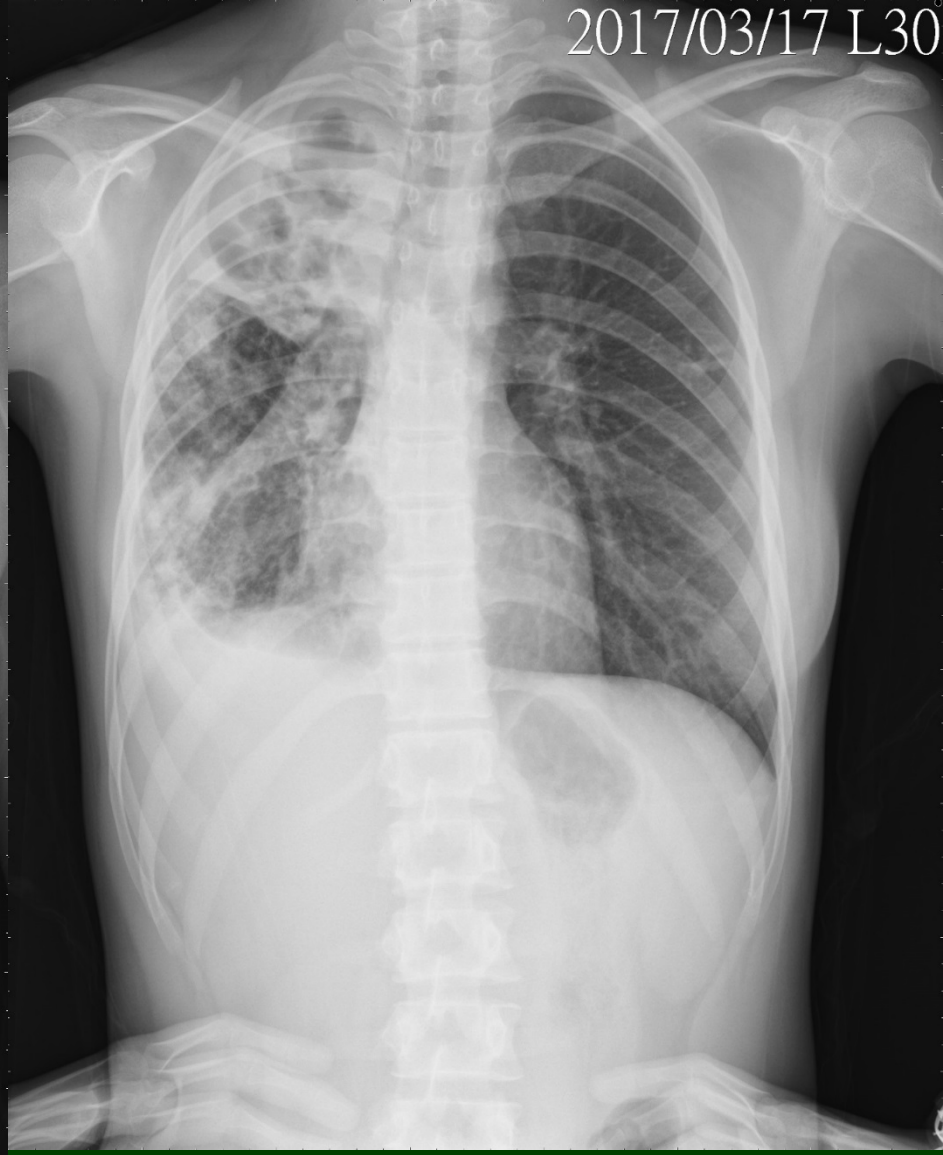


Consolidation, LUL (air-bronchogram)

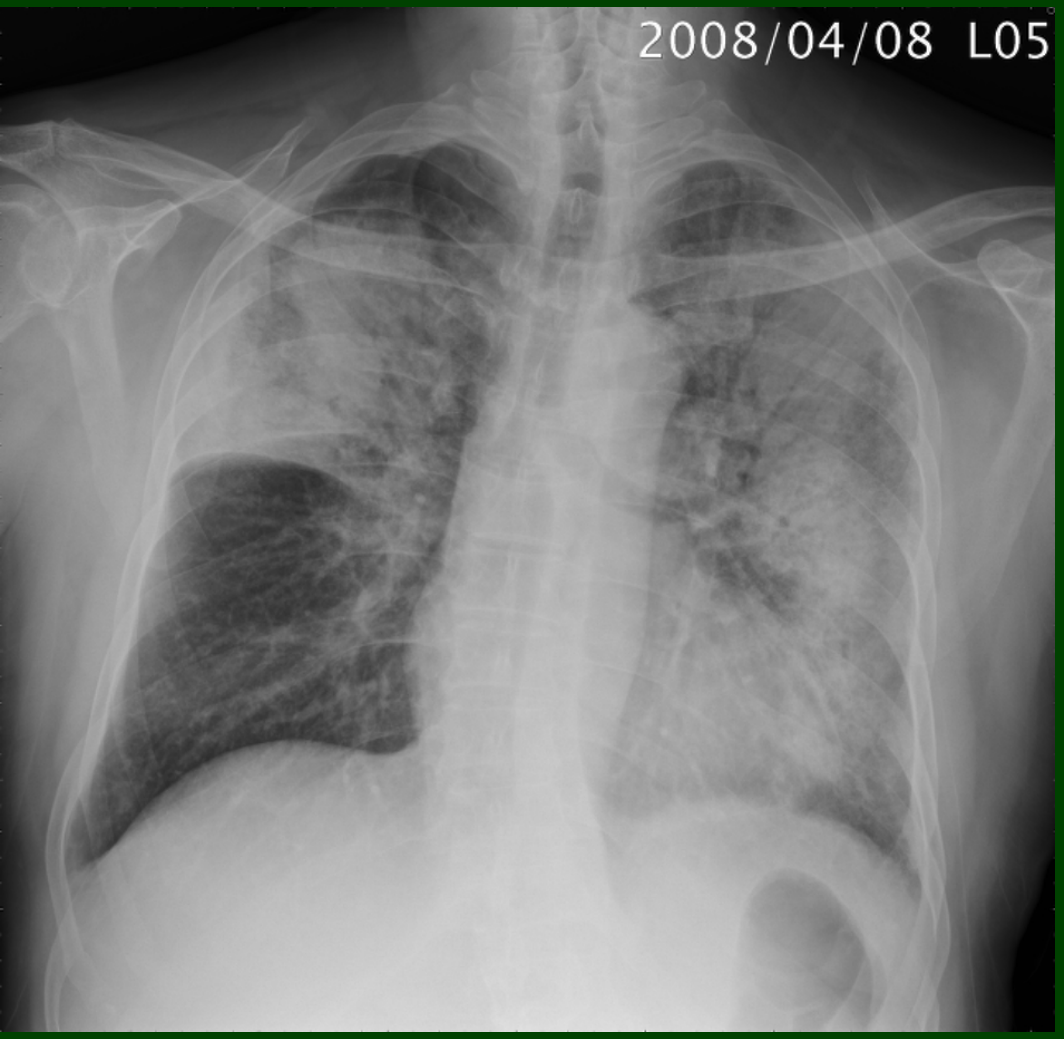
您要不要猜猜看，可能的診斷?

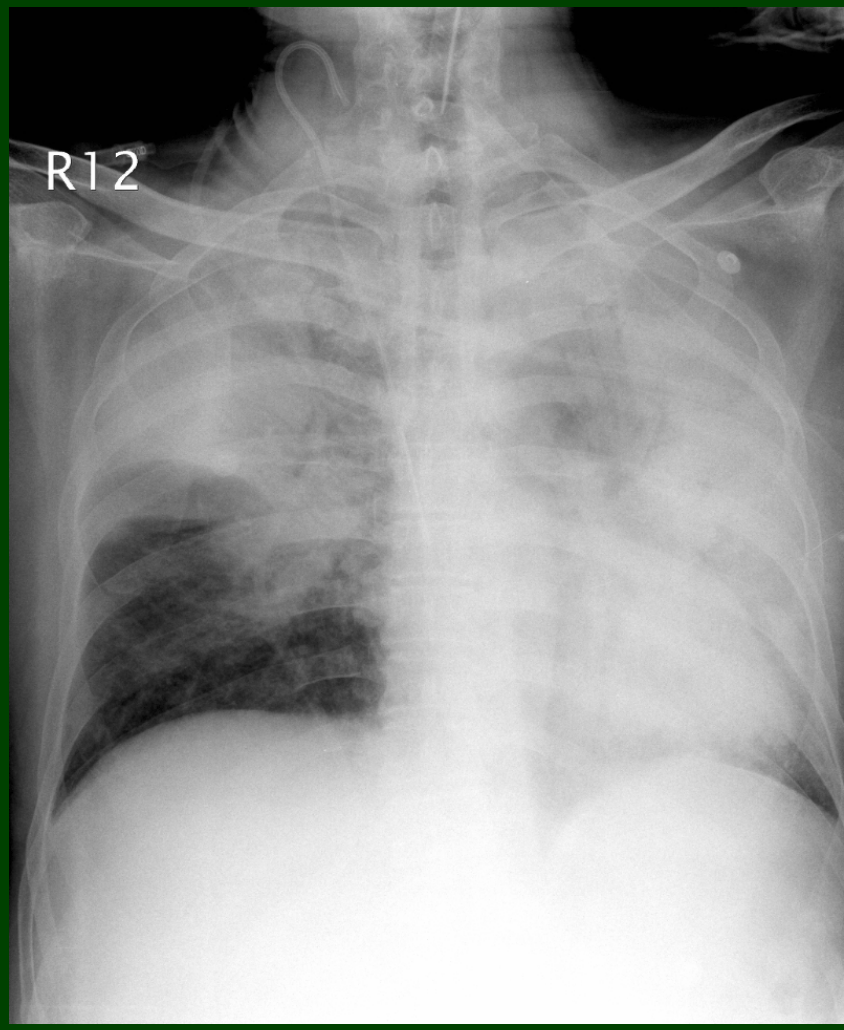
2018/05/07(血漿) Na=125 K=4.1 Glu=197 GOT=101 Creatinine=1.19 Lactic acid=4.2
2018/05/07(血液) Hb=16.0 WBC=13260 Seg.=91.8 % PLT=145k
2018/05/07(鼻咽部拭子) flu (-)
2018/05/08(痰) RBC=>100/LPF Ep. Cell=16-20/LPF WBC=>100/LPF





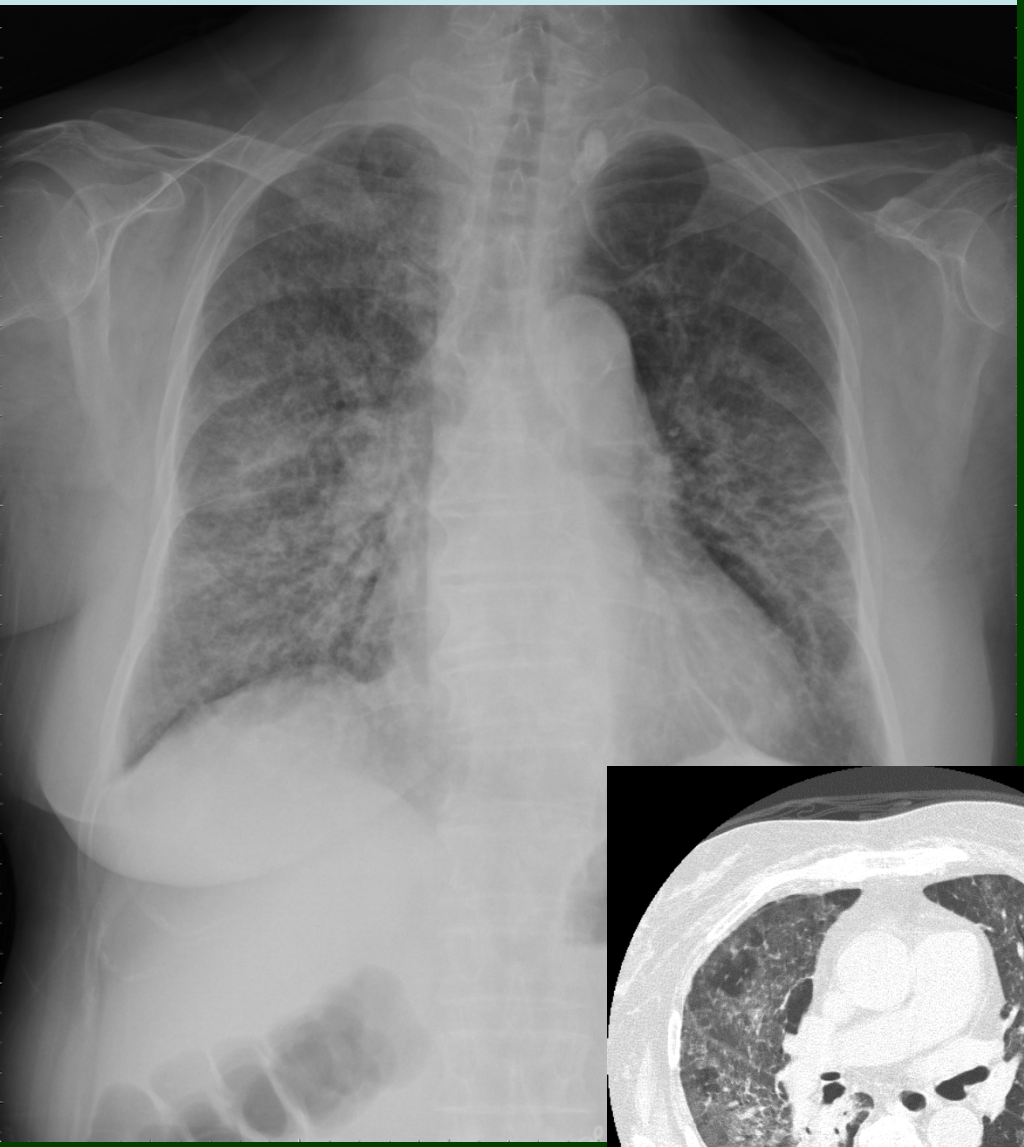
猜猜我是誰?

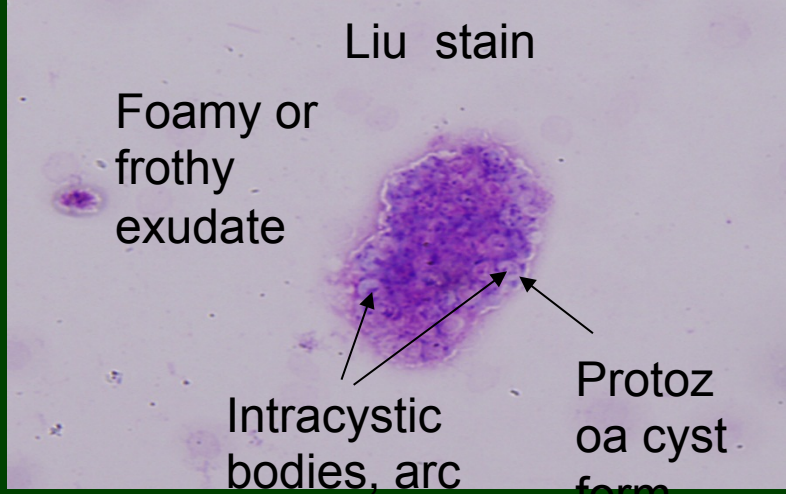


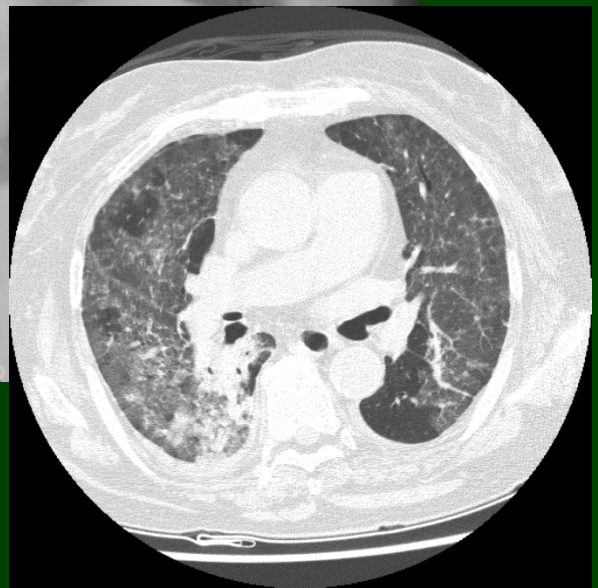


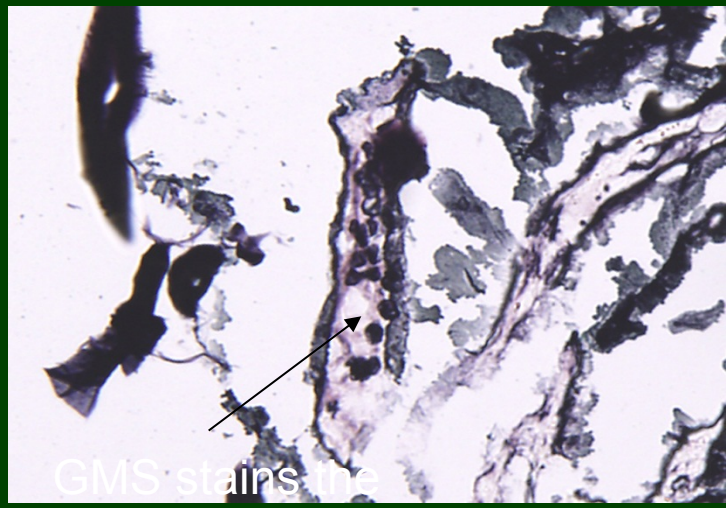
Legionella

Recipient of kidney transplant





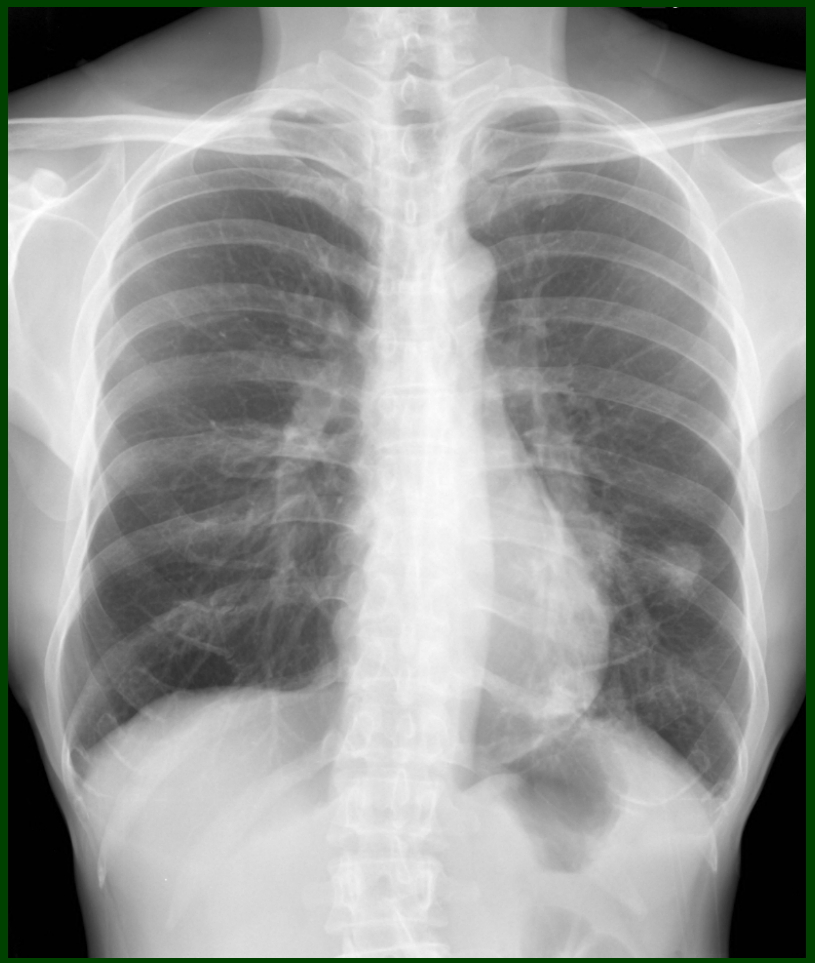


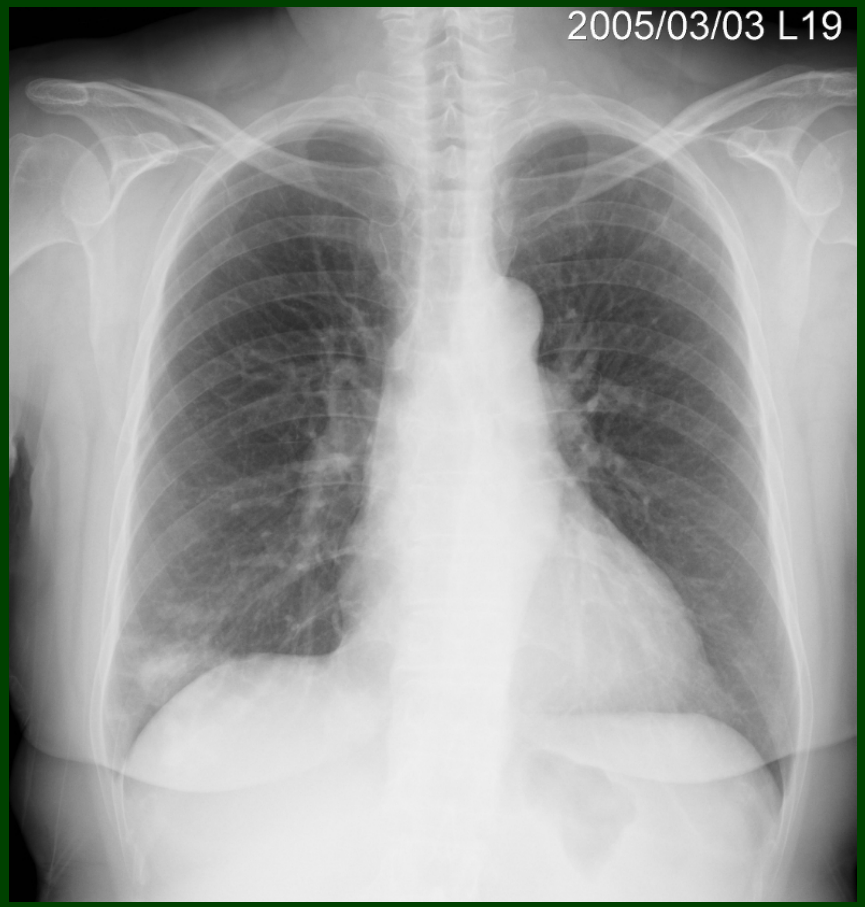


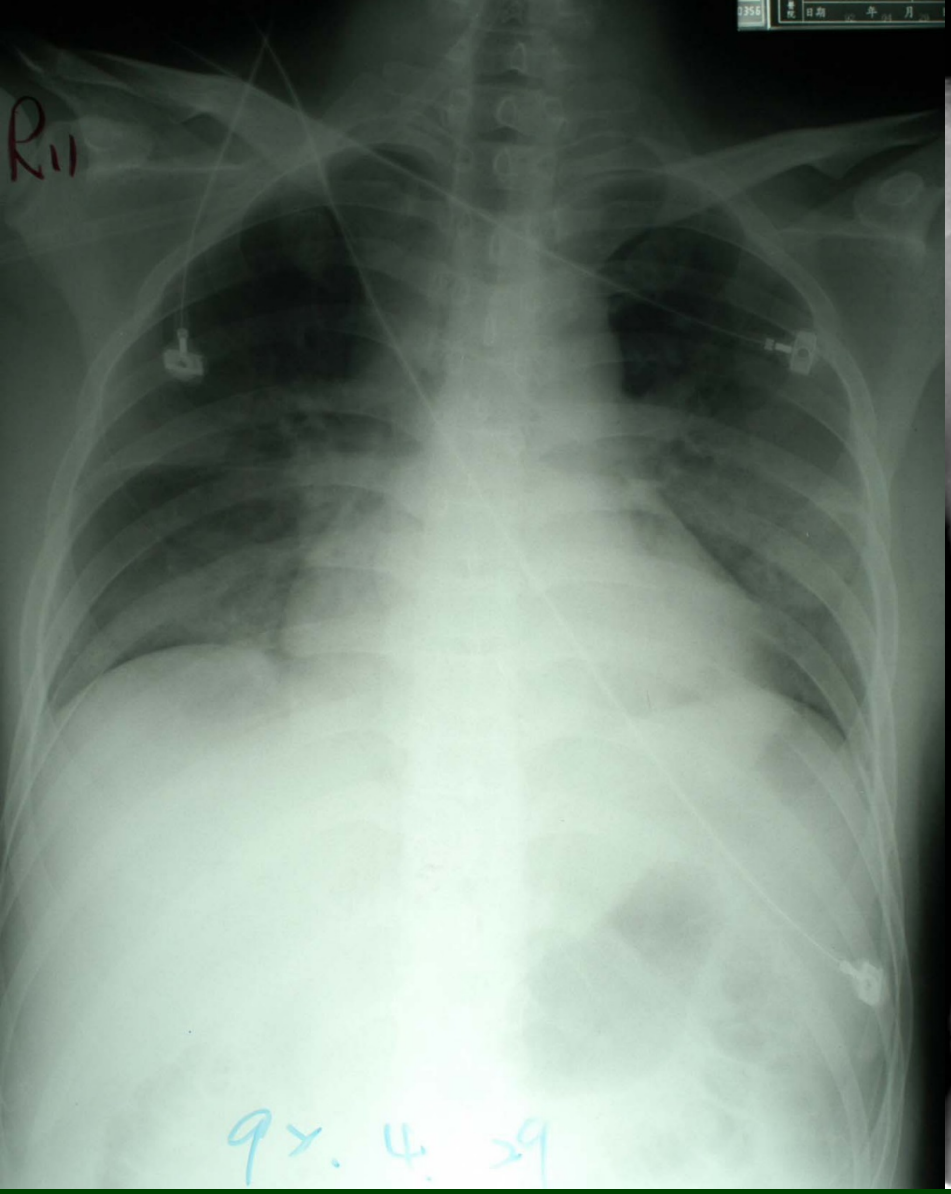
GMS stains the cyst wall, which resembles collapsed ping-pong balls

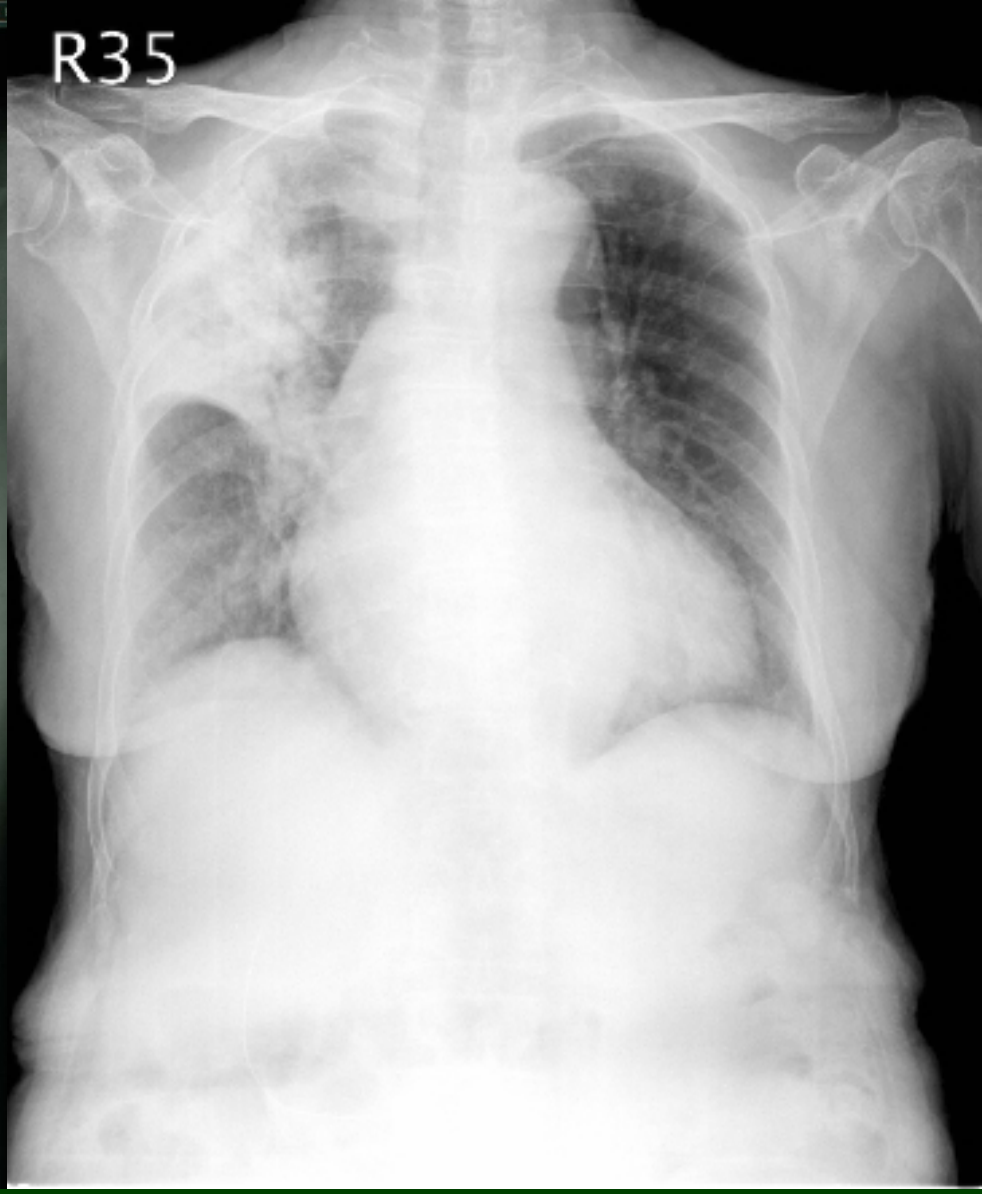
PJP

發炎性疾病—腫塊形狀出現
Cryptococcosis



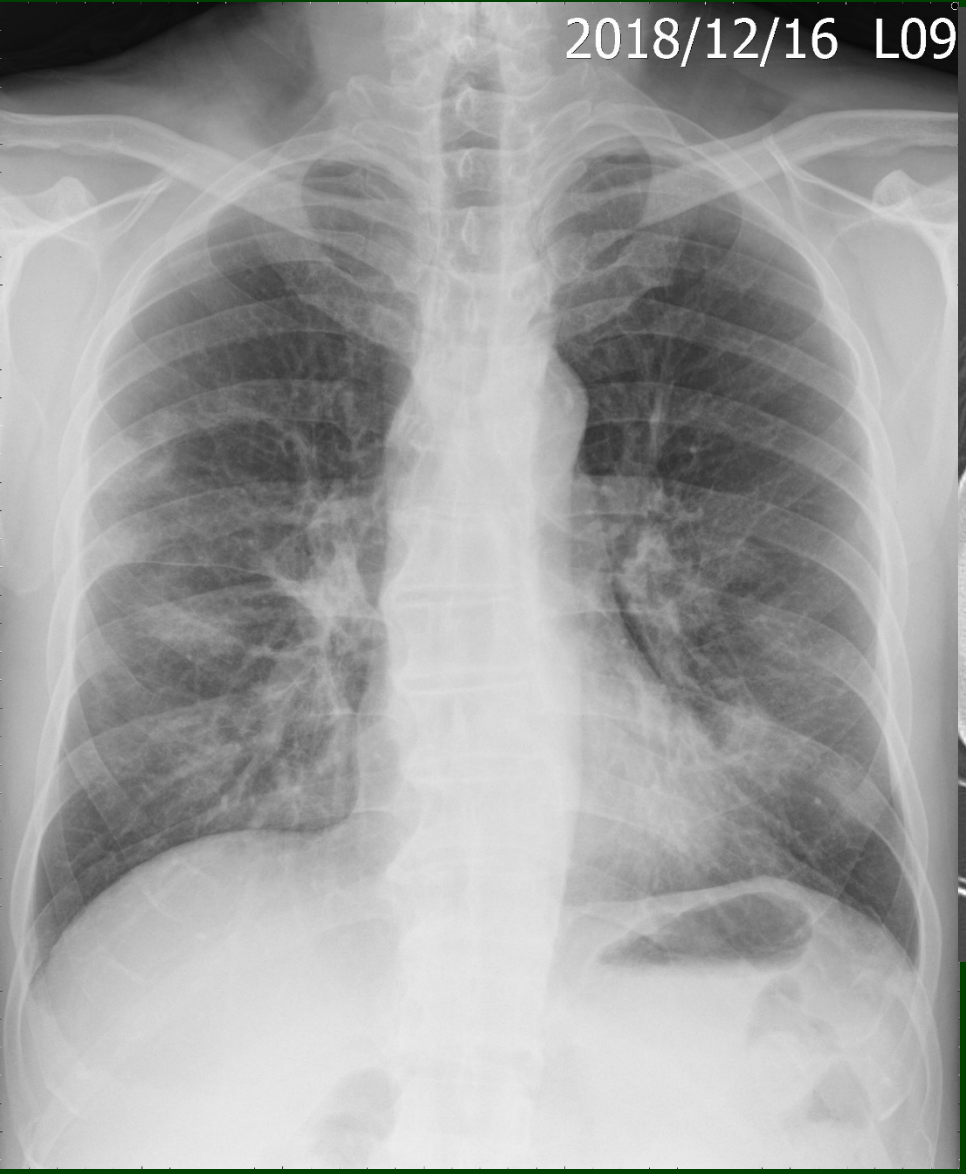


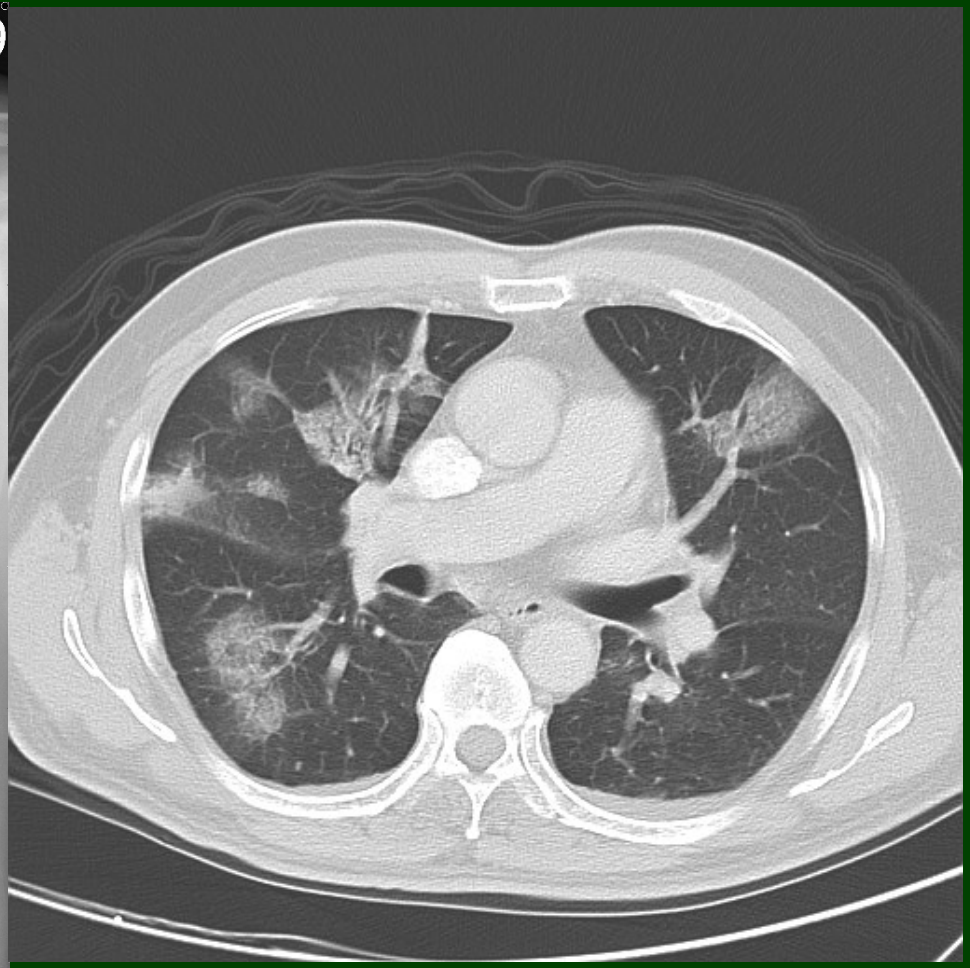




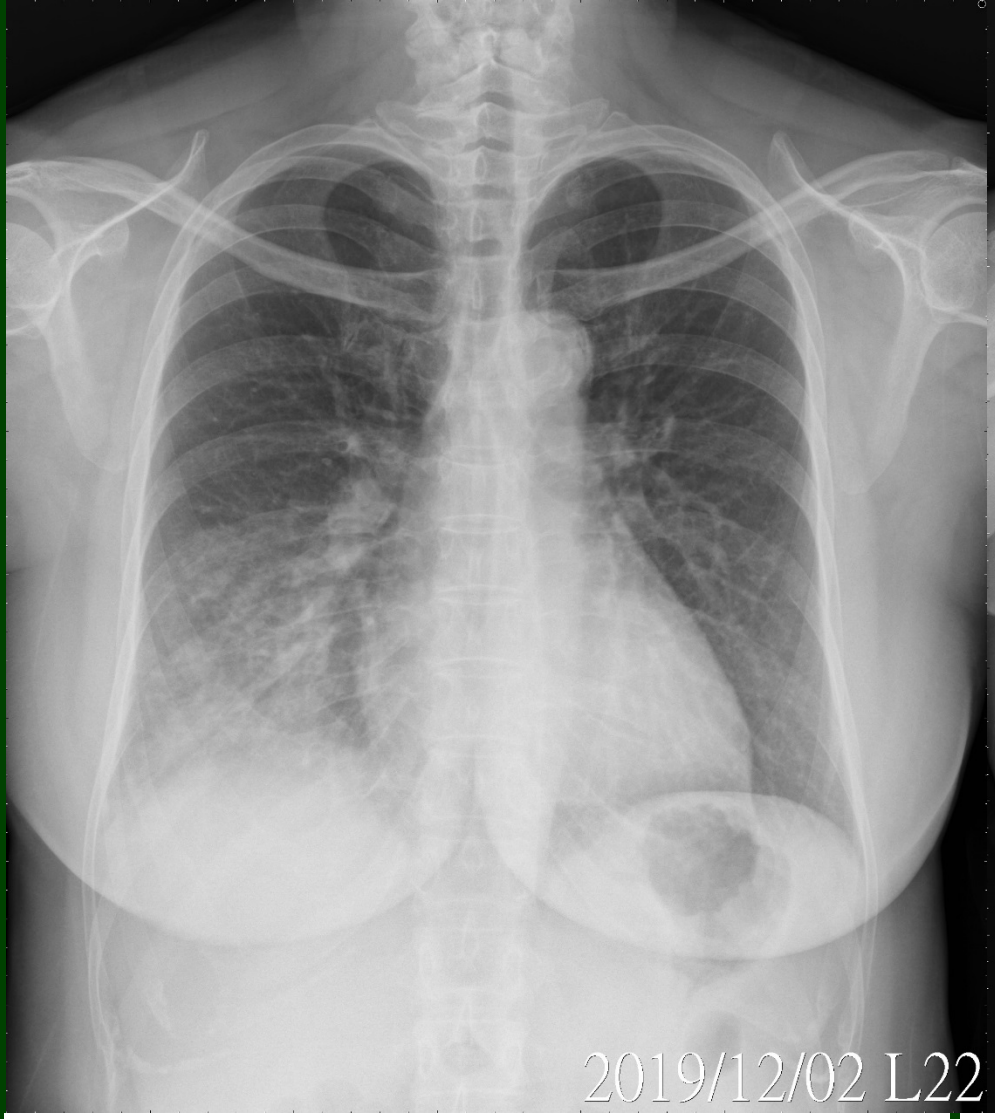
Patches

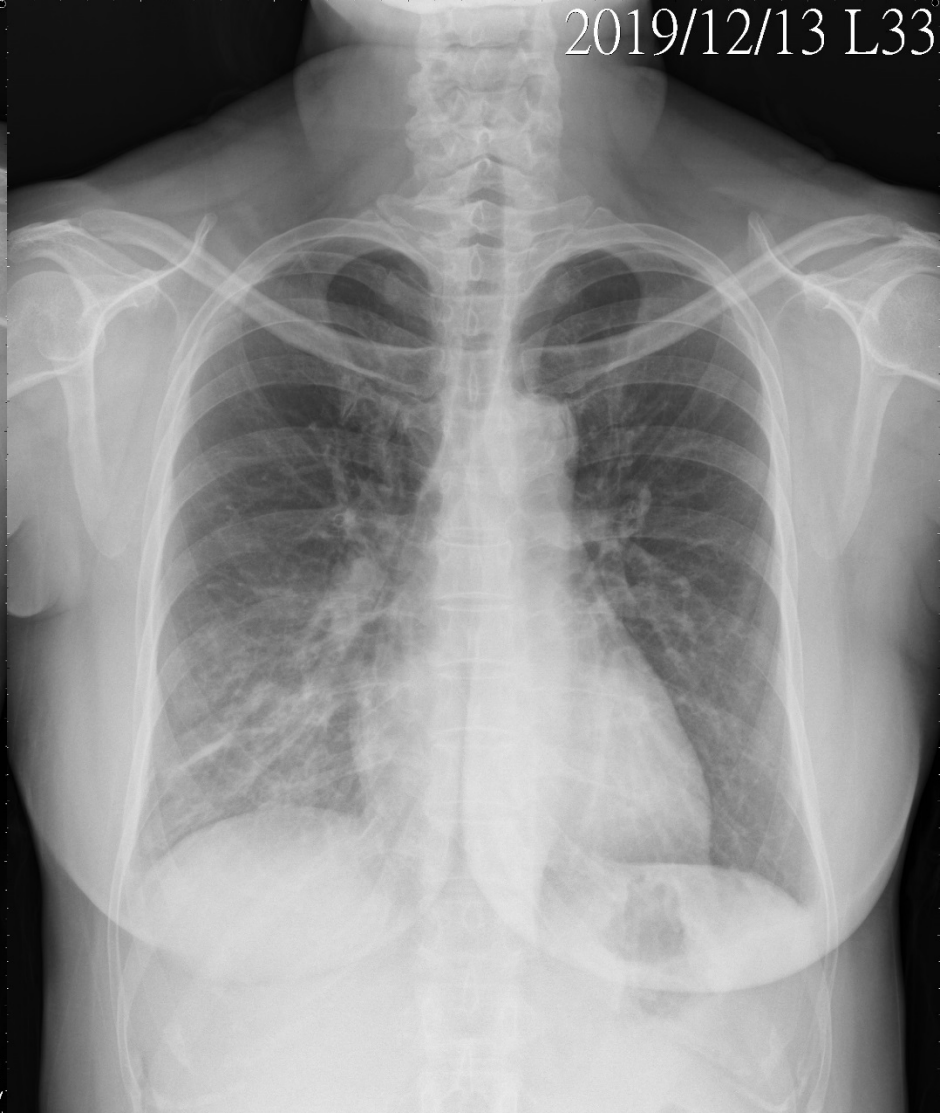
Lobar





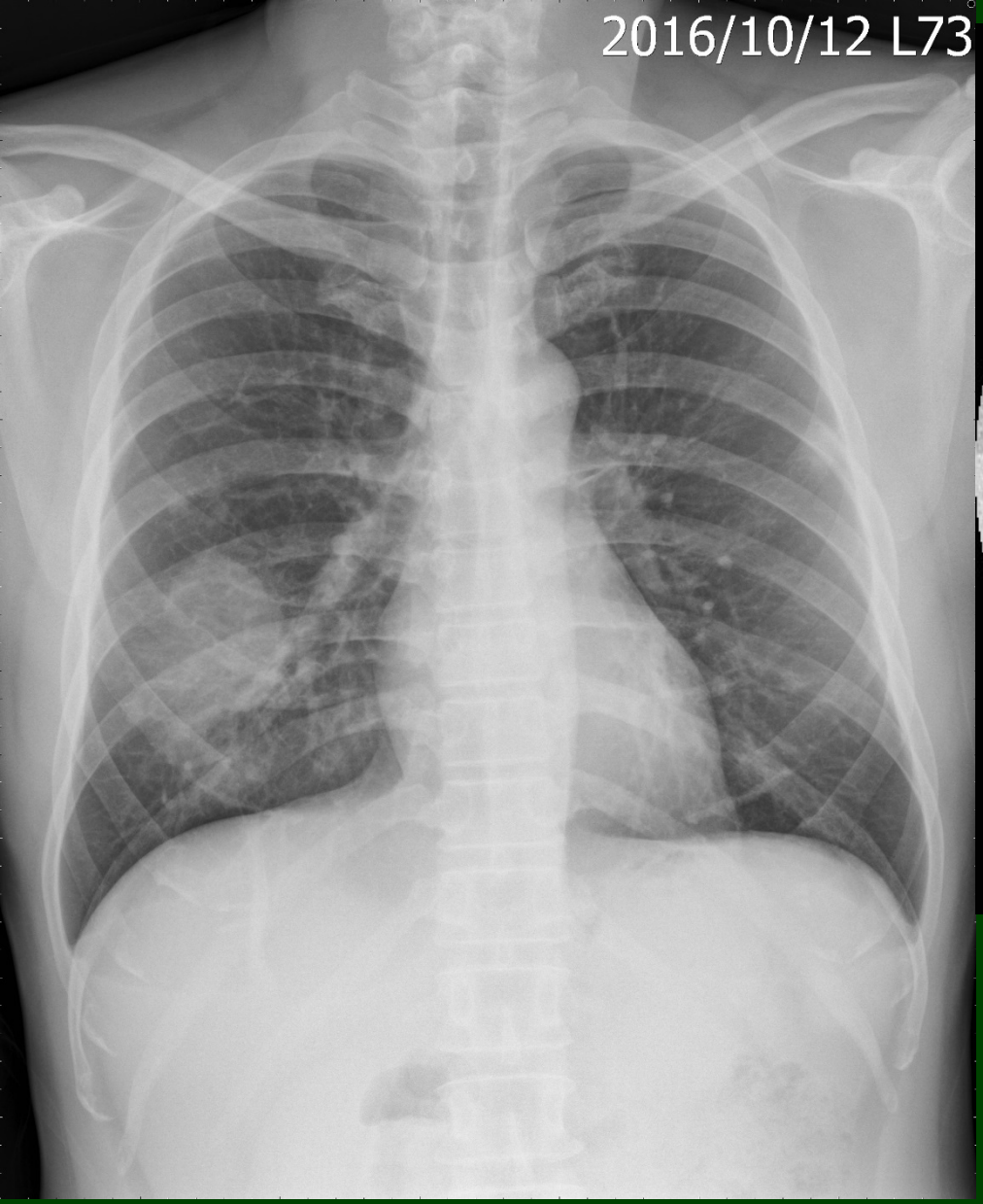
Multiple segmental/subsegmental pathes or consolidation

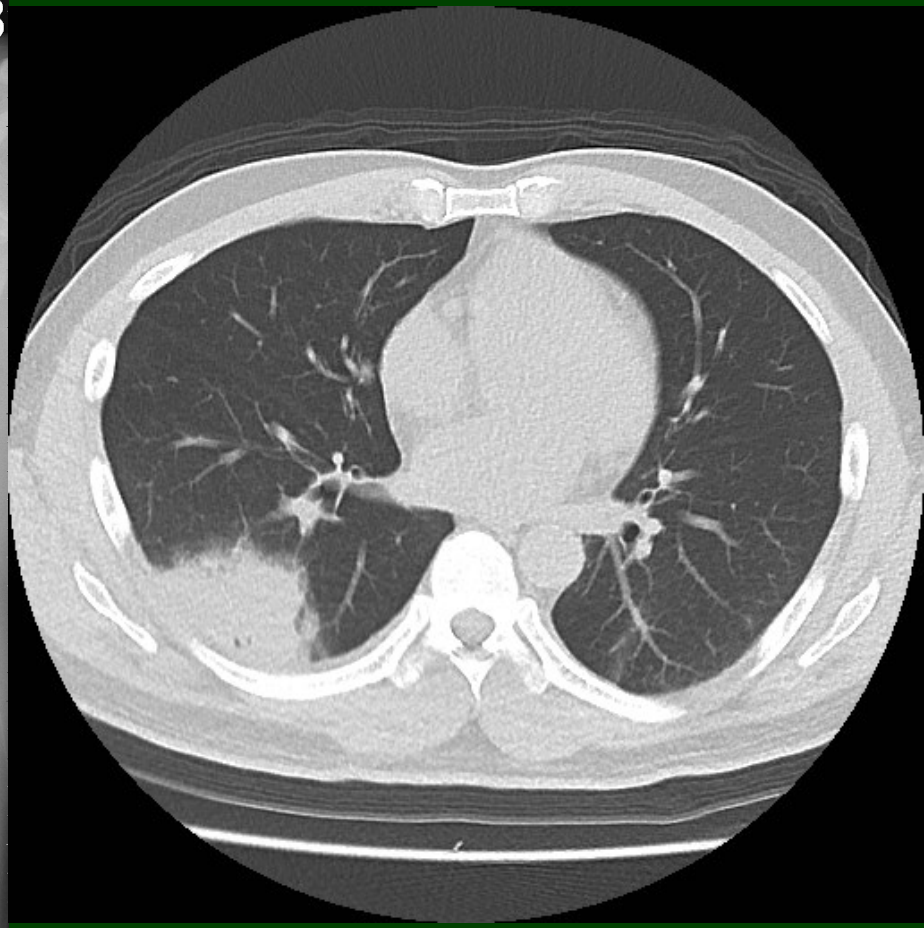




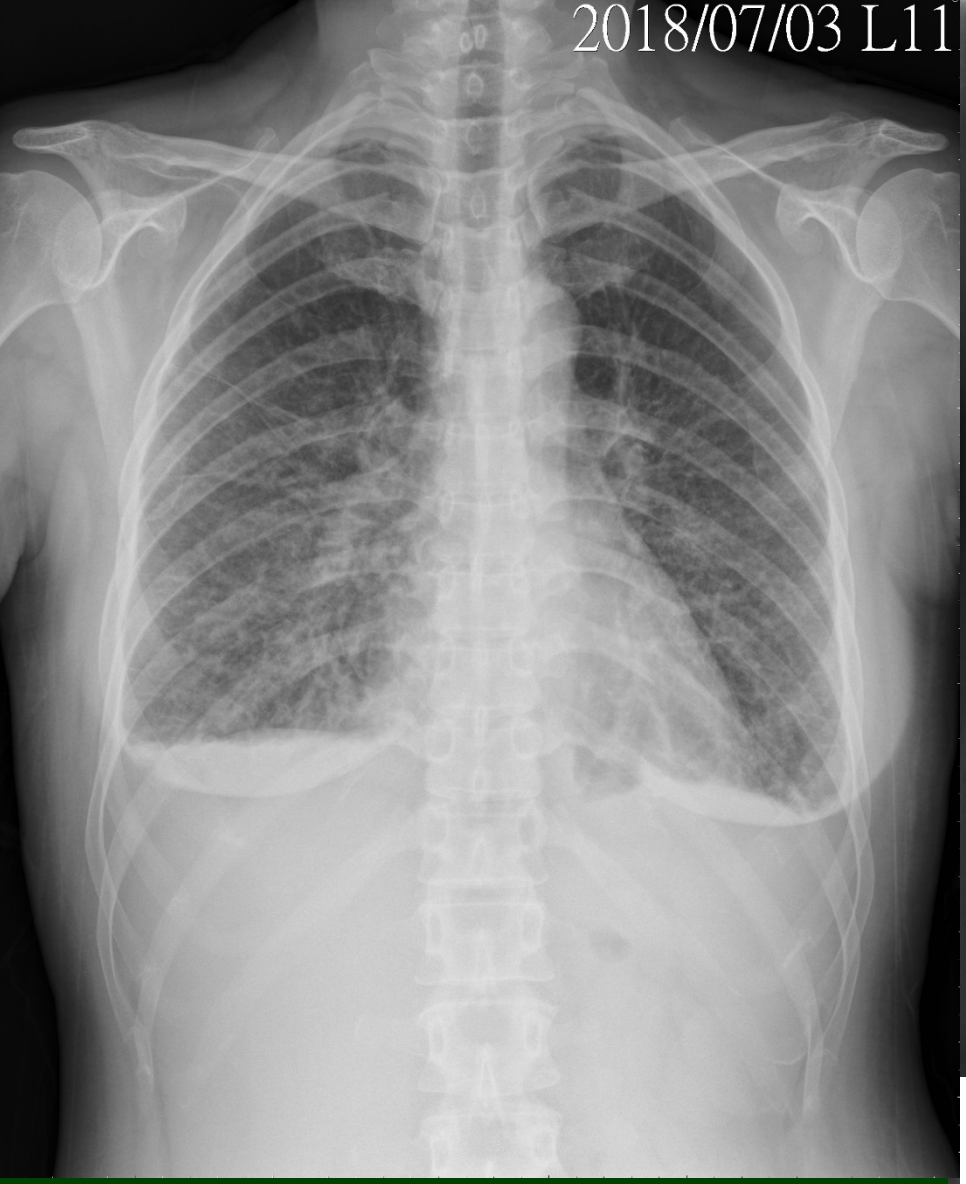
Mycoplasma Pneumonia

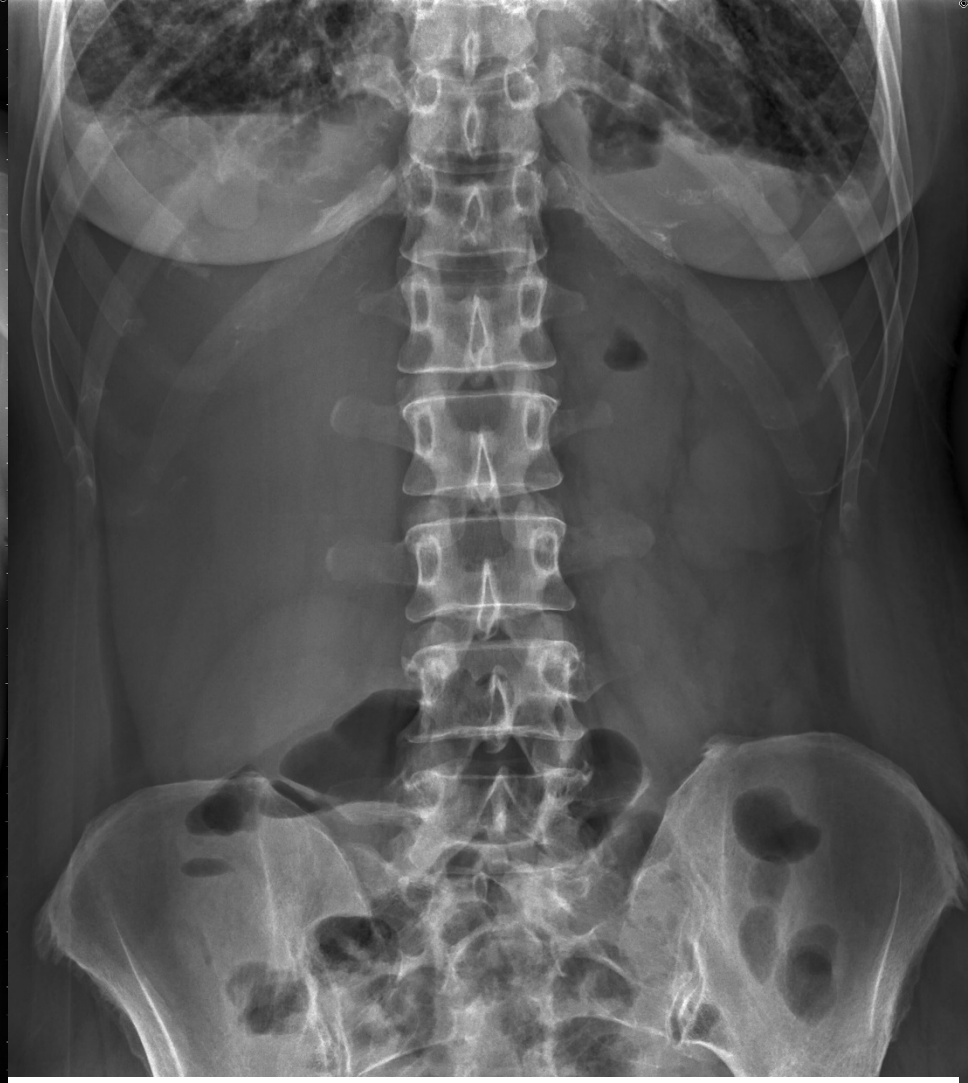
After antibiotics





猜猜我是誰?





46F, denied underlying dx, with symptoms of fever, vertigo

Hb=14.8, WBC=7990, Band=9.7%, PLT=96k

GOT=366, GPT=231, Bil=1.8, Lactic acid=2.9

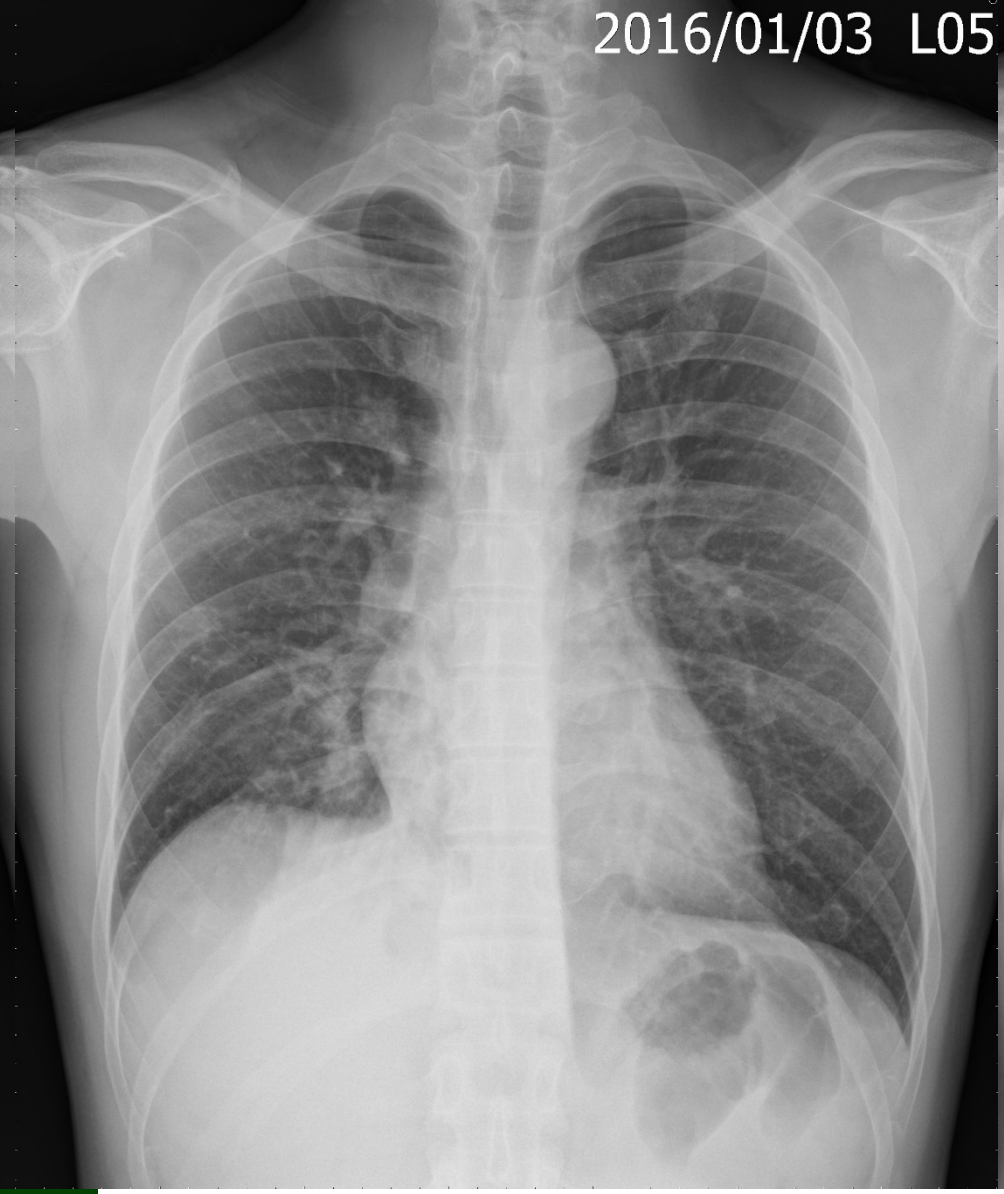
Scrub typhus

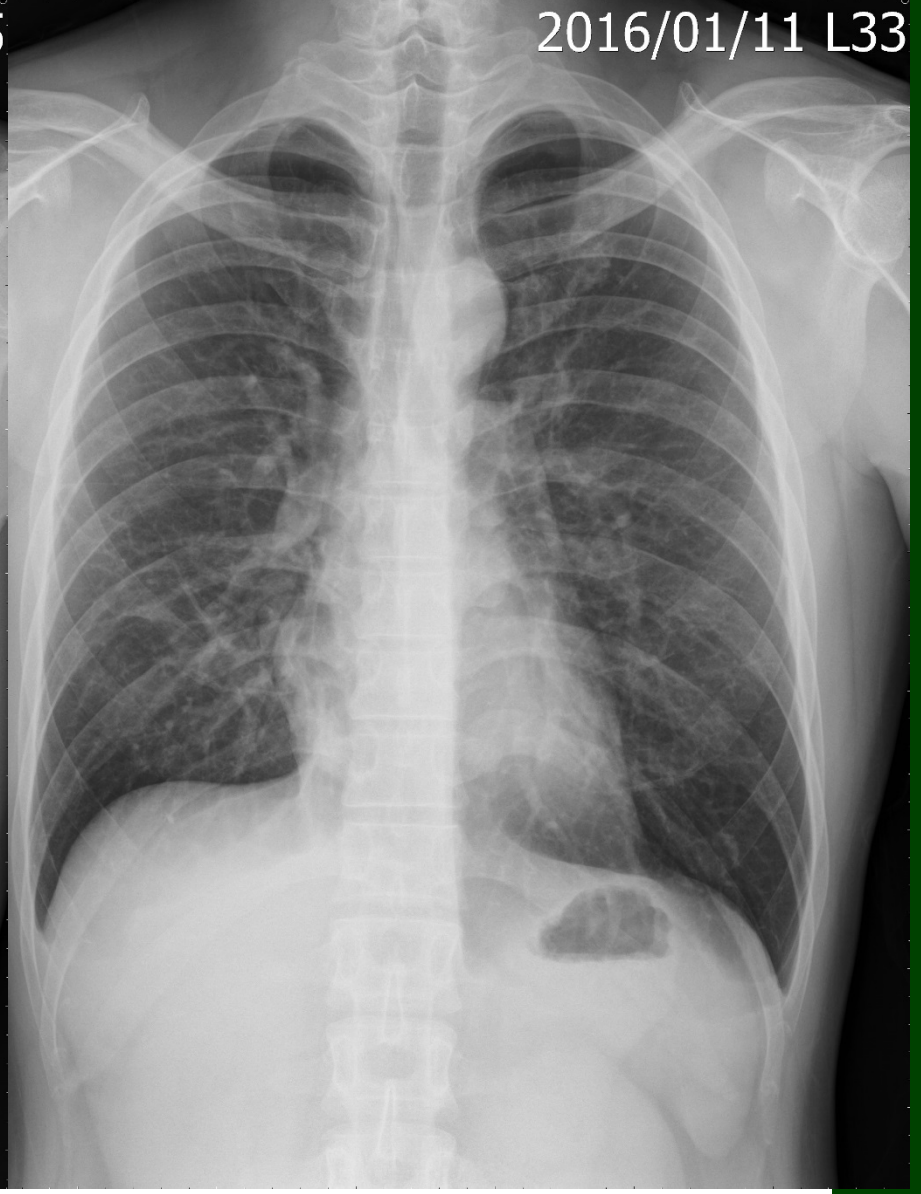
IFA-IgM=1:80 positive

IFA-IgG=1:640 positive

肺浸潤與肺葉容量

- GGO: 通常肺葉容量維持正常，不會改變
- Consolidation: 通常肺葉容量也維持正常，不會改變，但少數個案可能肺葉容量會改變
  - 變小：可能因肺炎的痰塊或氣管內腫瘤、異物堵住近端氣道(obstructive pneumonia)，或是肺炎造成部分肺實質纖維化、或肺炎之前先有肺容變小所致
  - 變大：當病菌大量迅速破壞肺實質，而產生大量黏液或膿瘍，但未能及時自氣道排出時，該肺葉容量可能會變大，而且影像呈像可能較濃，甚至破壞肺紋，造成原有的air-bronchogram消失
- 如何判定肺葉容量變大或變小：肺裂位移或變形

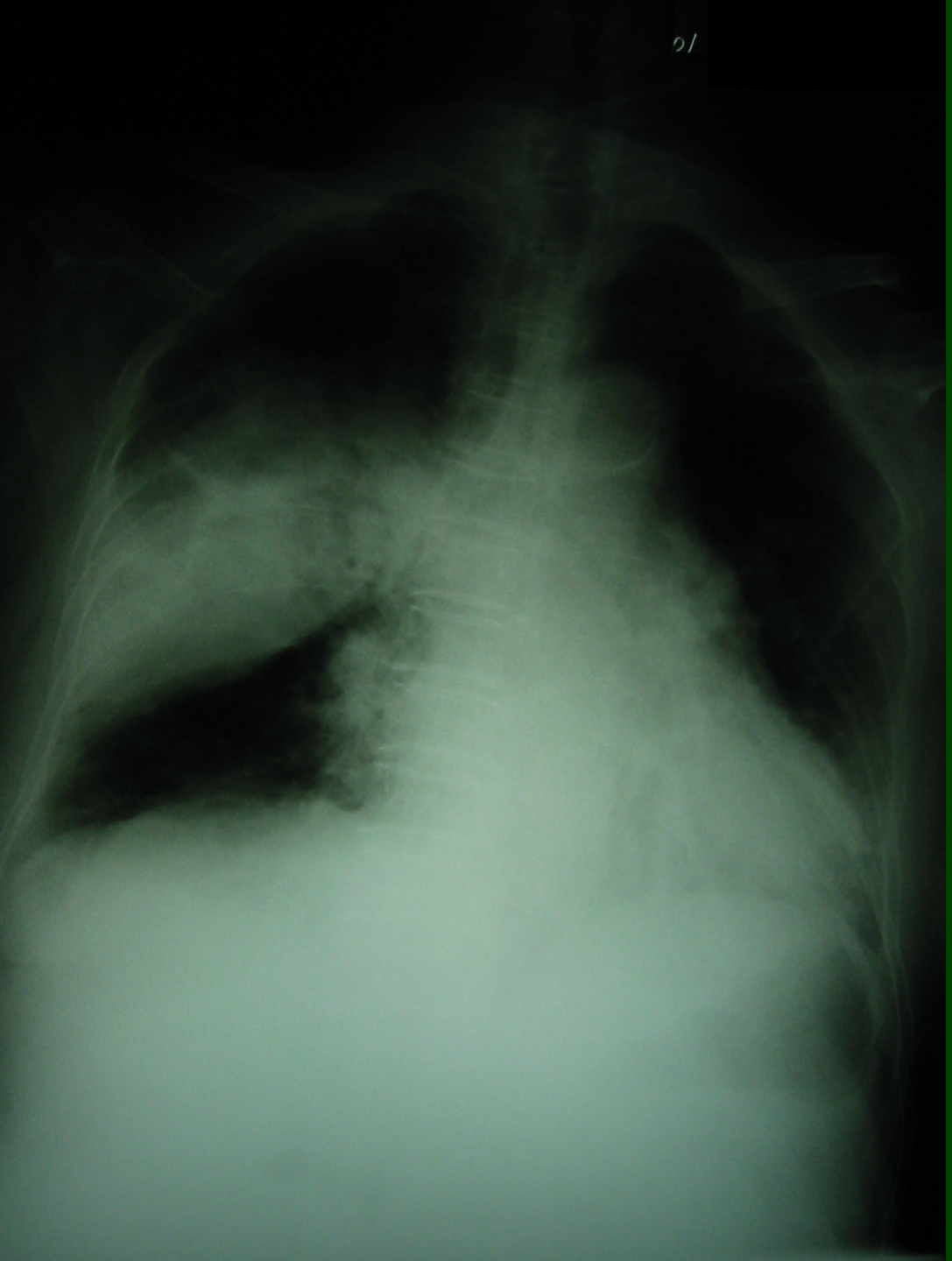




Pneumonia > Sputum Stagnation >endobronchial lesion > RLL atelectasis

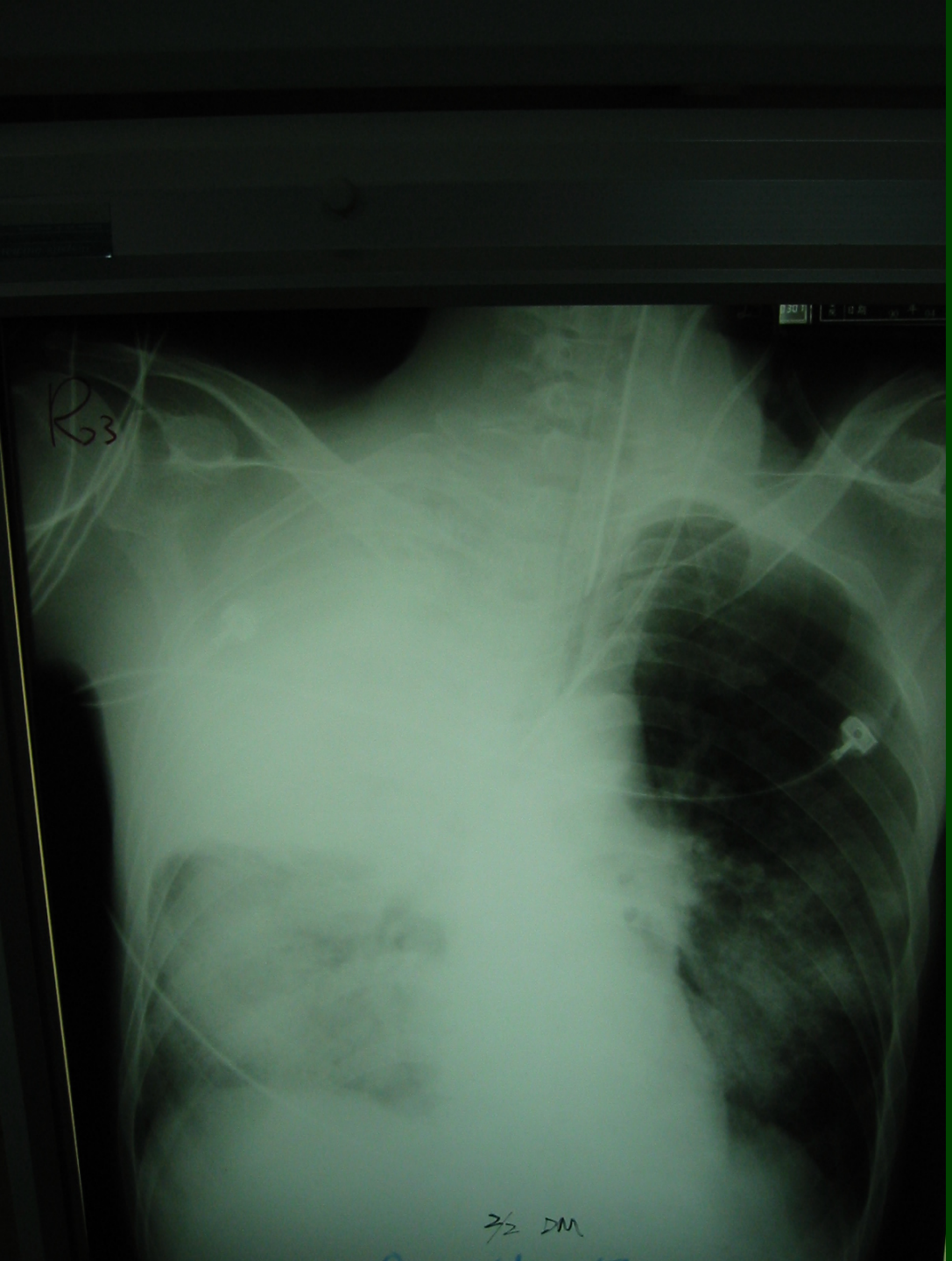
Lobar Expansion

- Streptococcus pneumoniae
- Klebsiella pneumoniae
- Pseudomonas
- Staphylococcus
- Tuberculosis
- Carcinoma with obstructive pneumonia (drowned lung)



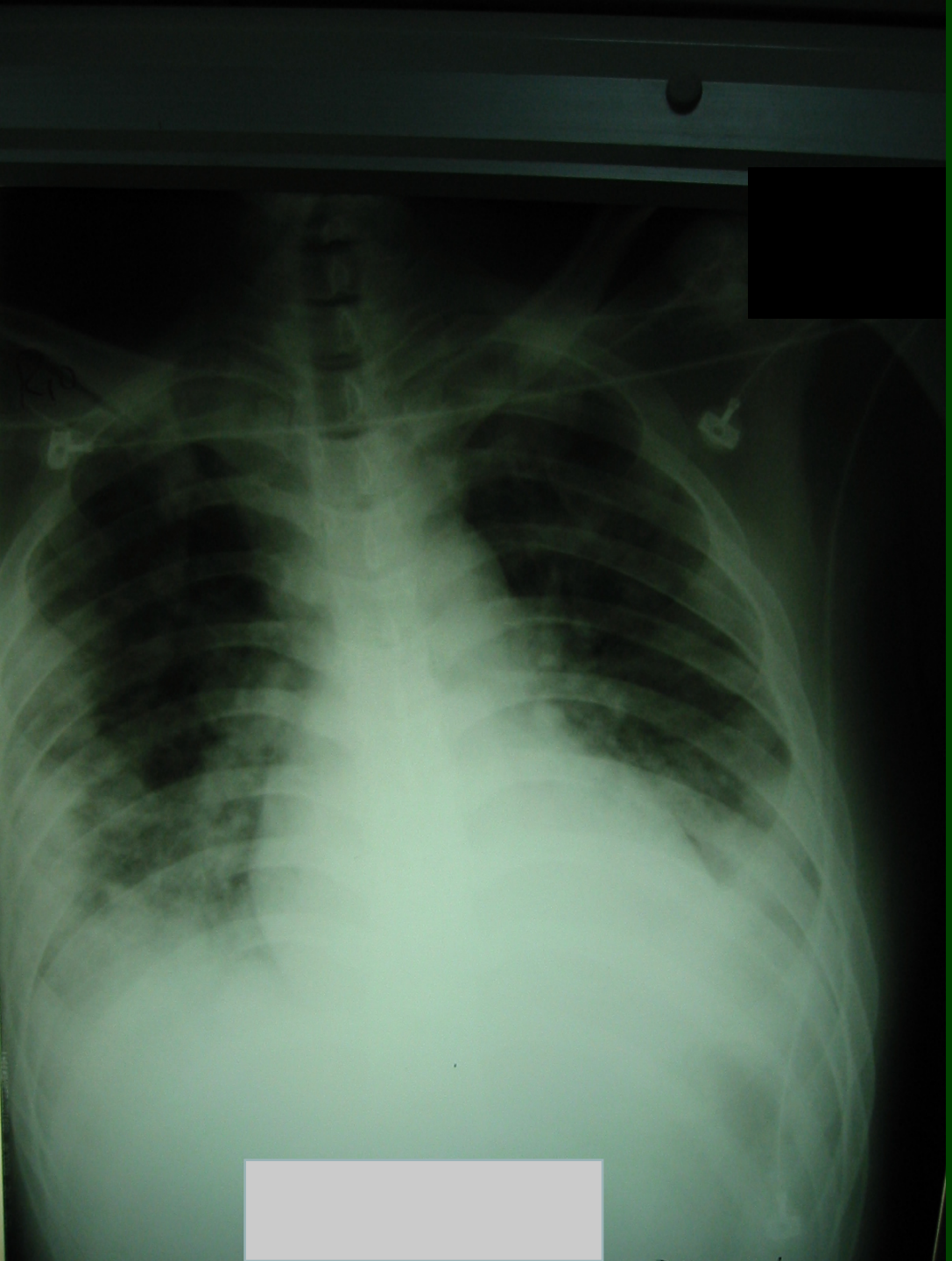
Dense consolidation, RUL with minor fissure downward deviation & paucity of air-bronchogram

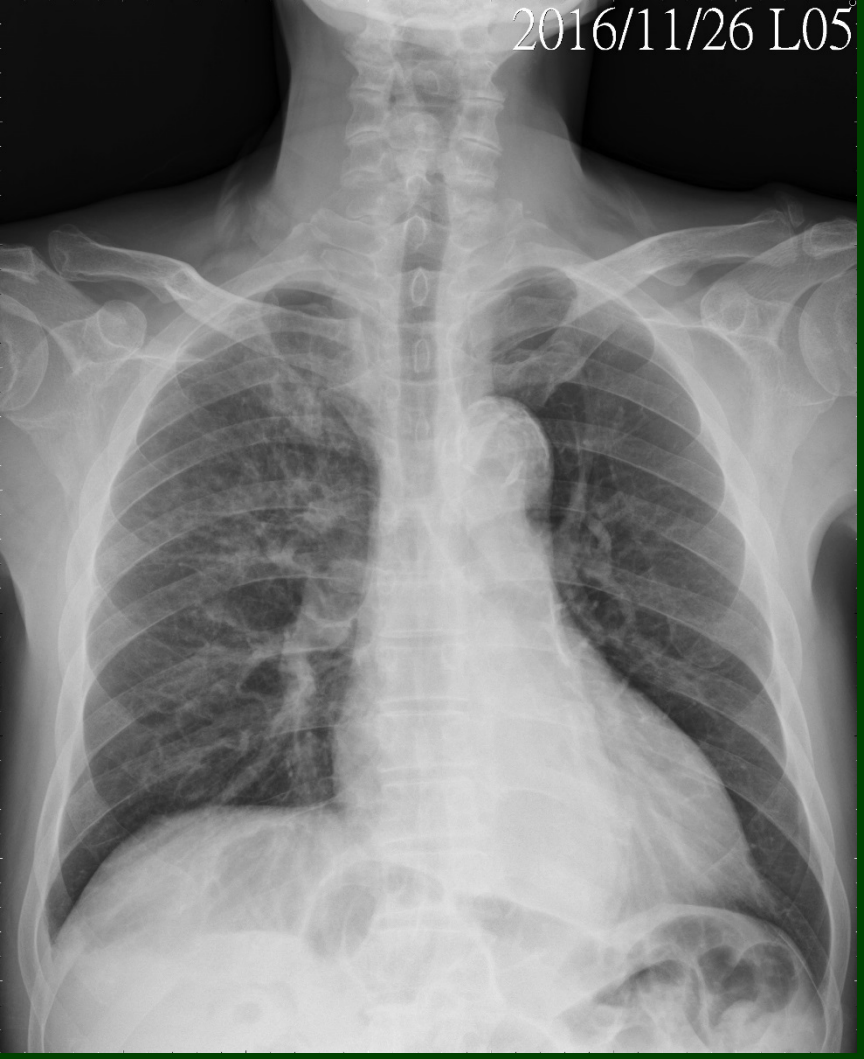
可以善用fissure的凹凸，來斷定volume expansion

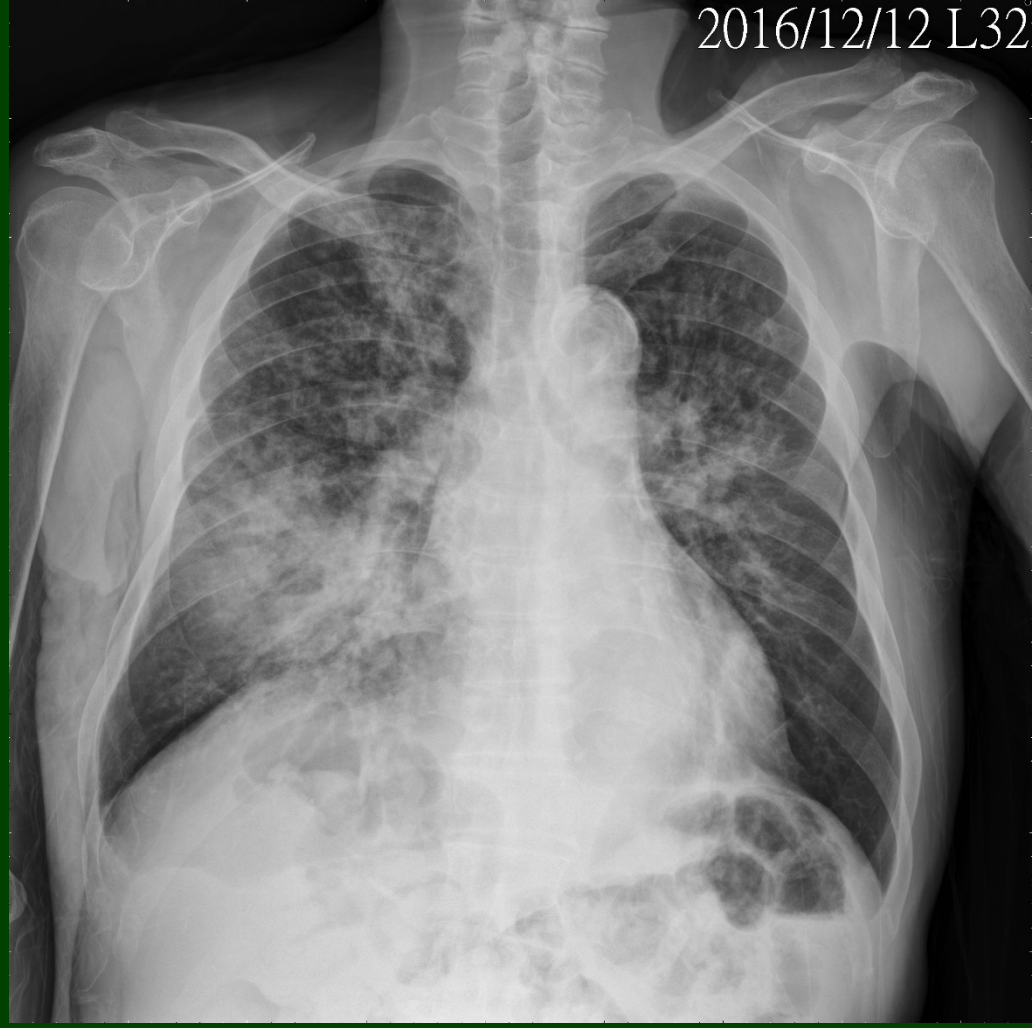


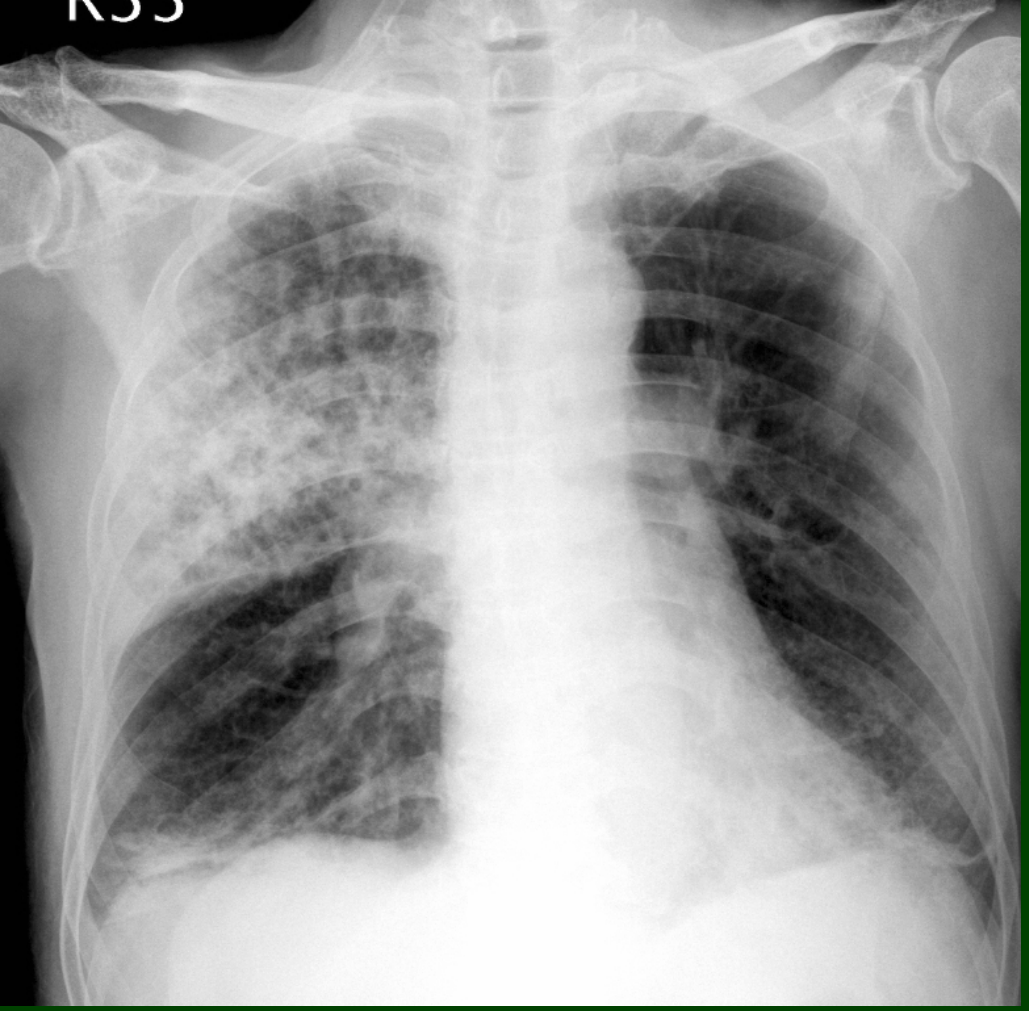
Complete opacification RUL

Infiltrates RLL & LLL

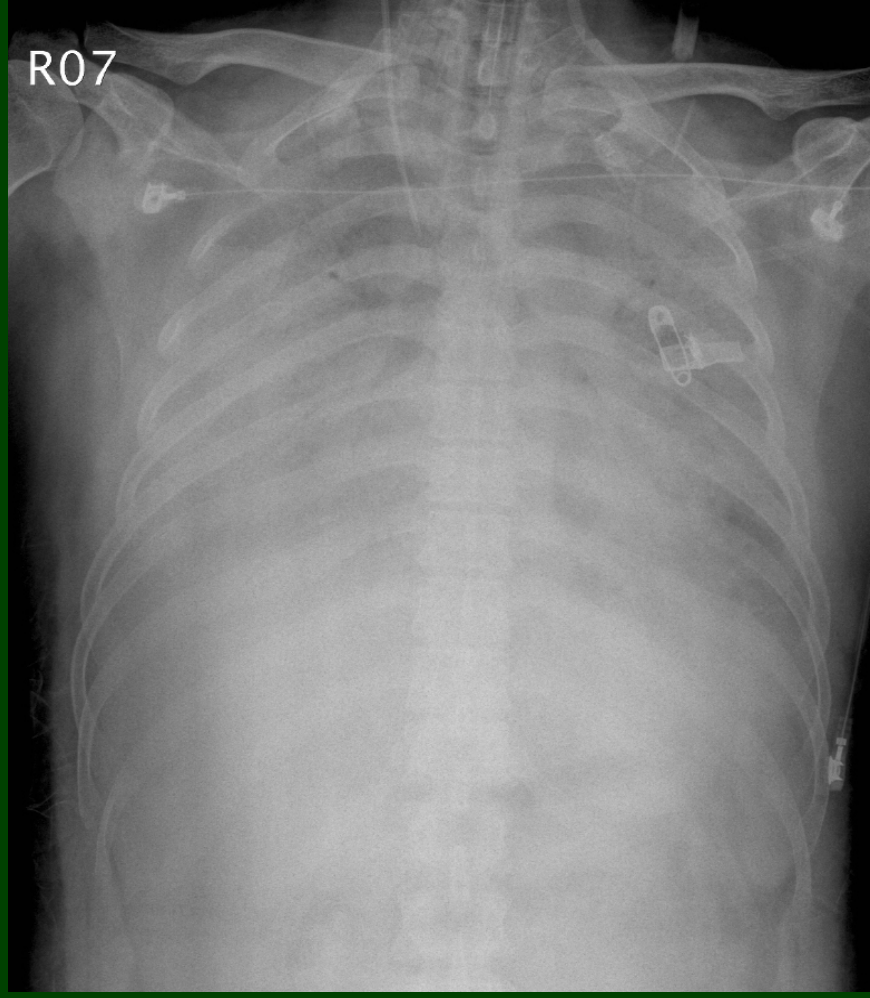



2016/11/26 L05


2016/12/12 L32

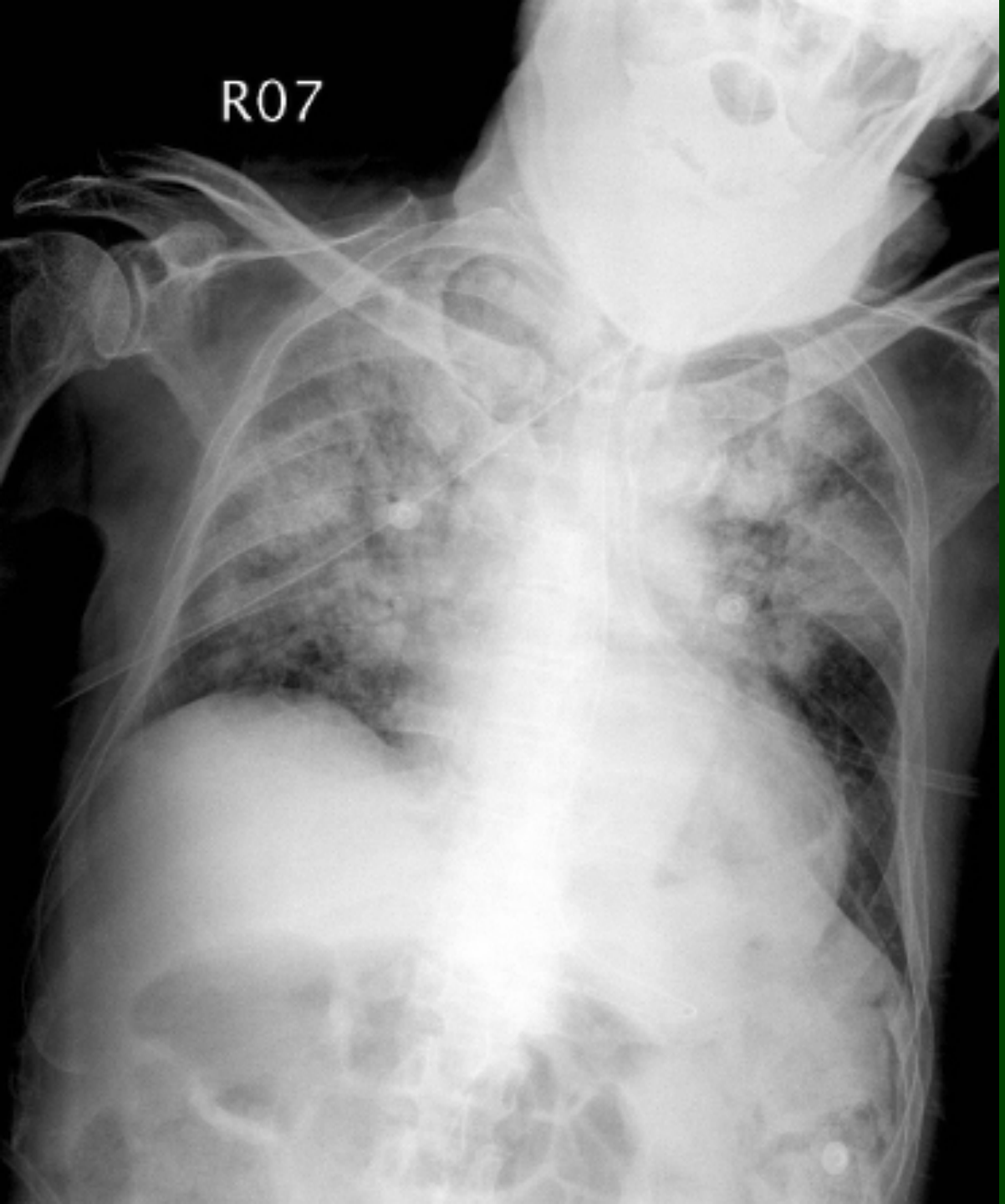


Multiple lobar

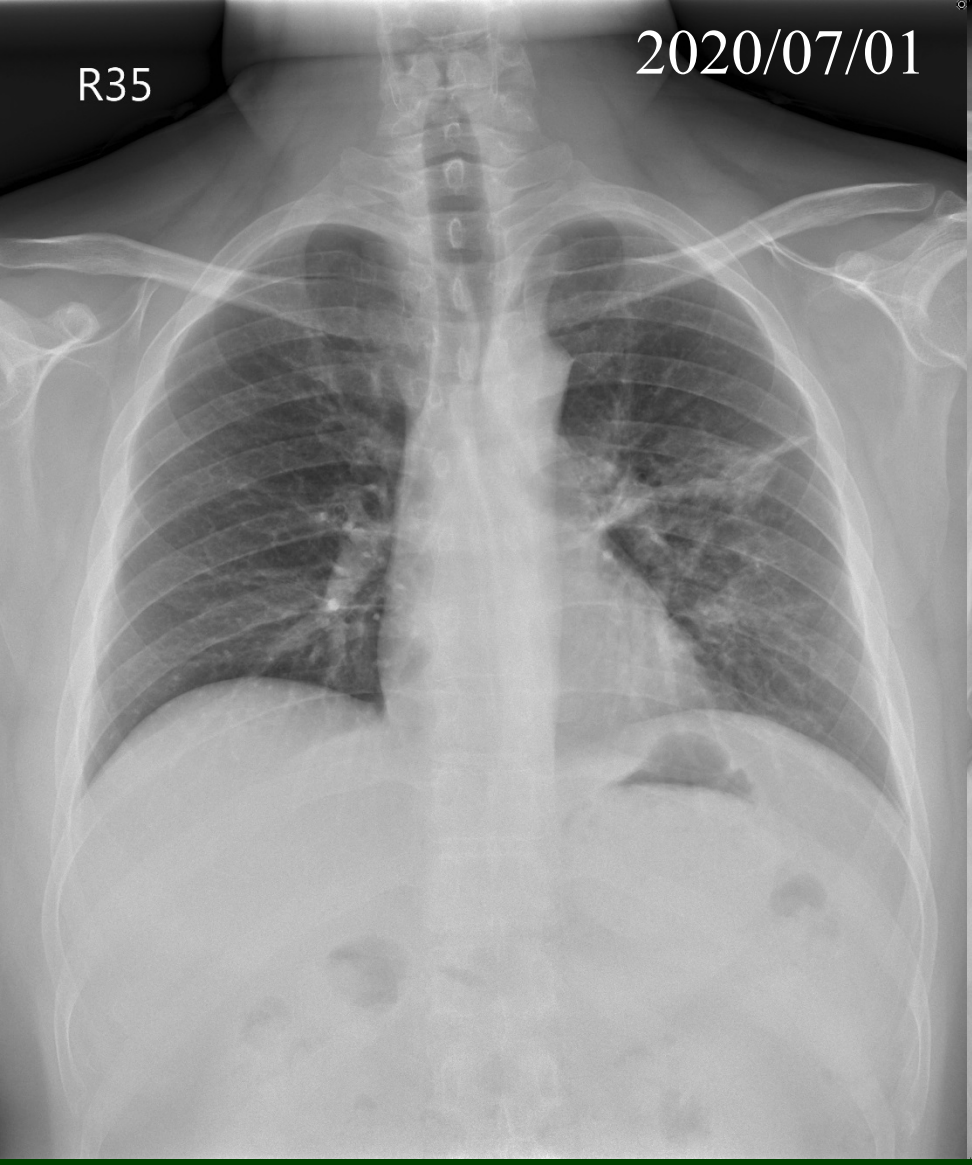


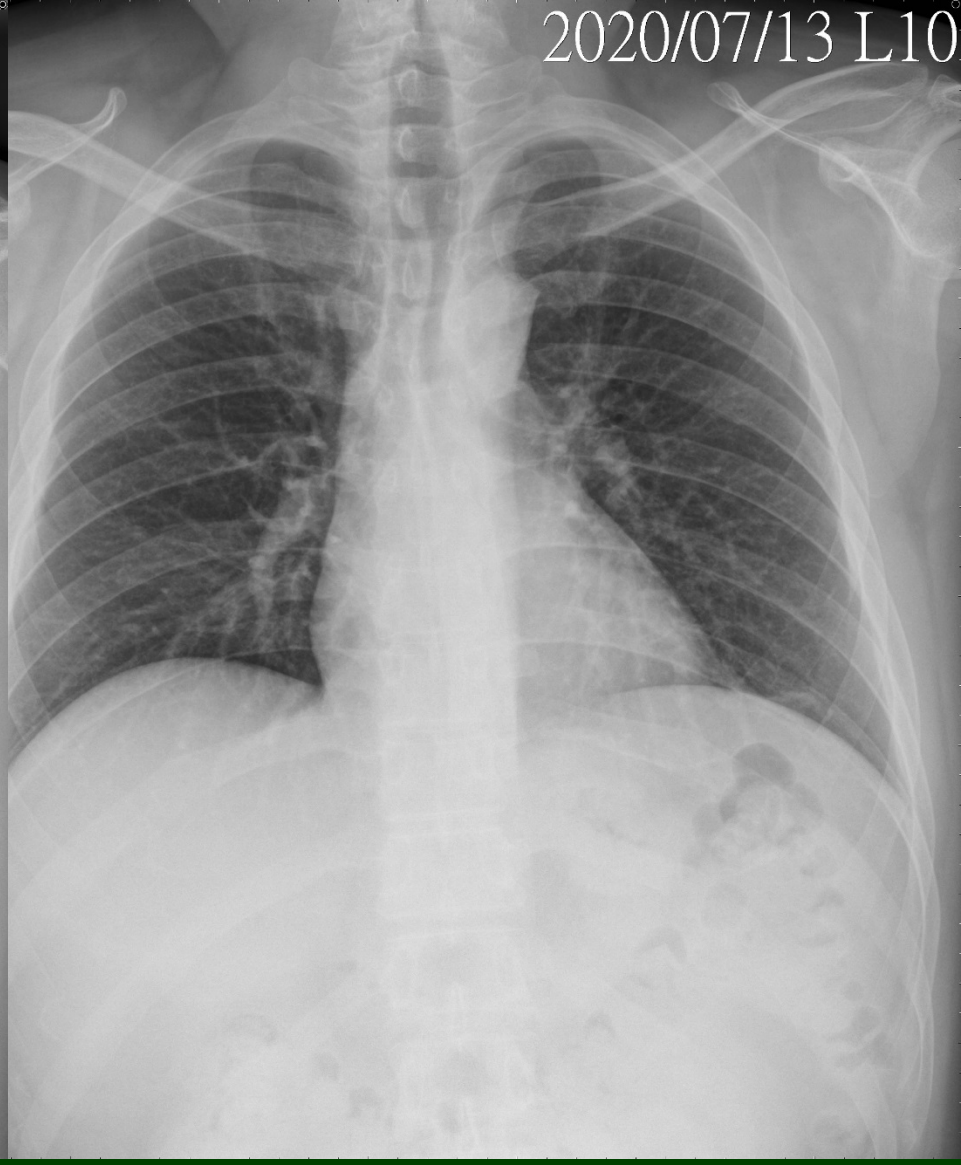
Diffuse white out

Liver abscess, KP, ARDS



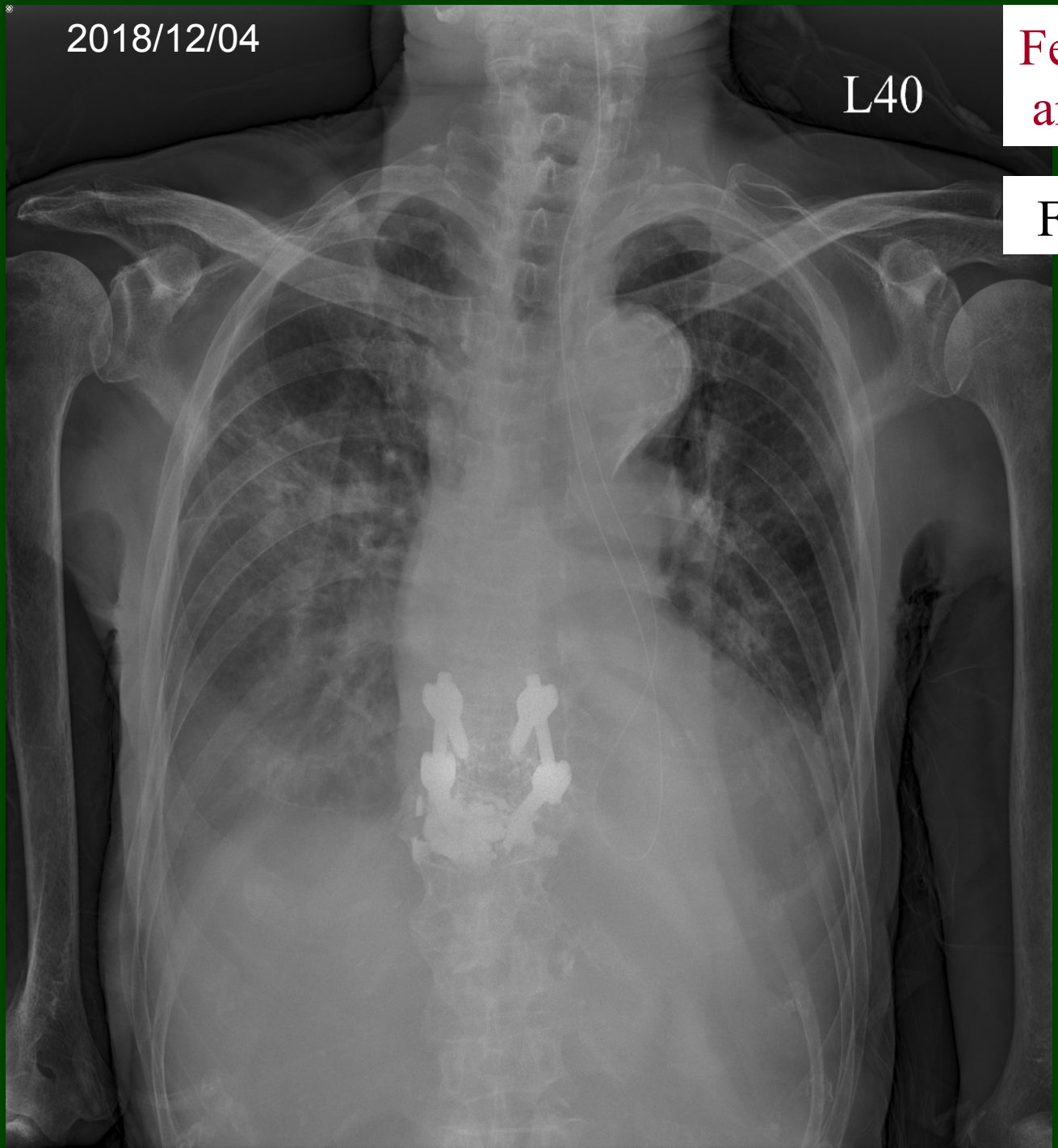
Aspiration pneumonia





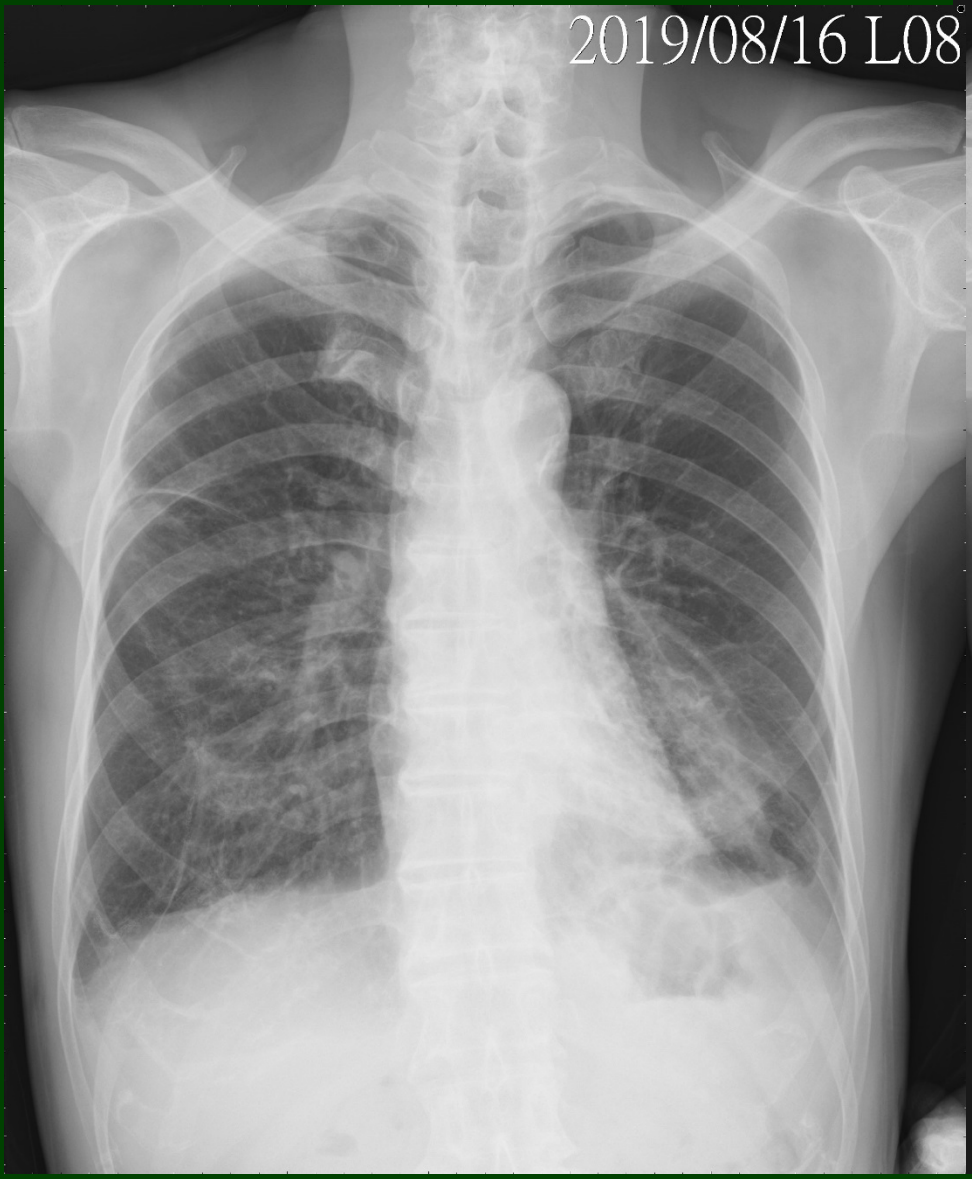
全麻胃鏡 in the morning
Fever and cough developed evening

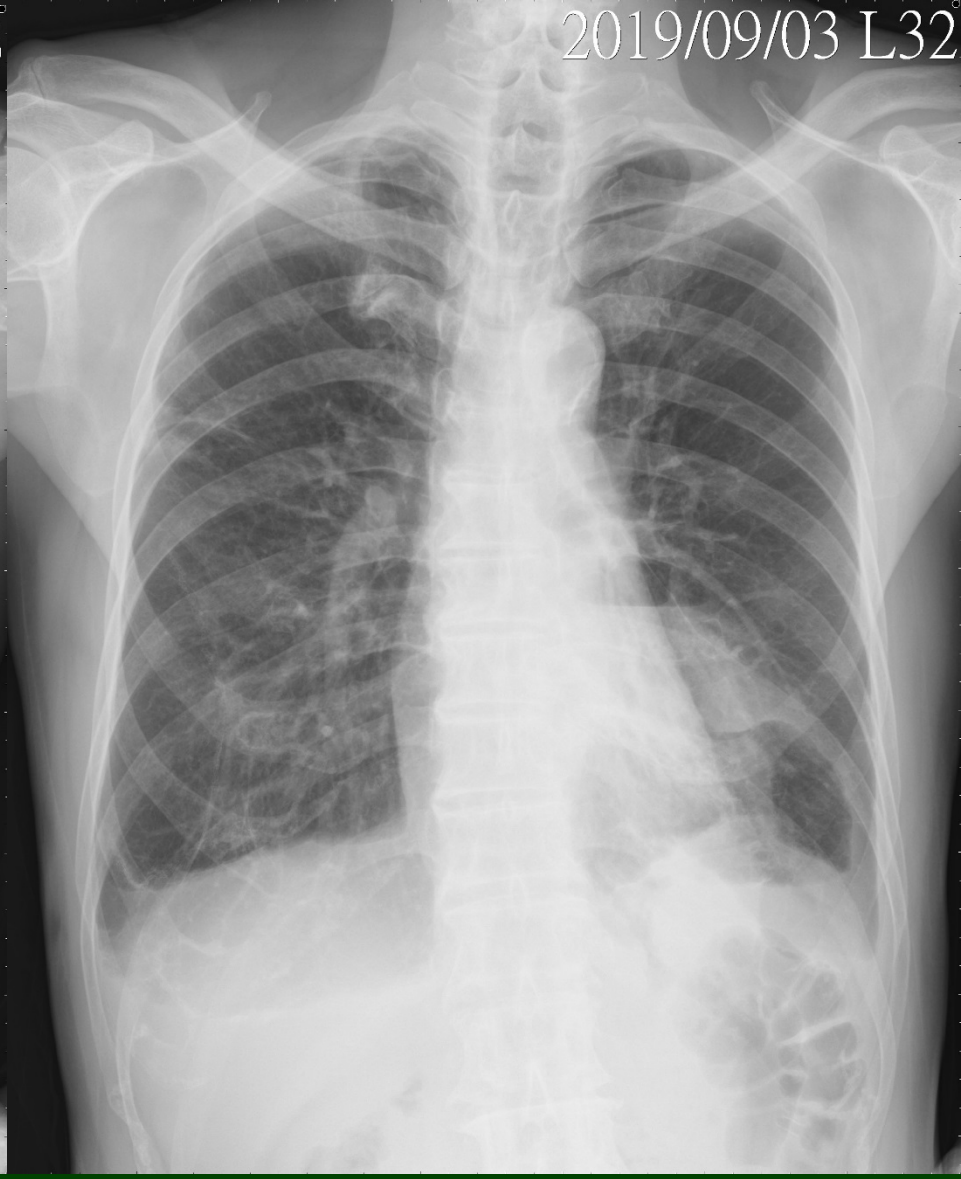
Favor aspiration lung injury
Gastric acid chemical pneumonitis?

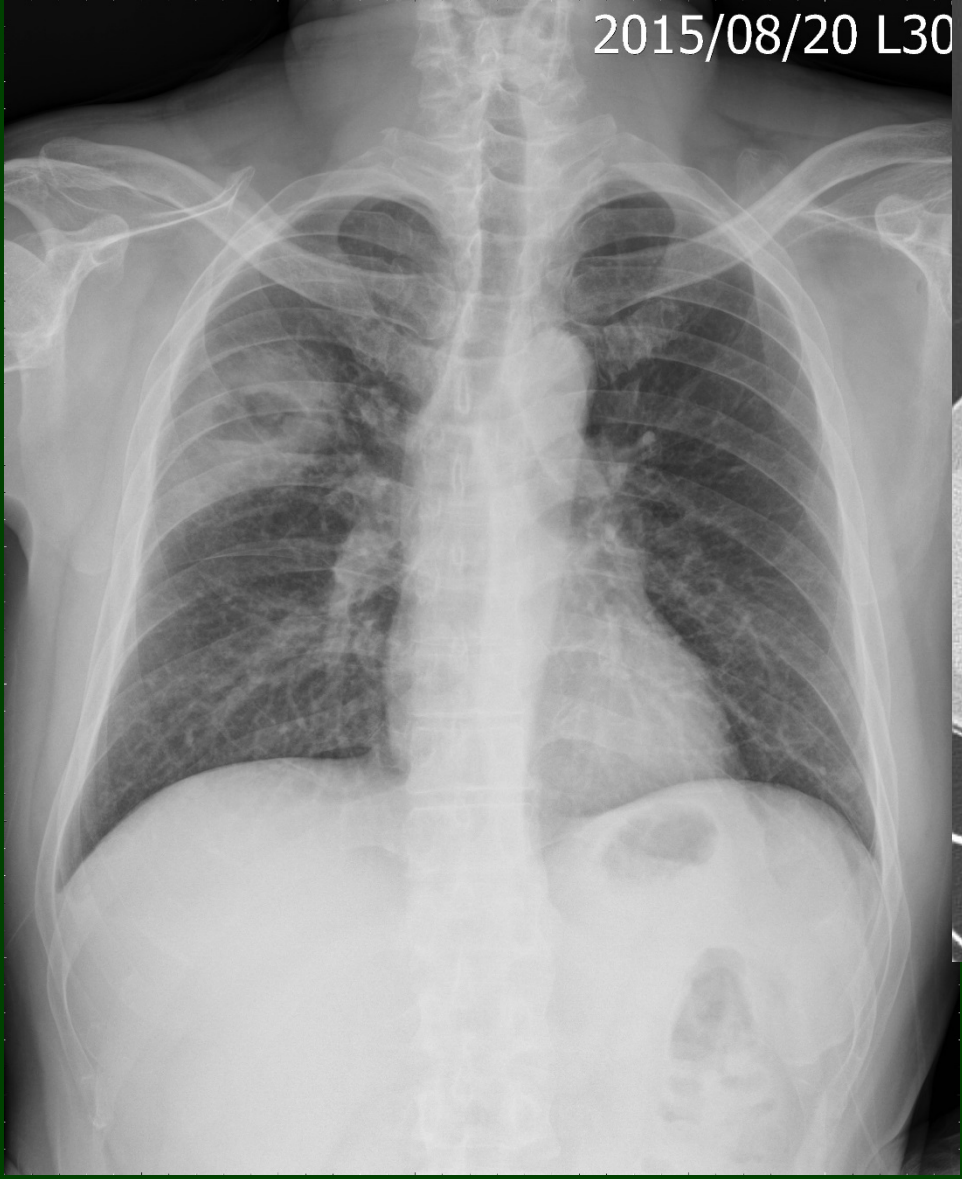


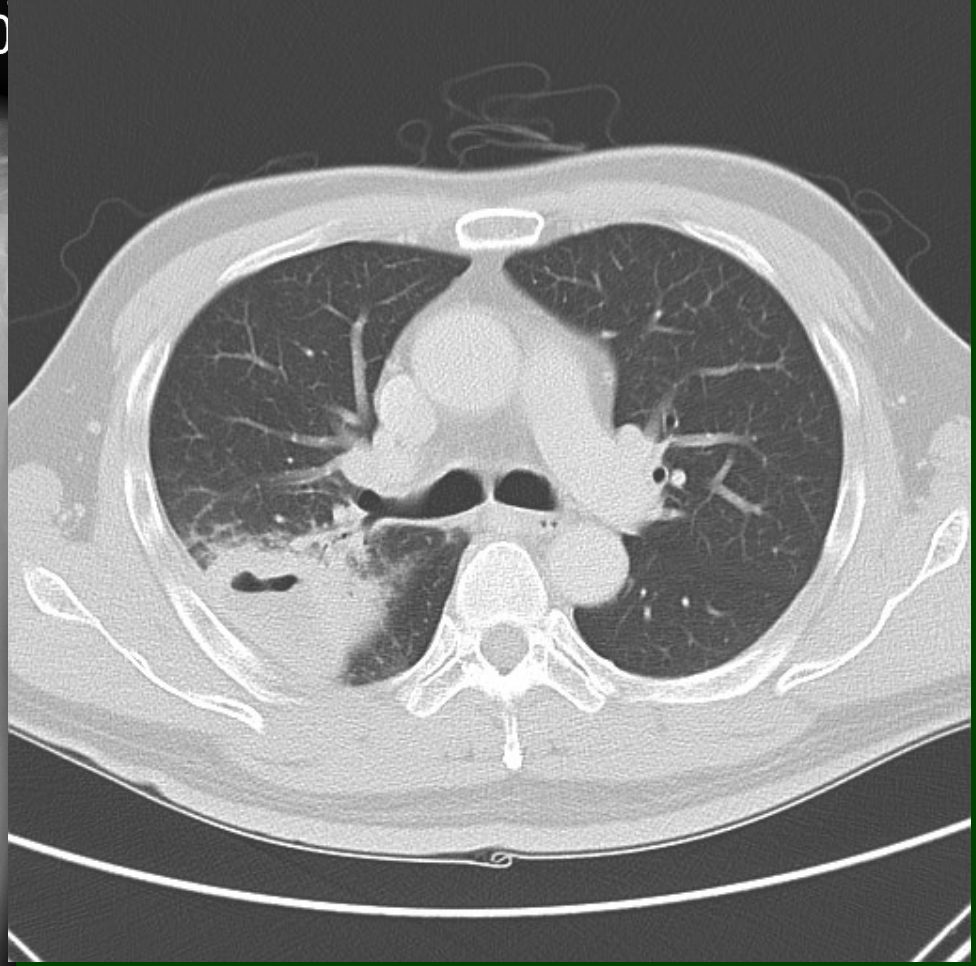
Fever, productive cough and SOB for 3 days

Findings & Diagnosis?

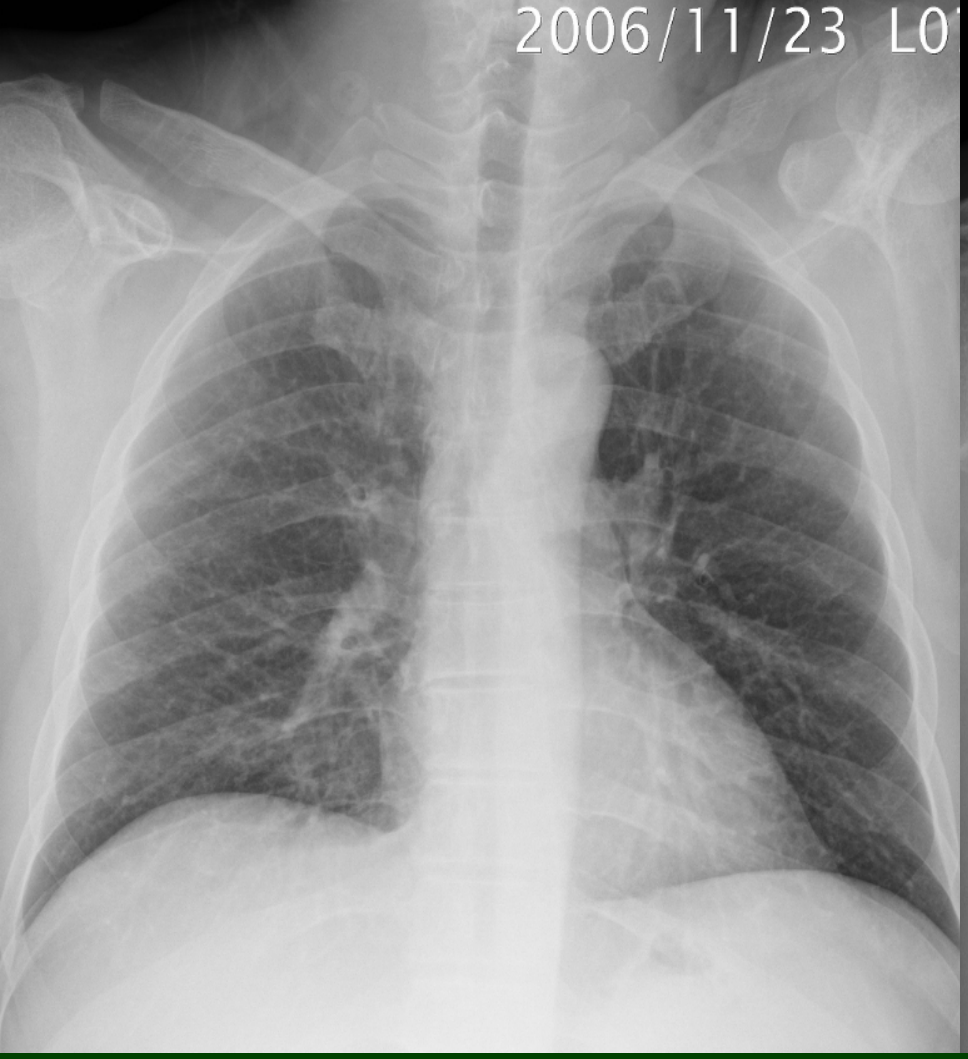

2019/08/16 L08

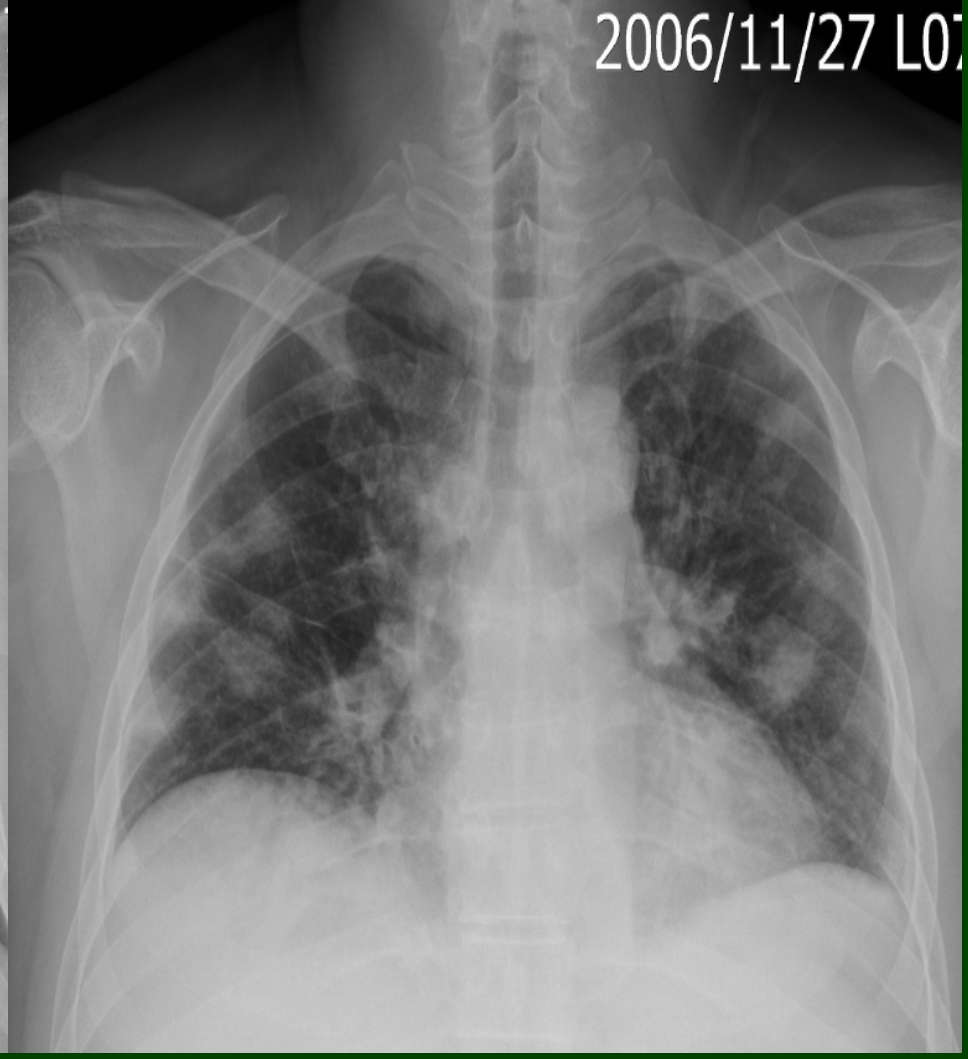

2019/09/03 L32





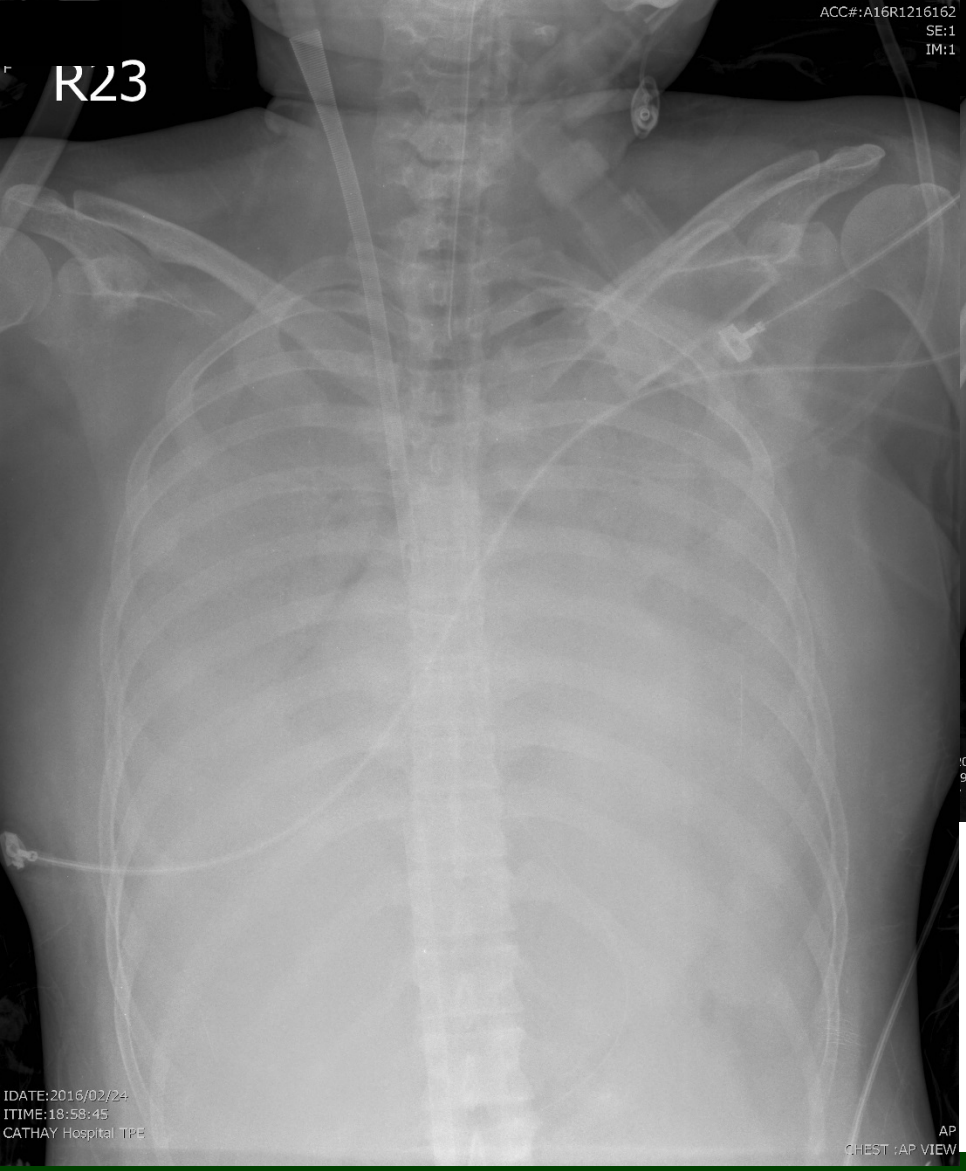
Lung Abscess

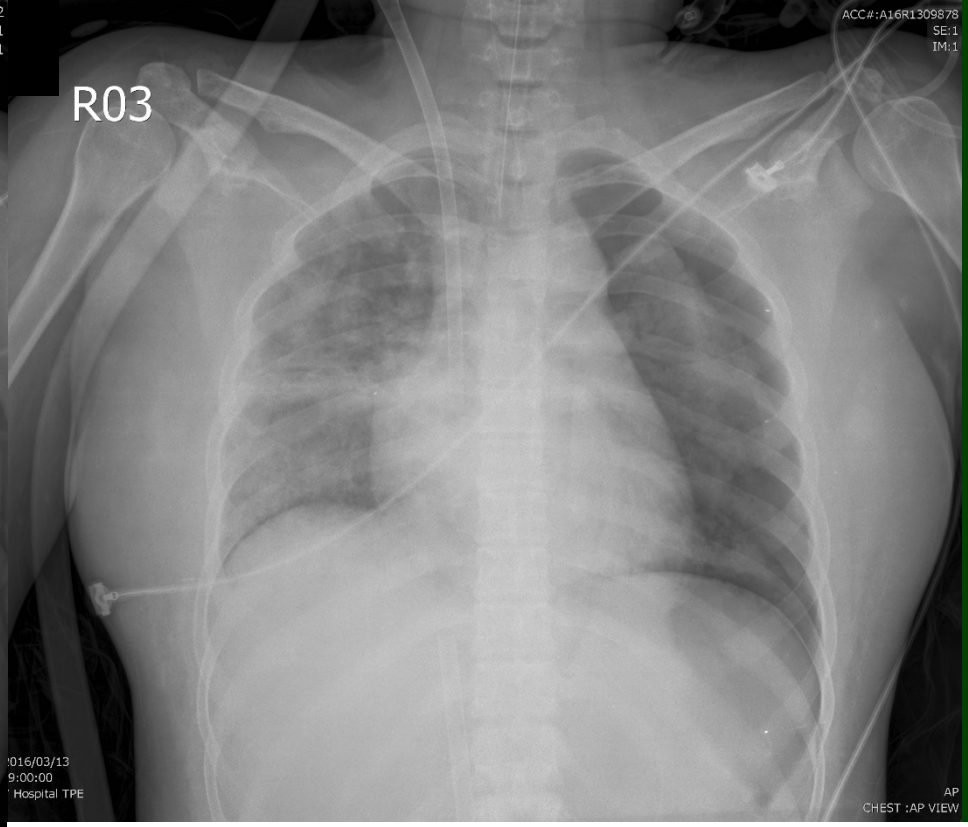

2006/11/23


2006/11/27

Septic pulmonary embolism：

1. 有一點像肺栓塞，但臨床又有sepsis的症狀。
2. X光特點是斑塊病灶多發、周邊為主、駝峰狀斑的尖端約位於鎖骨中線，且此尖峰通常是朝向肺門方向。
3. 型狀有時像腫瘤，但病灶邊緣卻有點模糊，
4. 有時會帶少量帶血的肋膜積液。
5. 通常要考慮是否同時有IE; liver abscess, carbuncle; drug abuse打毒品、其他部位的abscess，而blood culture通常會呈陽性結果。



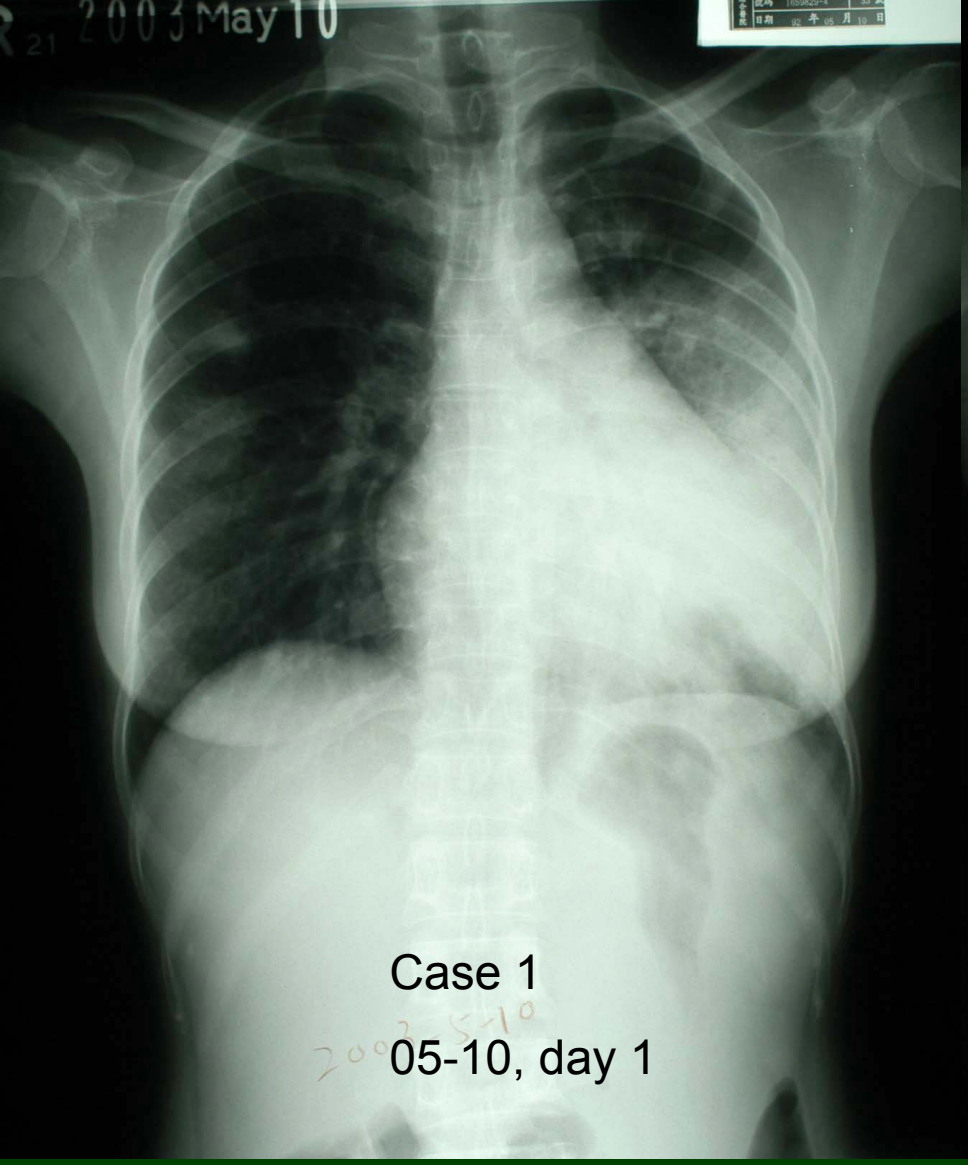


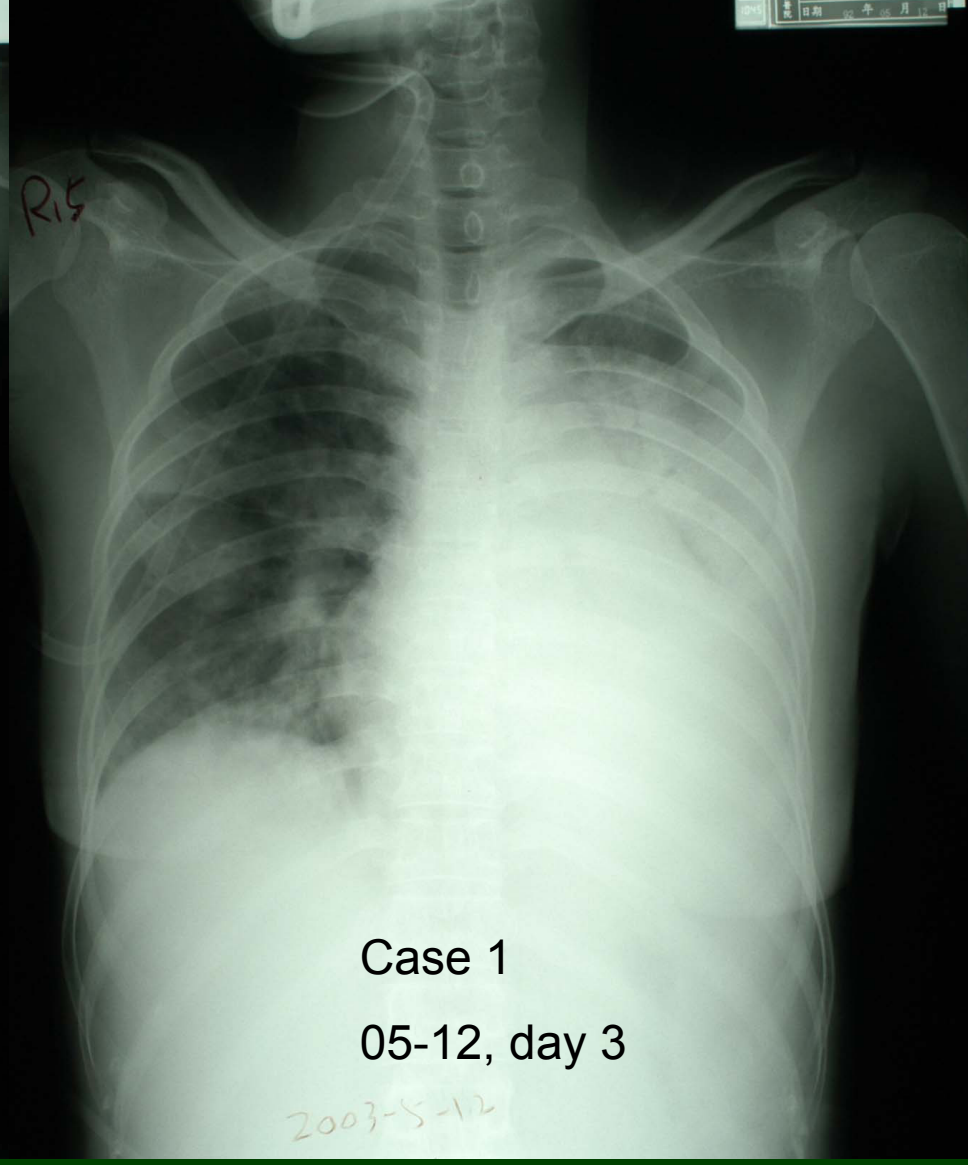
26F, got H1N1 pneumonia, with

- Respiratory failure, s/p ETT + ECMO
- Left side pneumothorax

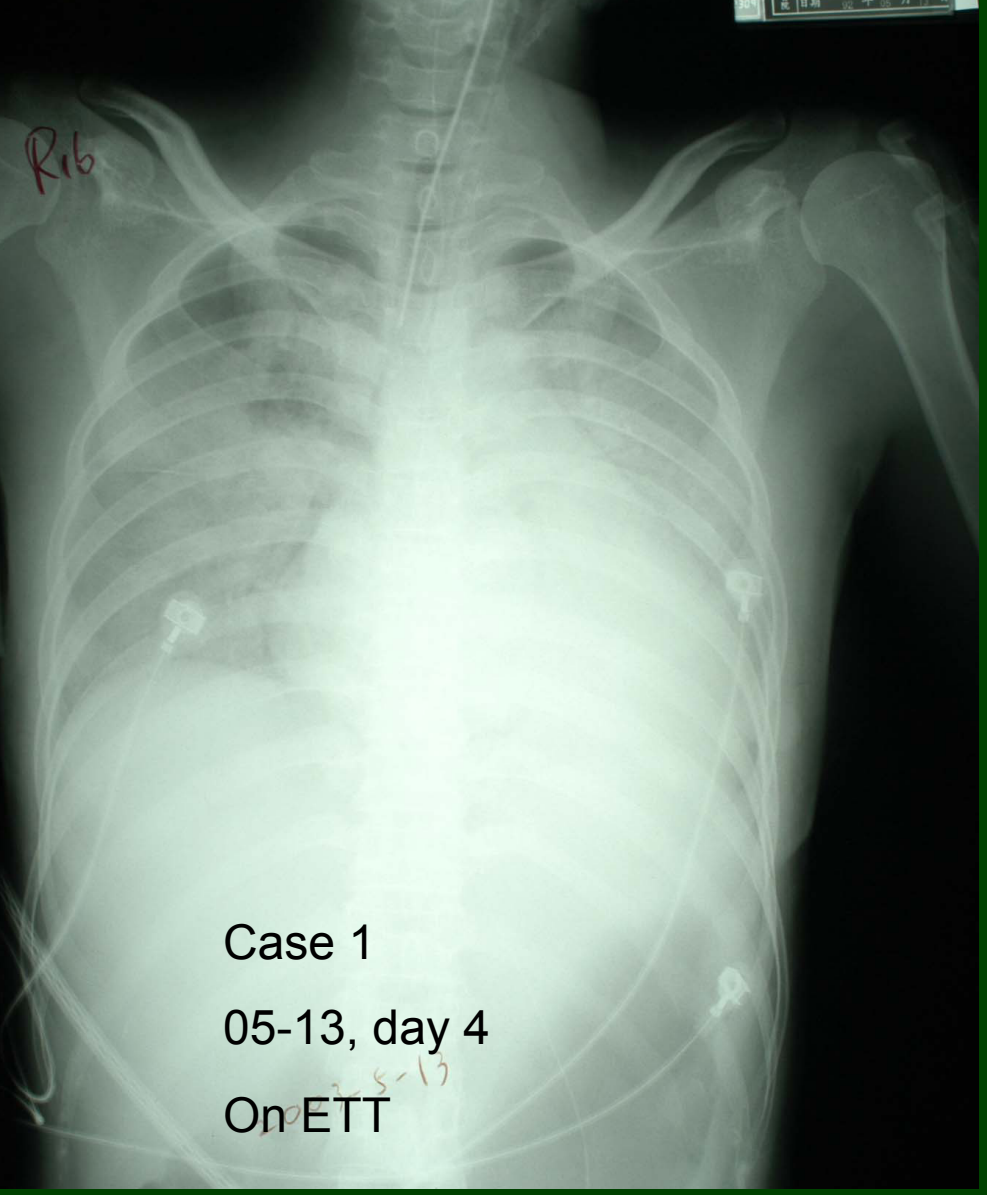
【嚴重急性呼吸道症候群】：SARS

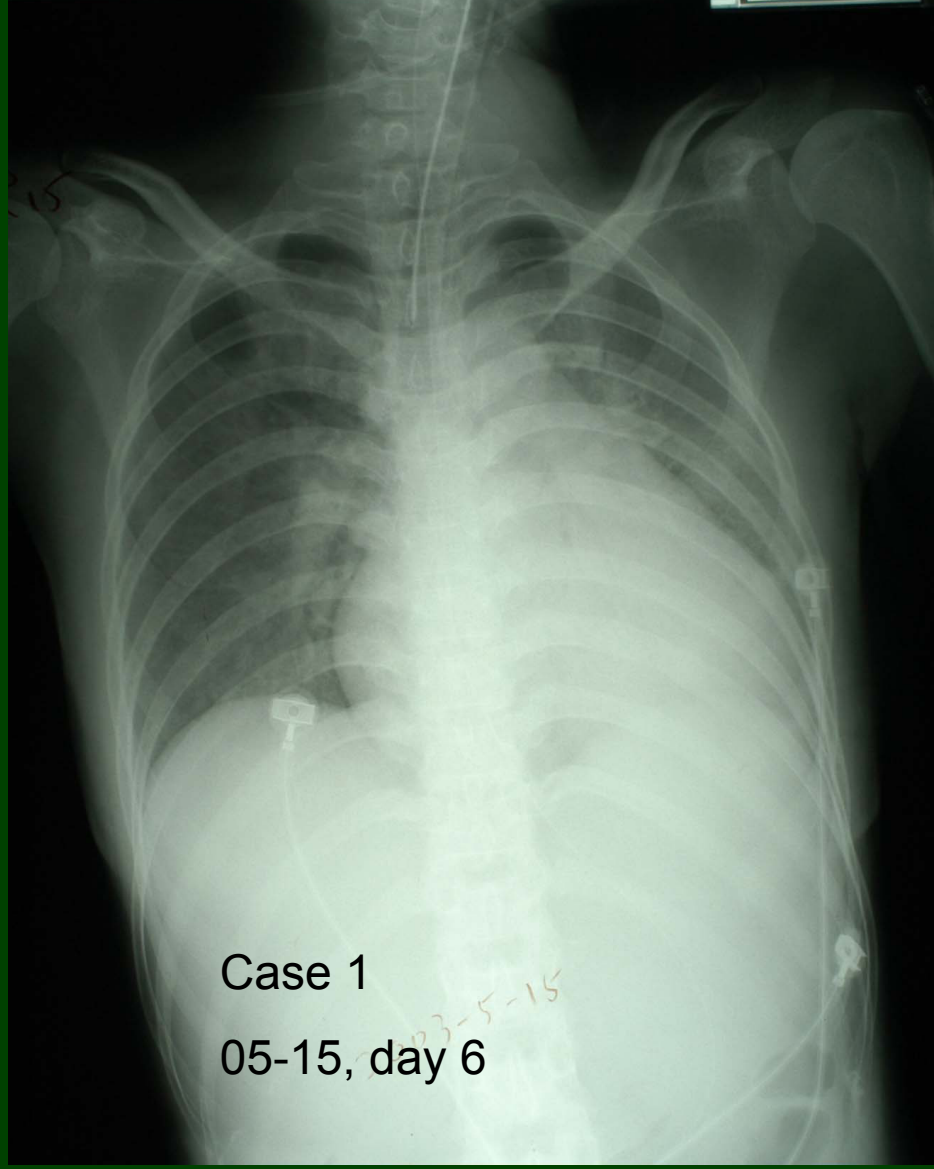
1. 早期常呈現subpleural Ground Glass Opacity (GGO)，有時也會以Consolidation表現，
2. 通常會快速擴展成雙側肺浸潤，甚至進展成ARDS而呼吸衰竭，
3. 有相當比率的個案會Pneumothorax或pneumomediastinum / subcutaneous emphysema。
4. 但較少有鈣化，開洞，肋膜積液或縱膈淋巴腺腫。





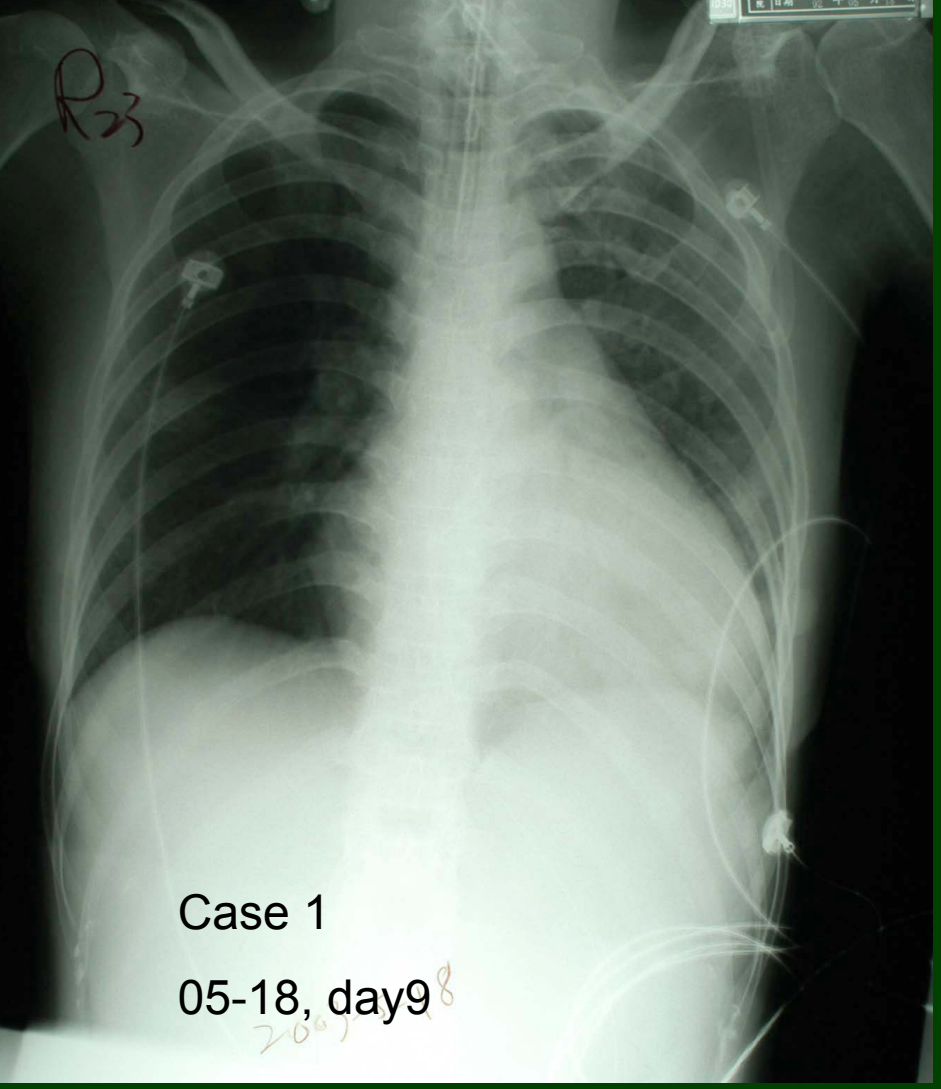
Right lung GGO, left lung consolidation

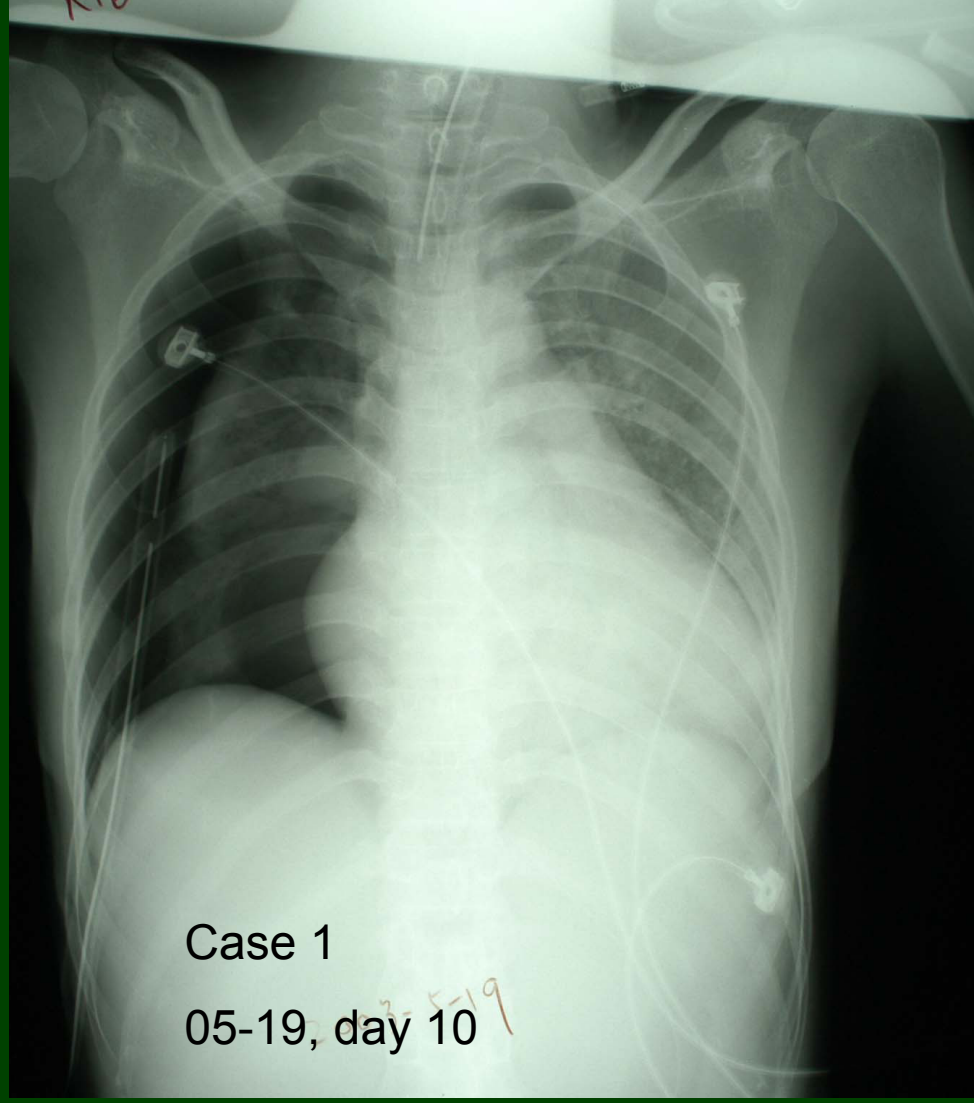




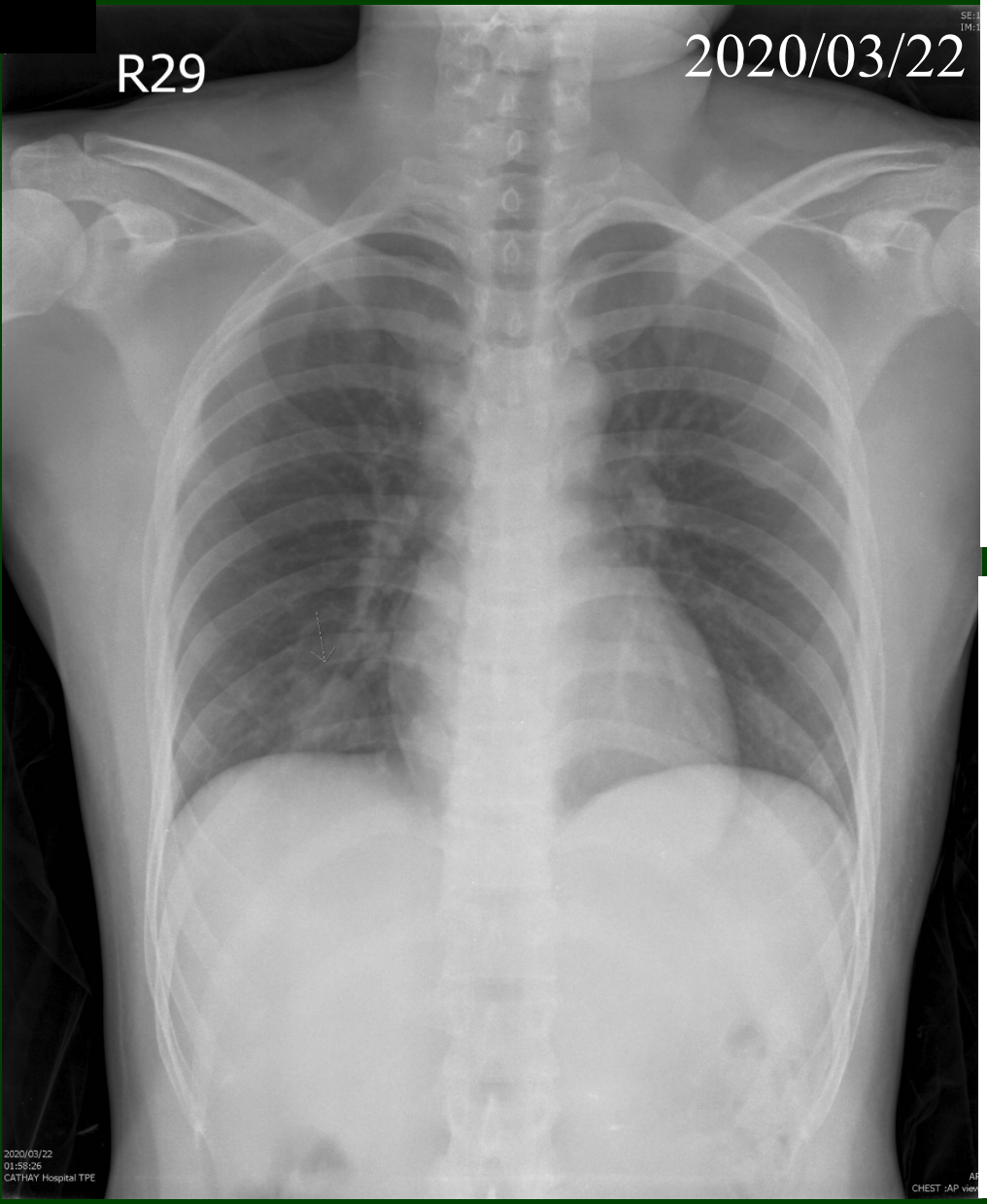
Diffuse consolidation with ARDS, on ETT day 4

呼吸器使用兩日後，肺浸潤顯著減少。





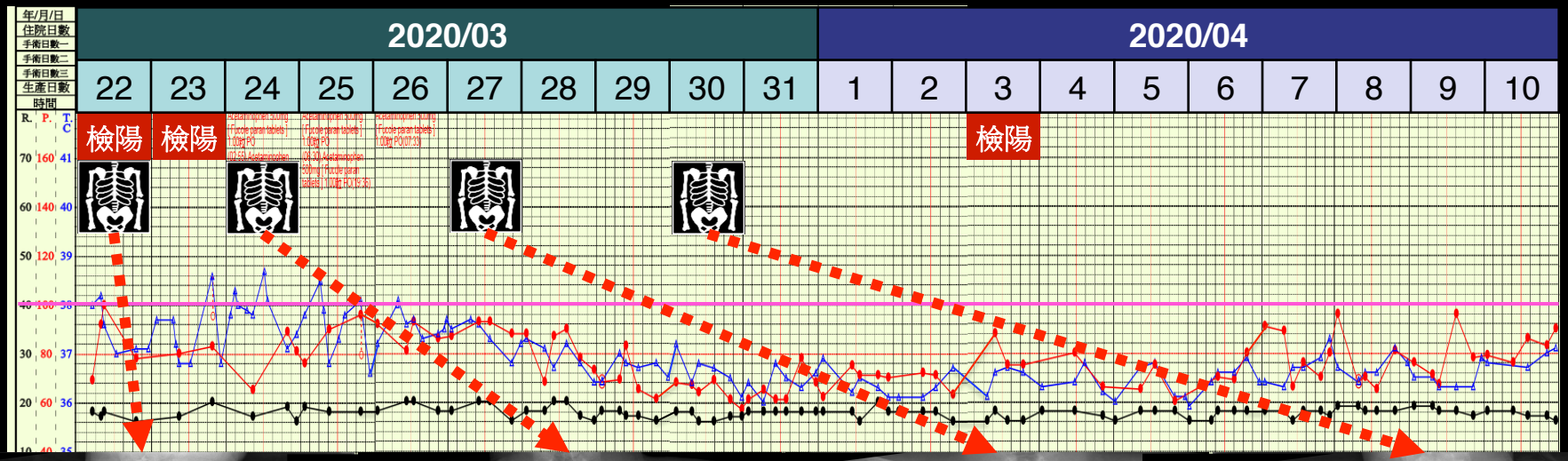
呼吸器使用六日後，肺浸潤持續顯著減少，但卻發生 pneumothorax (day 10)

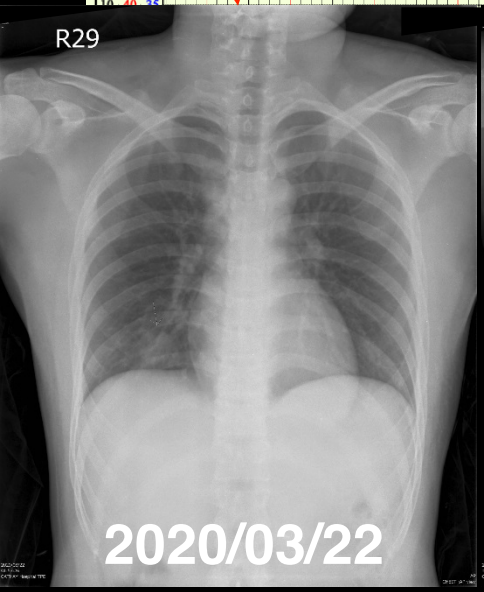


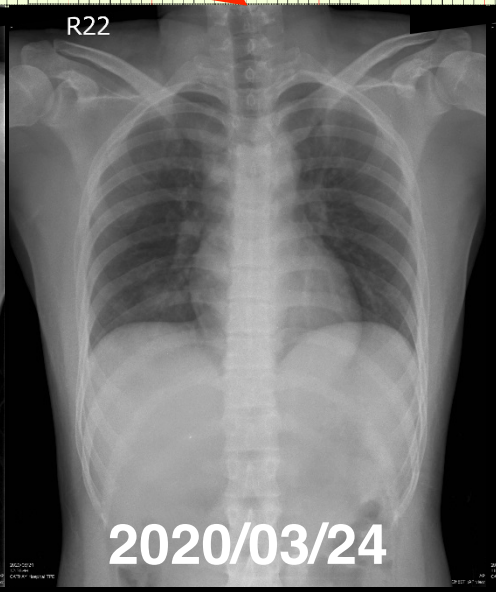
22歲女性
於2020年01月至荷蘭遊學並於2020年03月17日返台。03月21日開始發燒、全身痠痛及流鼻水等症狀，經衛生局電話通知，主動來國泰醫院急診接受檢查。

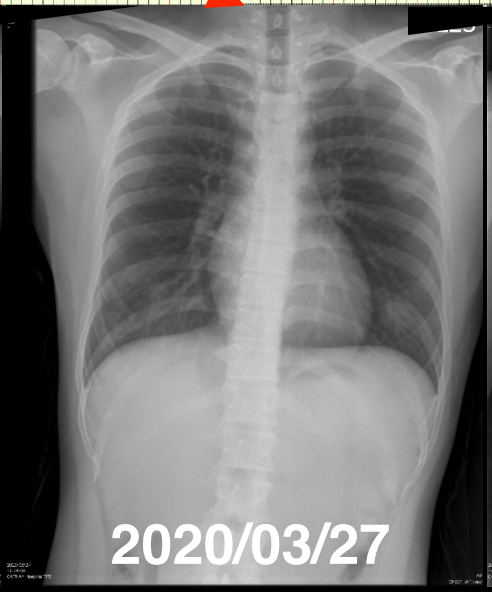
病人於03/22~26持續有發燒情形，X光肺部浸潤持續，因無法排除細菌性肺炎，更換抗生素為Levofloxacin
使用Levofloxacin期間，病人抱怨雙手發麻，疑似藥物過敏，加上病人逐漸退燒，將藥物換回Ceftriaxone

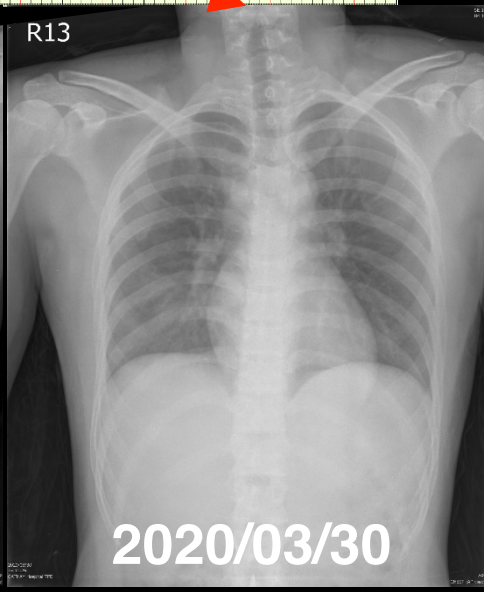
COVID-19 RT-PCR (+)

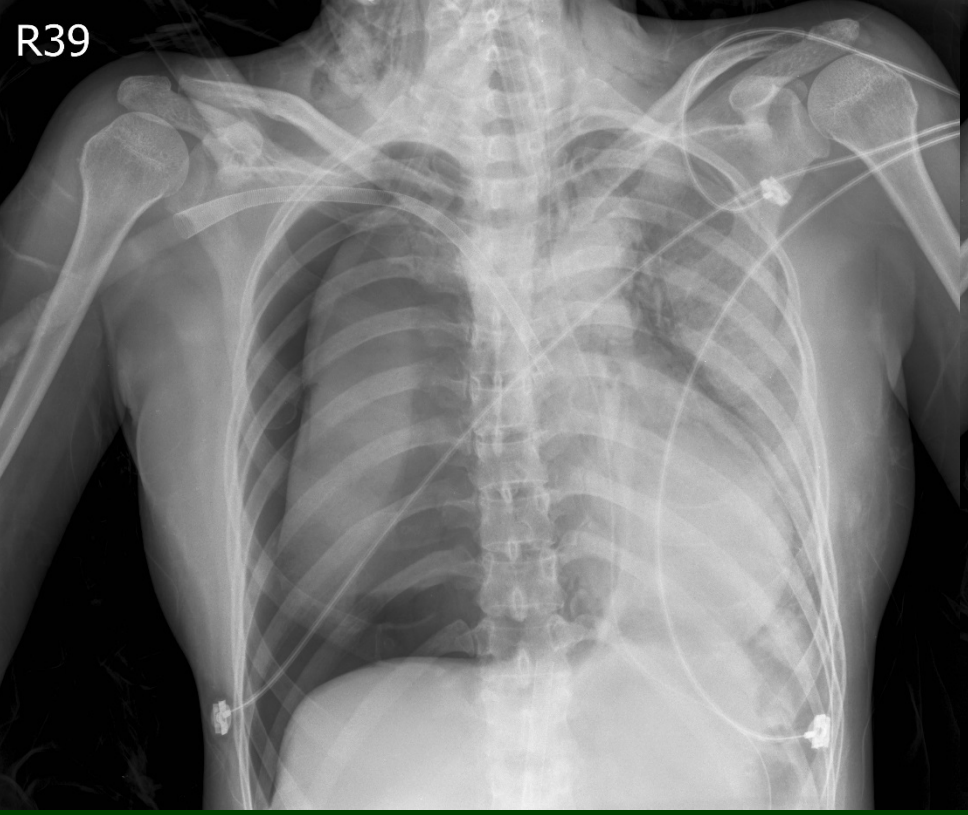

年/月/日
住院日數
手術日數一
手術日數二
手術日數三
生產日數
時間
2020/03
2020/04
22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10
檢陽
檢陽
檢陽
R. P. T.
70 160 41
60 140 40
50 120 39
40 100 38
30 80 37
20 60 36


R29
2020/03/22


R22
2020/03/24

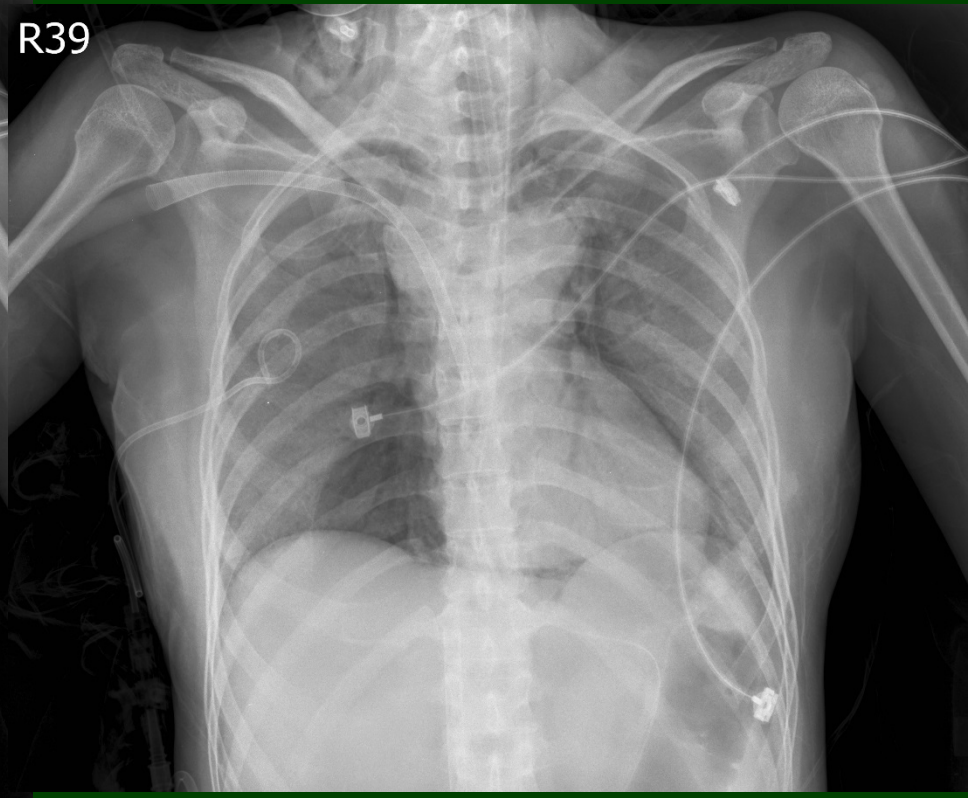

2020/03/27


R13
2020/03/30



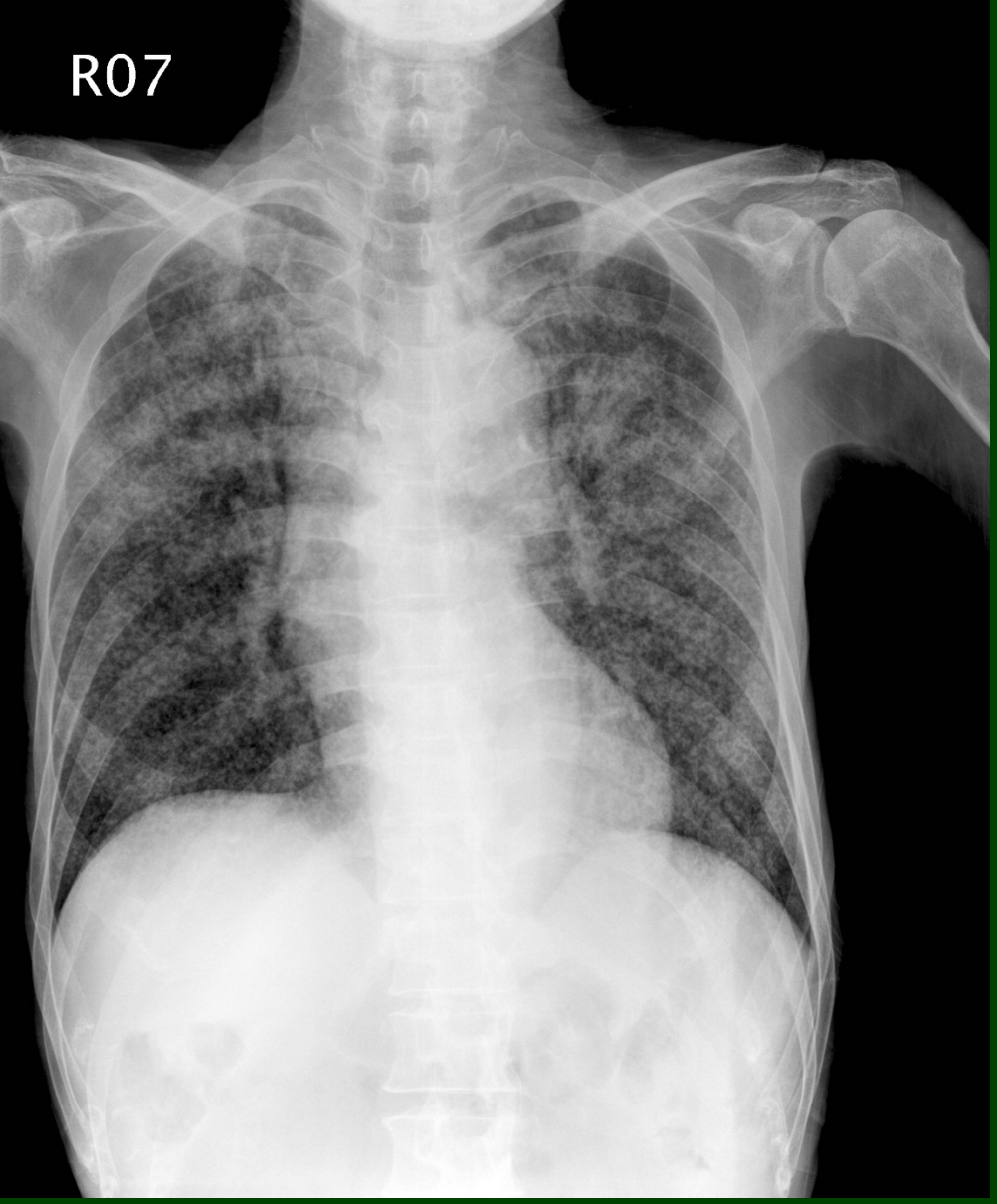
2018/10/18
00:52

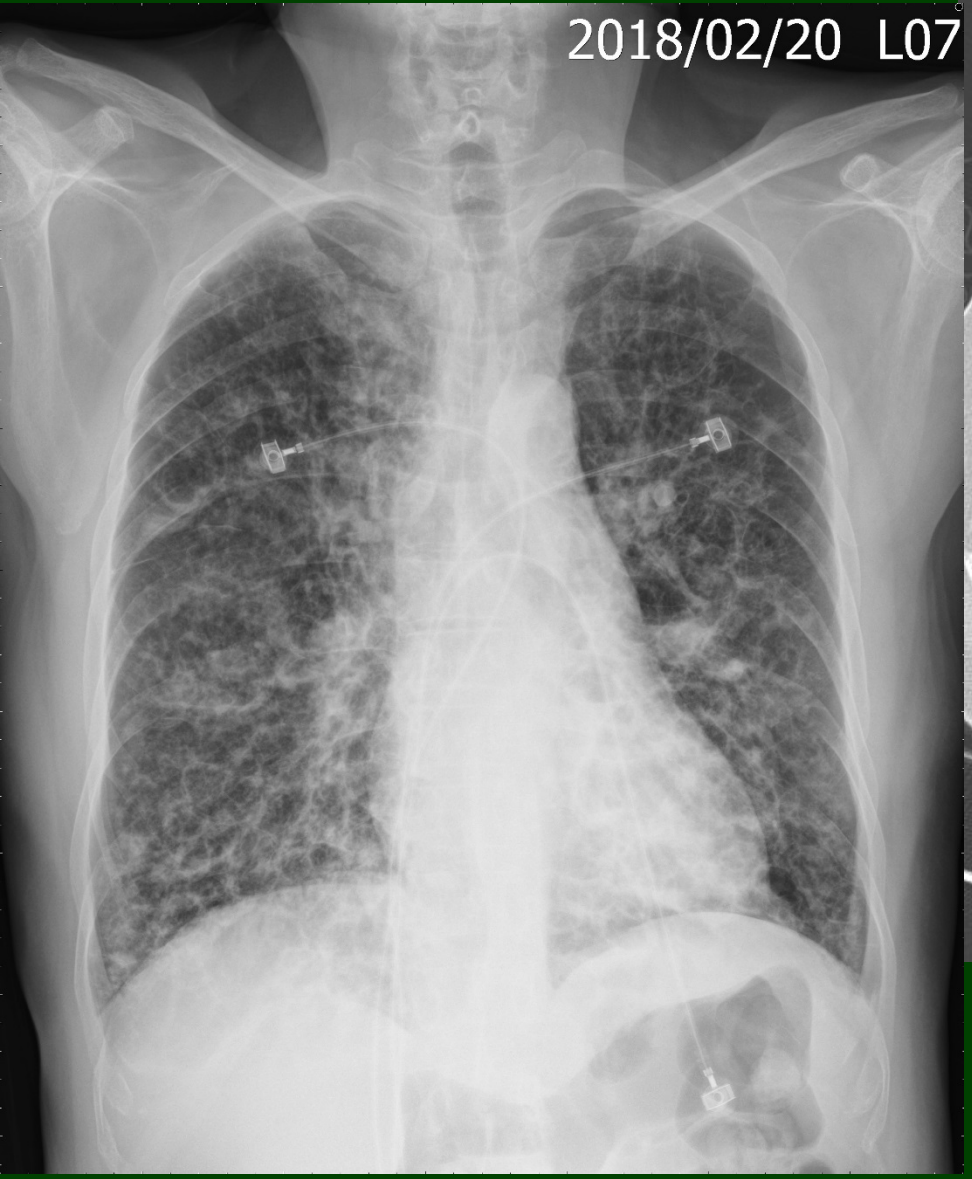
s/p ECMO

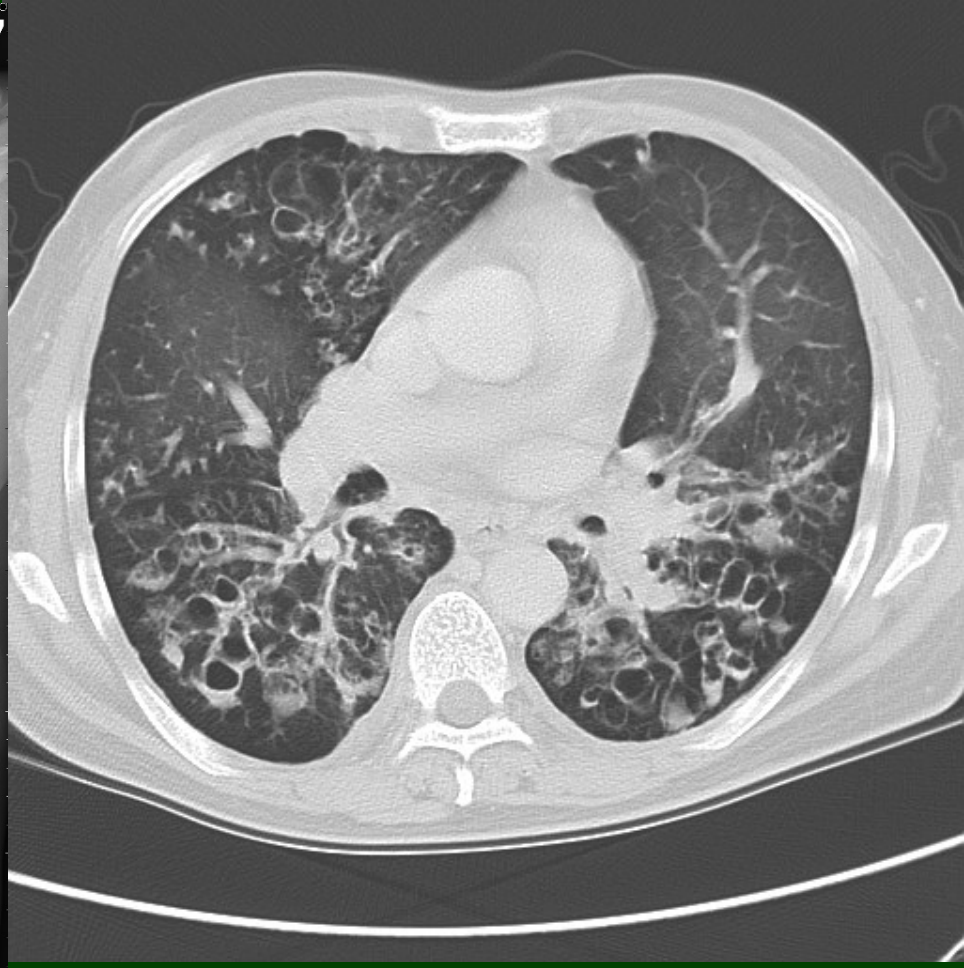


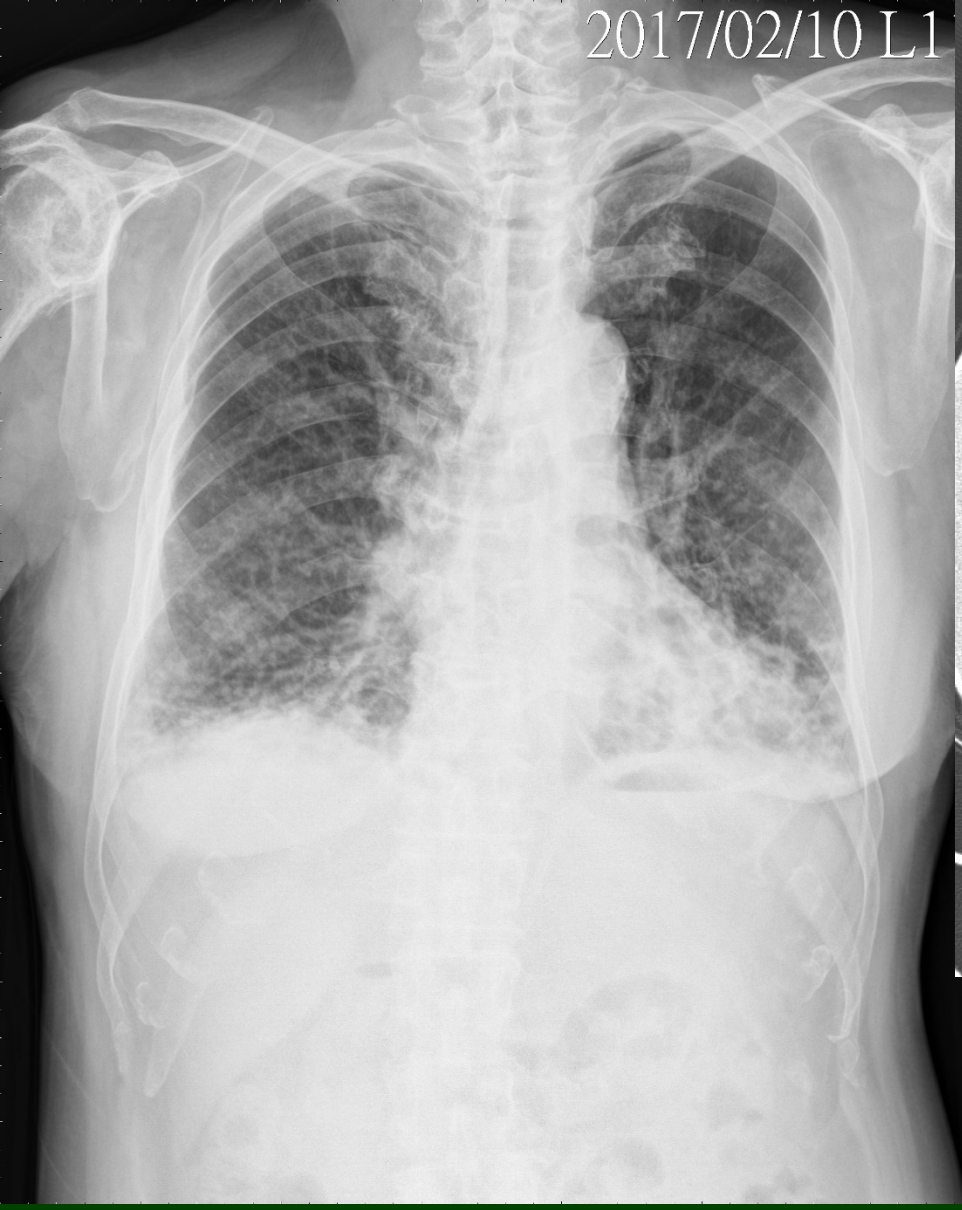
2018/10/18
01:59

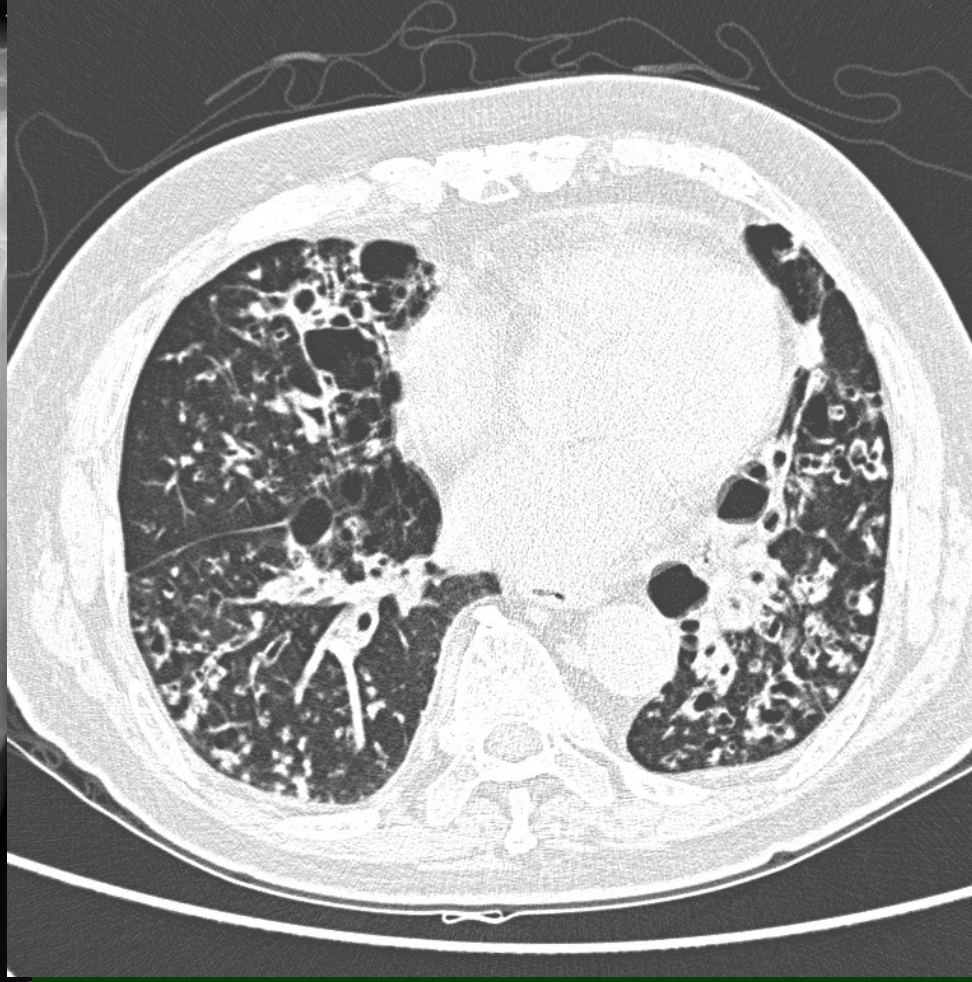
s/p Pig-tail Chest tube


R07


2018/02/20 L07

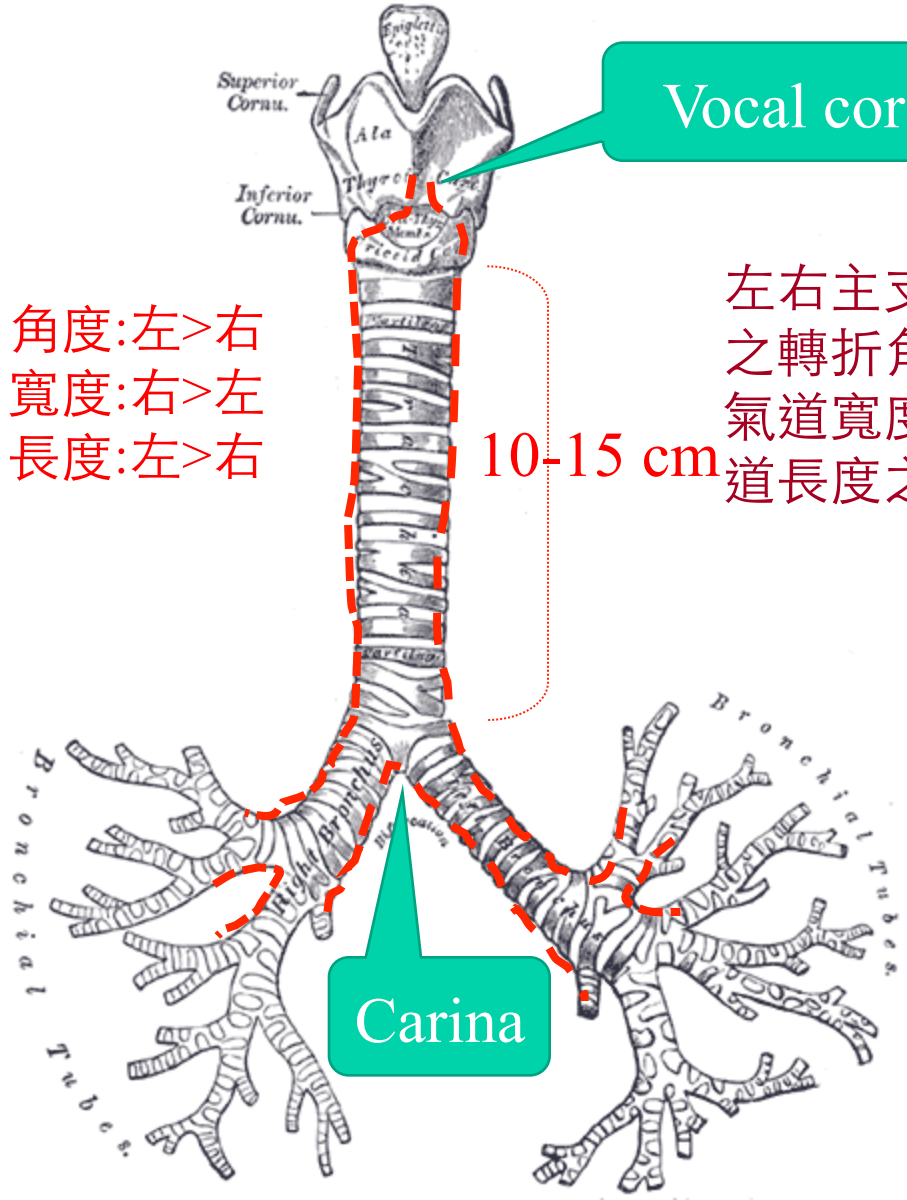


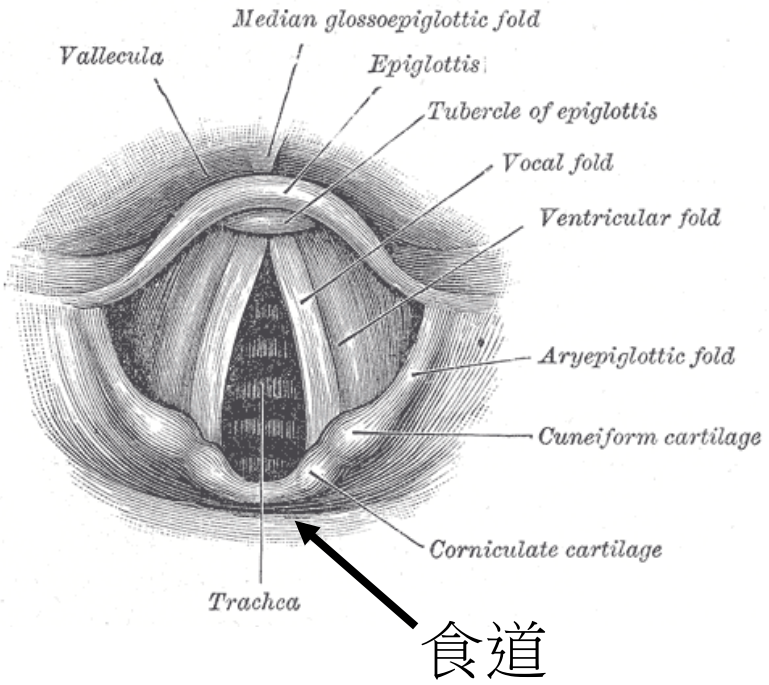

2017/02/10 L1



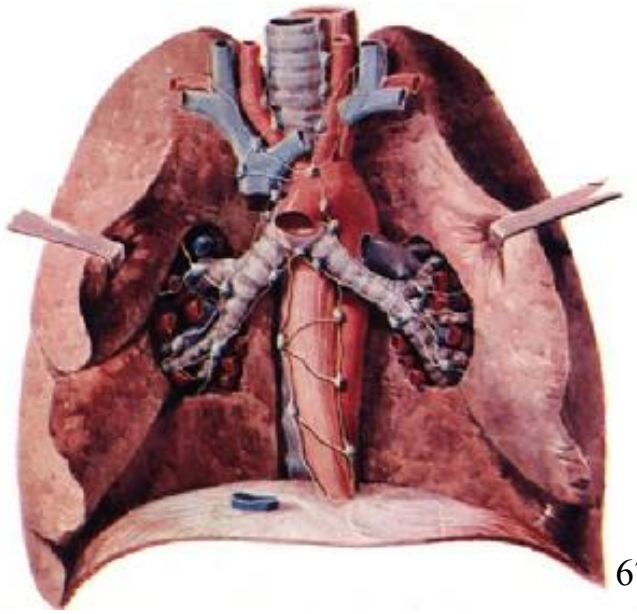
呼吸道的判讀重點

1. 地標：梨狀凹Pyriform sinus (Vocal cords地標), carina, second carina
2. 上下主軸：Trachea, main bronchus, upper lobe bronchus, truncus intermedius, lower lobe bronchus
3. 前後走向〔圓圈狀〕：B3 (anterior segmental of upper lobes) & B6 (superior segmental of lower lobes)
4. 氣管終點(carina)，地標:左右主支氣管交角處
5. 氣管起點(聲門下)，地標:聲門
6. 聲門之地標(pyriform sinus與氣管側壁)





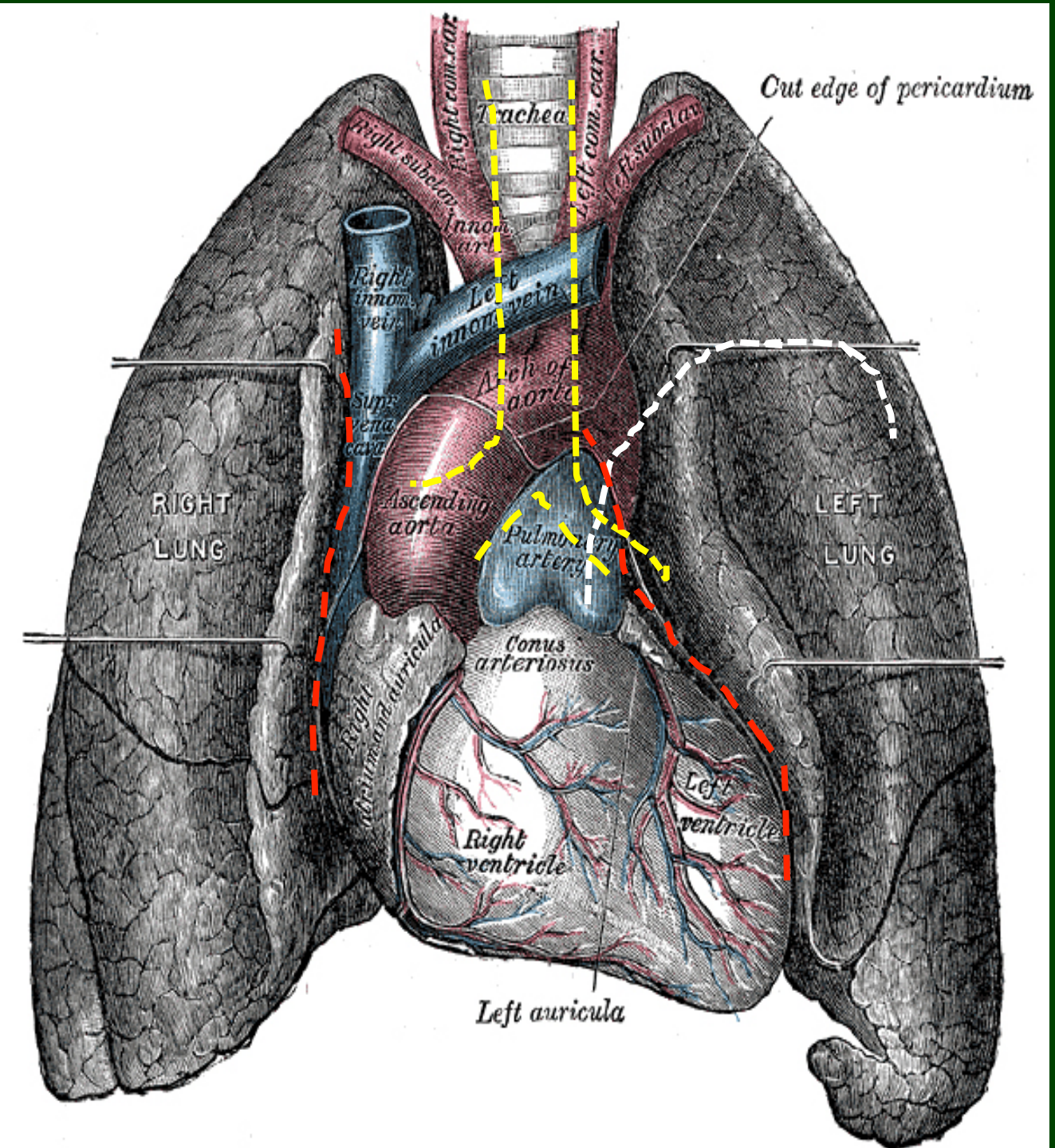
肺門



氣管軟骨環的形狀是C or O?

氣管背面是什麼？

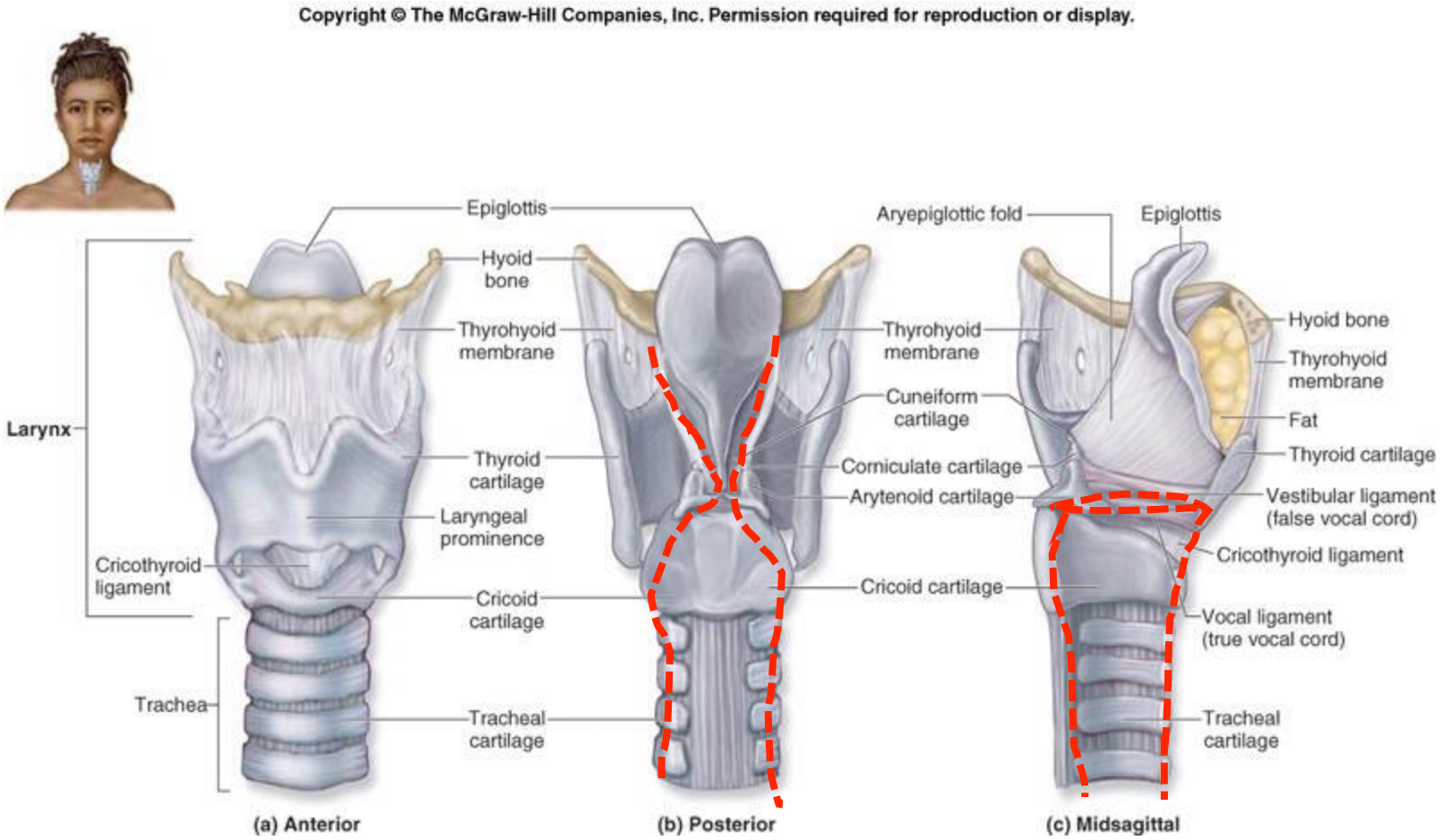
氣管的鄰居—主動脈、食道、上腔靜脈(相對位置)



氣管側線
Carina
縱隔右凸(SARA)
縱隔左凸(VAPA)

聲門處正面照與側面照之空氣氣柱成像形狀有何不同?

聲門下proximal subglottic area 的氣柱與distal trachea有何不同?



認識氣管一

三處地標為聲門、氣管隆凸、肺門。氣管長度10-15cm;

1.聲門可由氣柱狹窄處或梨狀凹底盤連線間接測得。

2.Carina主要由觀察左、右主支氣管交會處尋獲。

3.肺門主要是指肺動脈上下分枝分叉處，讀片時可由之氣管分叉處來定位

生理:

•氣管位於胸廓外與胸廓內，胸廓內段的氣管會受到胸內壓的影響(equal pressure point vs expiratory wheeze)。

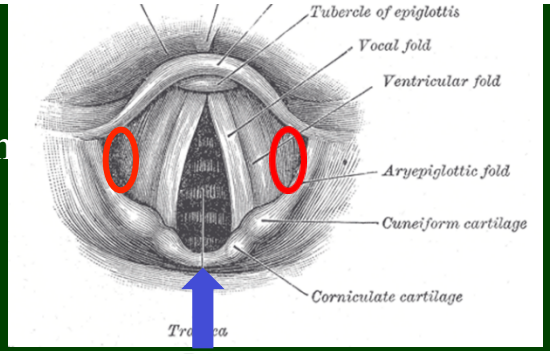
解剖

•學習氣道影像判讀建議先熟稔胸內外臟器的解剖相對關係(如升主動脈、主動脈弓、降主動脈、上腔靜脈、奇靜脈、肺動脈、食道、左心房、會厭軟骨、甲狀軟骨、梨狀凹等臟器與氣管相對位置)

呼吸道判讀重點:carina; vocal cord, main bronchi

2015/08/06 L28

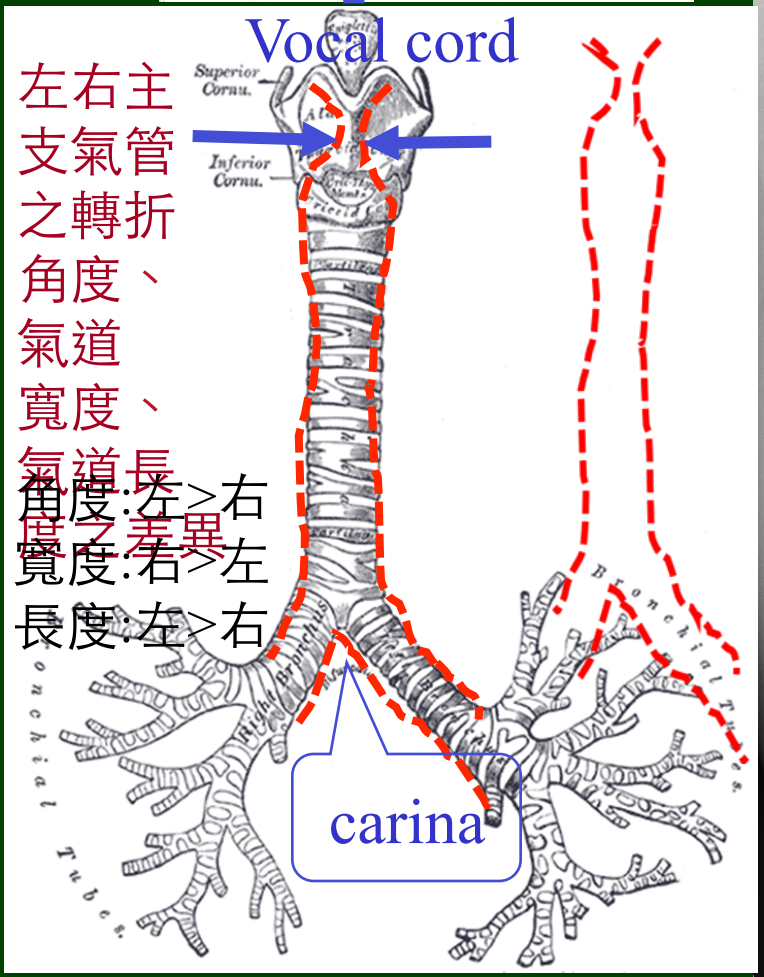
梨狀凹
Pyriform
sinus



Vocal cord

左右主支氣管之轉折角度、氣道寬度、氣道長度之差異

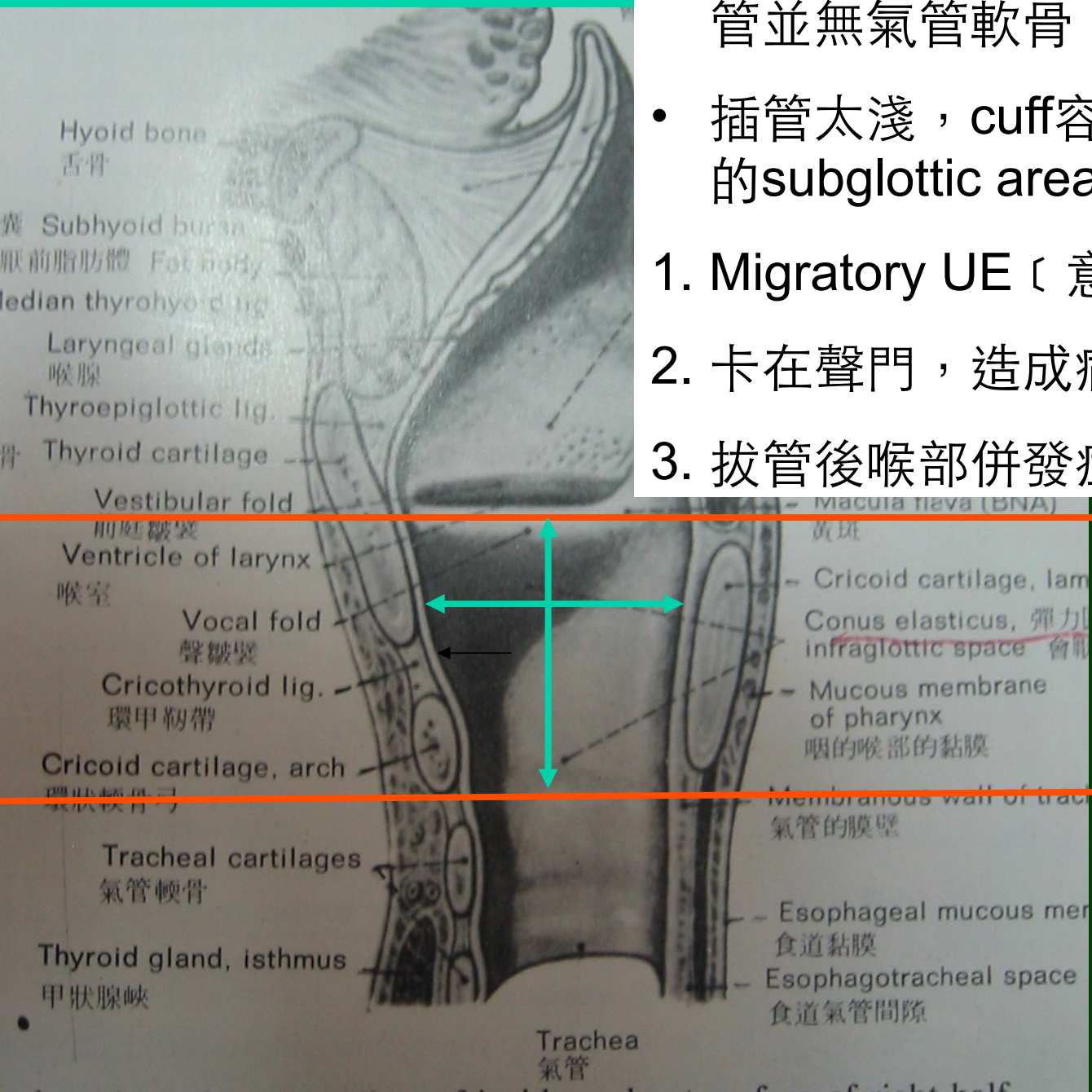
角度:左>右
寬度:右>左
長度:左>右



為什麼固定太淺，容易

- Subglottic space約有2公分長的氣管並無氣管軟骨，而且直徑也較大。
- 插管太淺，cuff容易往space較大的subglottic area migration而造成

1. Migratory UE〔意外滑脫〕
2. 卡在聲門，造成病人喉嚨痛自行拔管
3. 拔管後喉部併發症，甚至拔管失敗。



2 公分

不適當氣管插管四型八類
4 types, 8 subtypes

1. Esophageal intubation (食道內插管)
2. Bronchial intubation (支氣管內插管)
    1. Proximal to carina
    2. Distal to carina
3. Subglottic intubation (聲門下插管)
    1. Cuff overlapped with subglottic space
    2. Cuff totally in the subglottic space
    3. Cuff compressing on the vocal cords
4. Oropharyngeal intubation (口咽腔內插管)
    1. ETT tip distal to vocal cords
    2. ETT tip proximal to vocal cords

作者：吳錦桐 2007

不適當氣管插管類型：四型八類

1. Esophageal intubation (食道內插管)
2. Bronchial intubation (支氣管內插管)
   1. Proximal to carina
   2. Distal to carina
3. Subglottic intubation (聲門下插管─ETT 太淺，UE高危險群)
   3-1. Cuff partially in the subglottic space
   3-2. Cuff completely in the subglottic space
   3-3. Cuff overriding on the vocal cords
4. Oropharyngeal intubation (口咽腔內插管，其實已經UE了)
   4-1. ETT tip distal to vocal cords
   4-2. ETT tip proximal to vocal cords

誤入歧途(迷途知返)

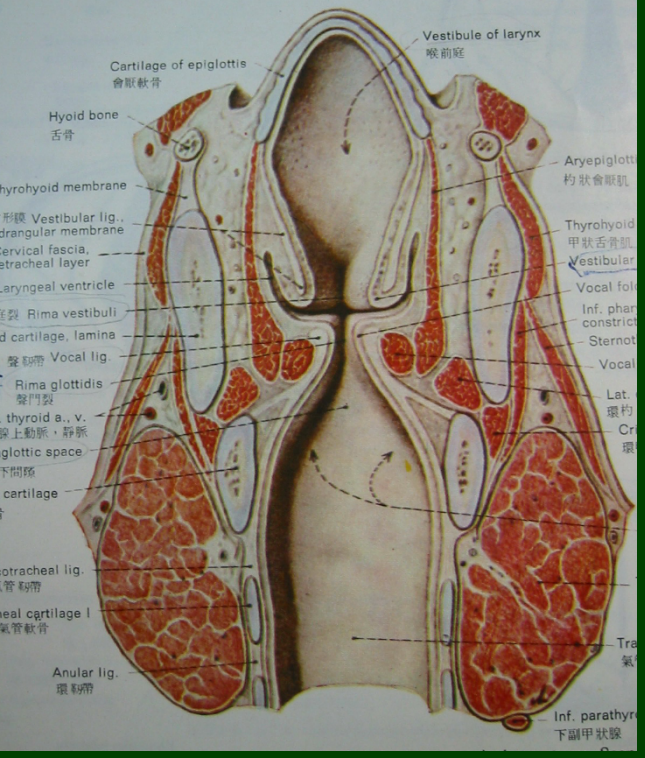
老謀深算(返璞歸真)

涉世未深(更上層樓)

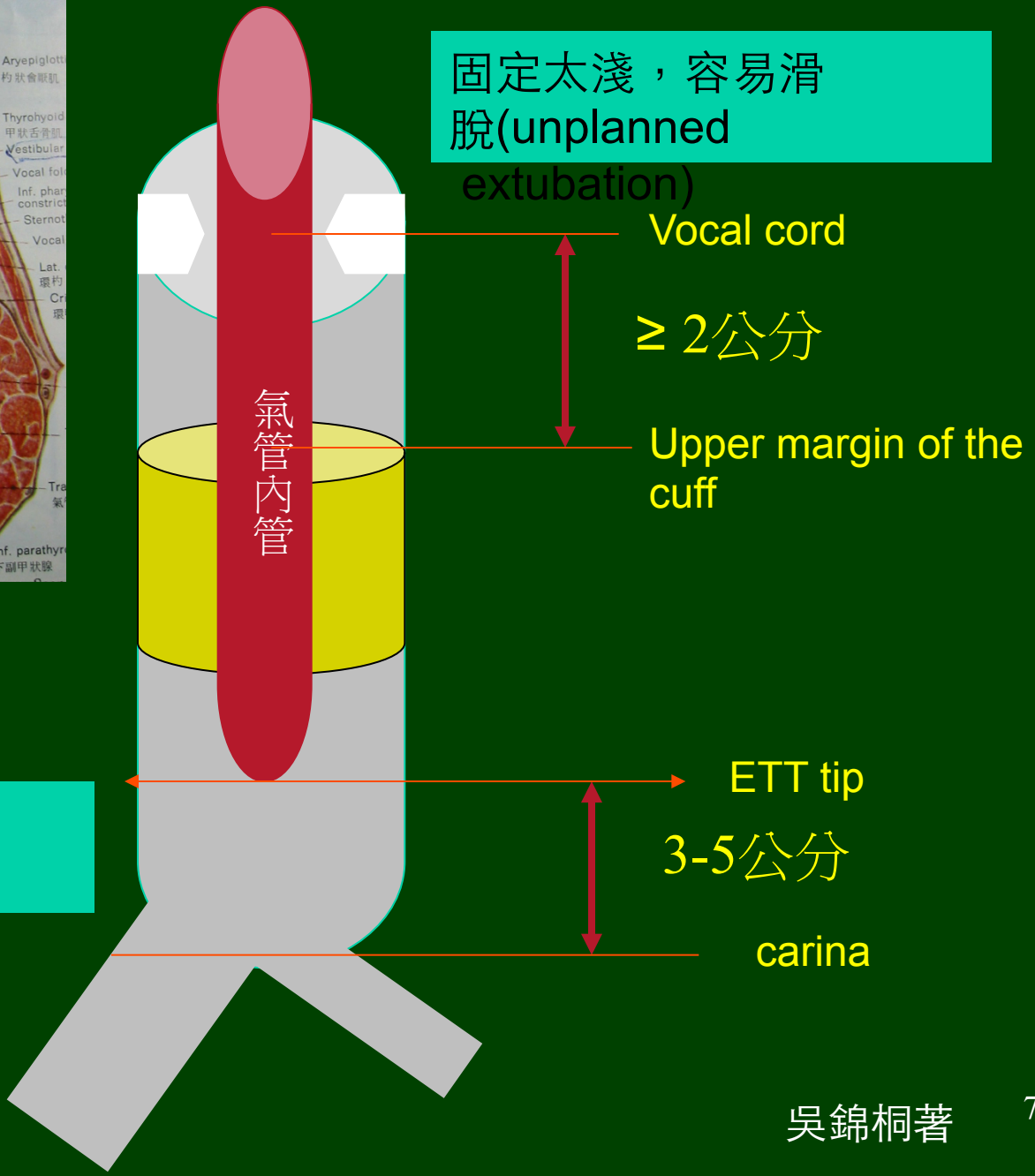
狀況之外(何去何從)

作者：吳錦桐 2007

如何利用胸部X光決定人工氣道的適當深度？

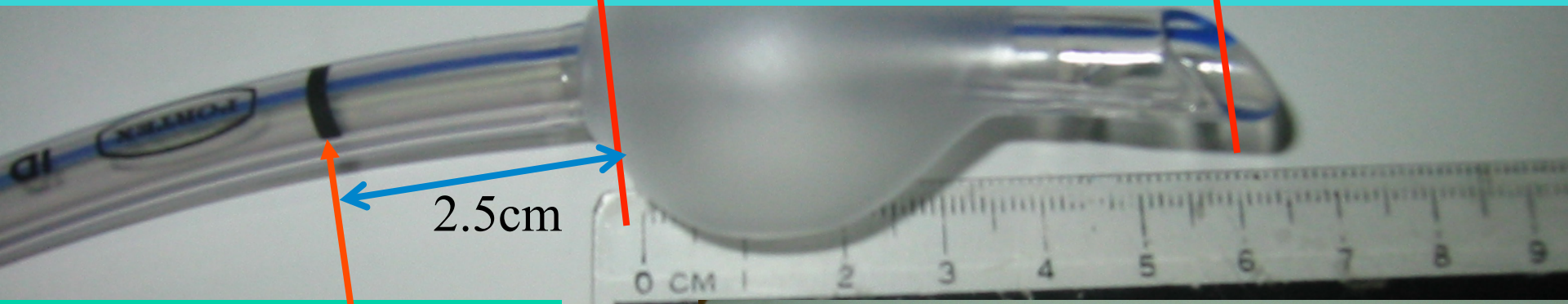


固定太淺，容易滑脫(unplanned extubation)

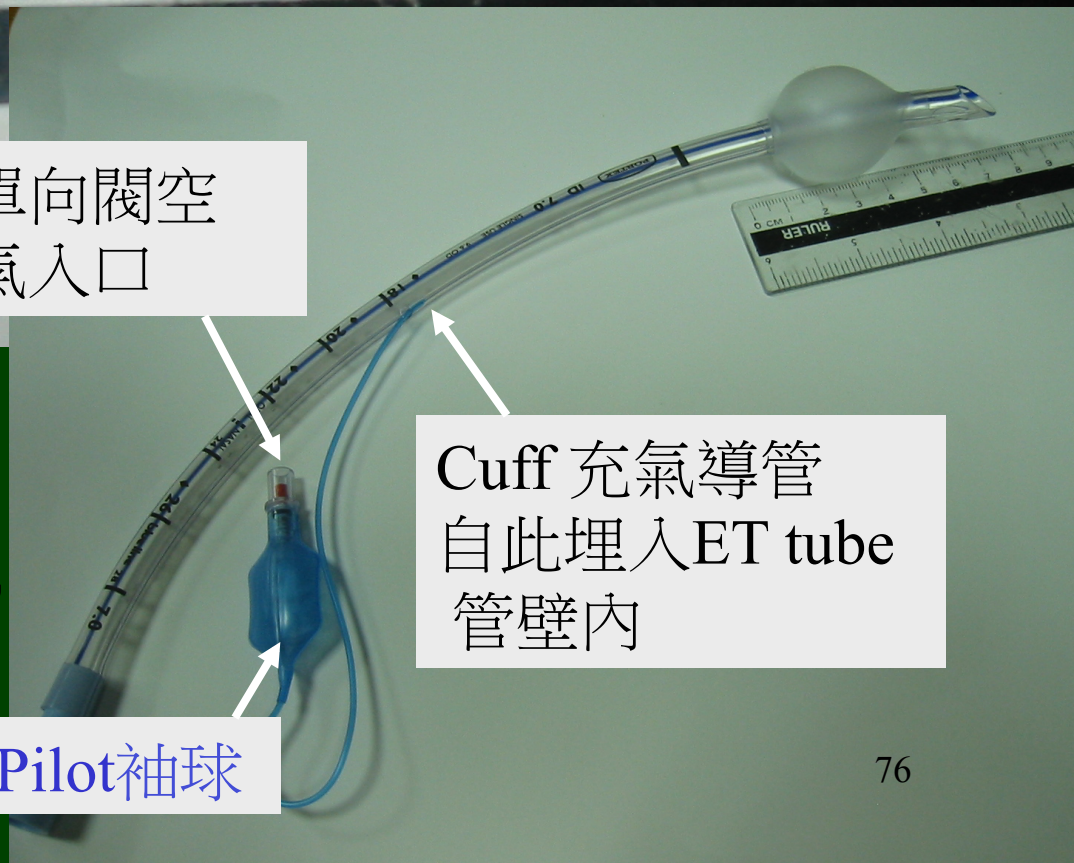


固定太深，容易支氣管內插管(bronchial intubation)

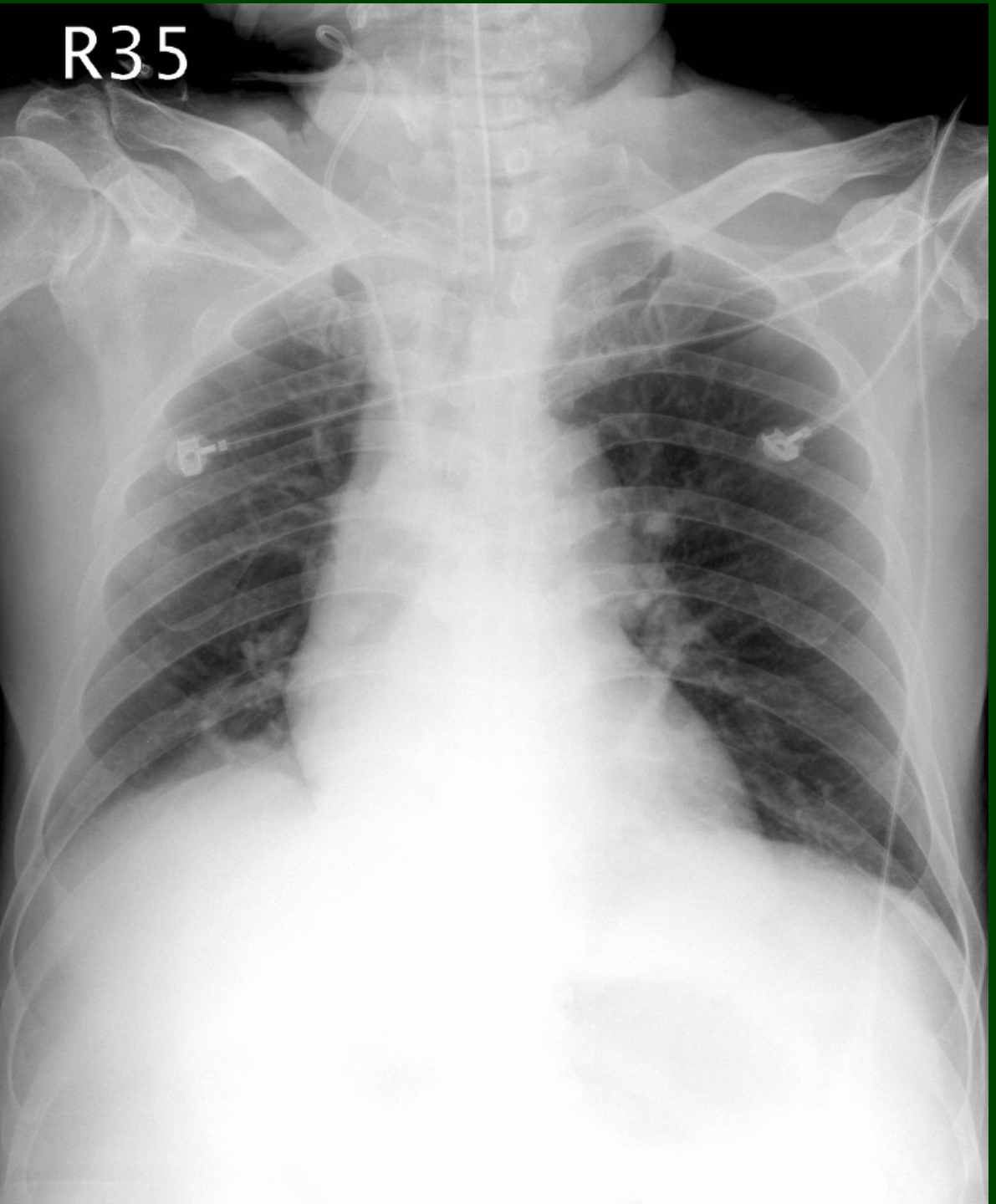
自人工氣道顯影線末端至cuff上緣約有6公分長，cuff再量到黑色標線處約2.5公分。

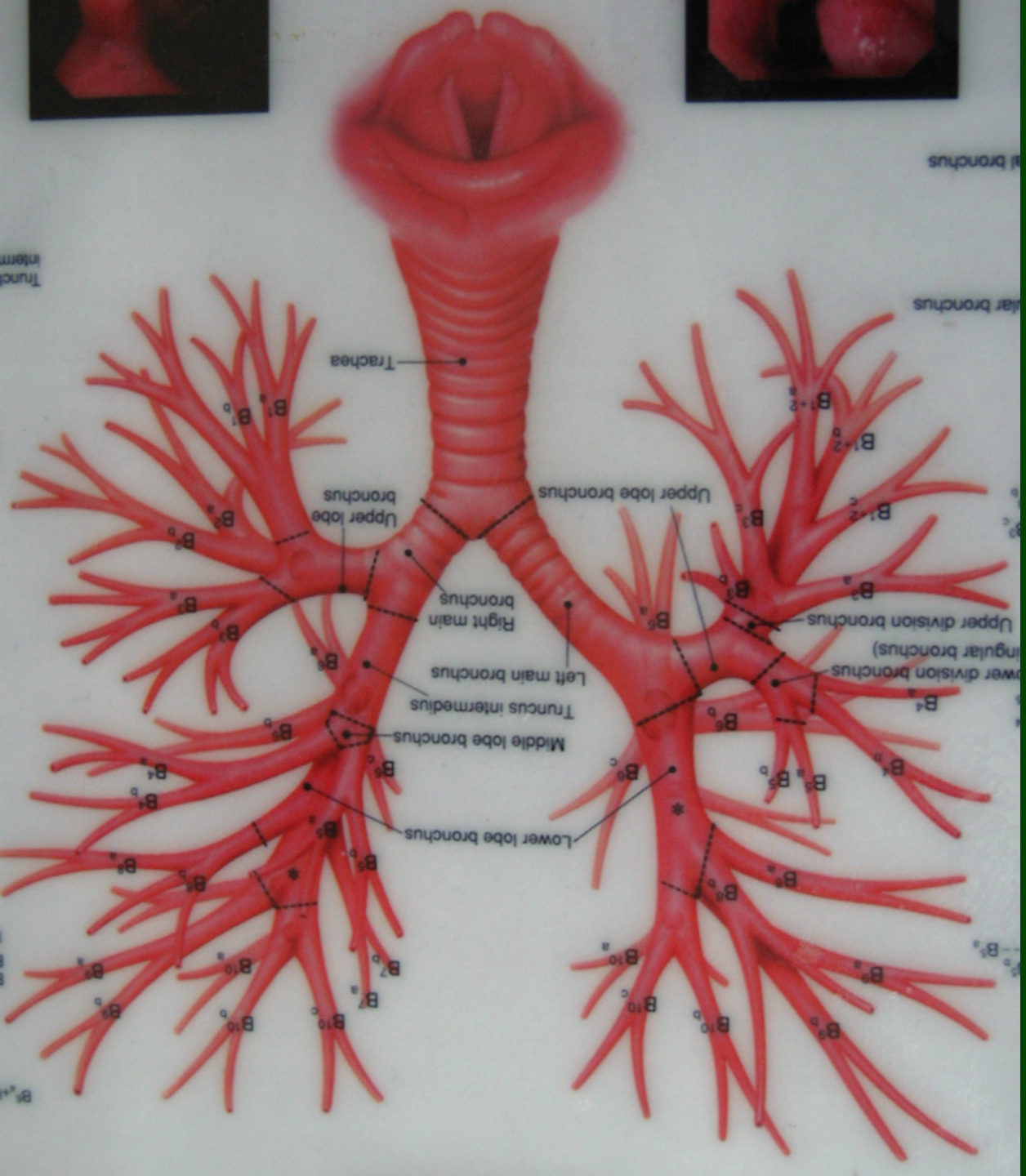


插管時，此黑色標線約在vocal cords位置。



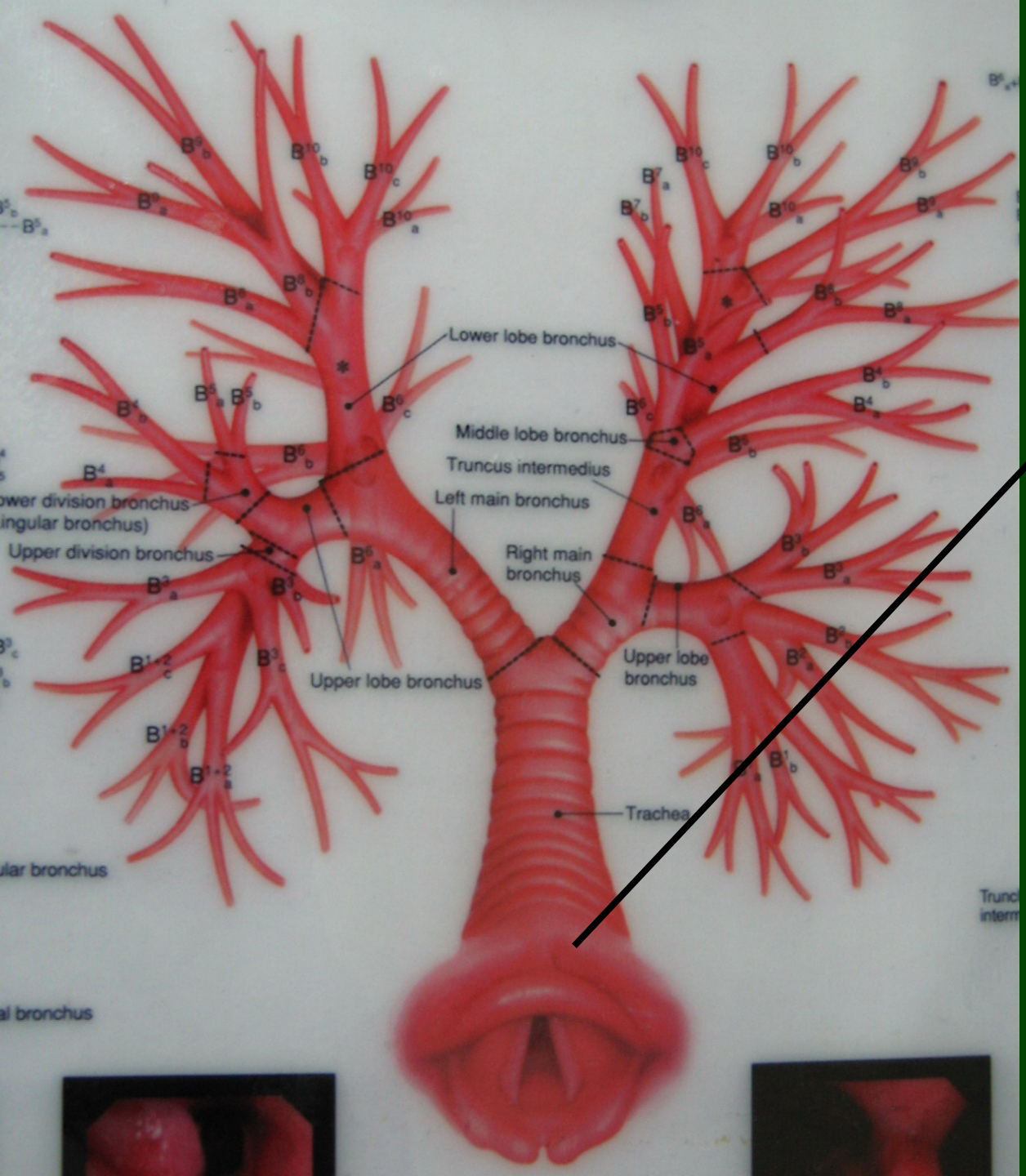
因為從vocal cords往下約2公分內的氣管並無軟骨環，space也較大，cuff較易往space大的地方滑動。

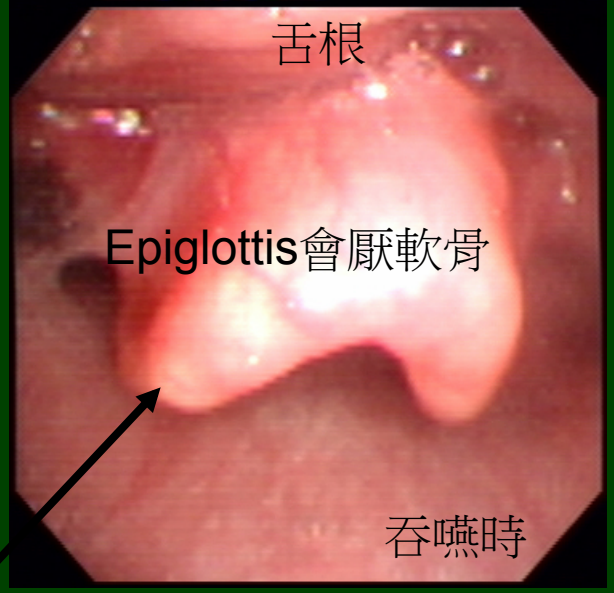

R35



氣管樹狀圖〔倒立大樹〕

1. Glottis
2. Trachea〔軟骨環〕
3. Carina
4. Right main bronchus
5. Left main bronchus
6. Second carina〔右、左〕
7. RUL
8. TI (truncus intermedius)
9. RML & RLL
10. LUL
11. Upper division
12. Lower division (lingual lobe)
13. LLL

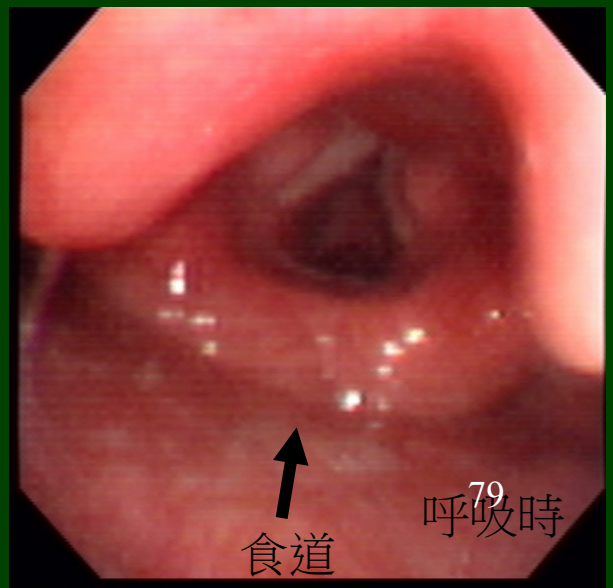




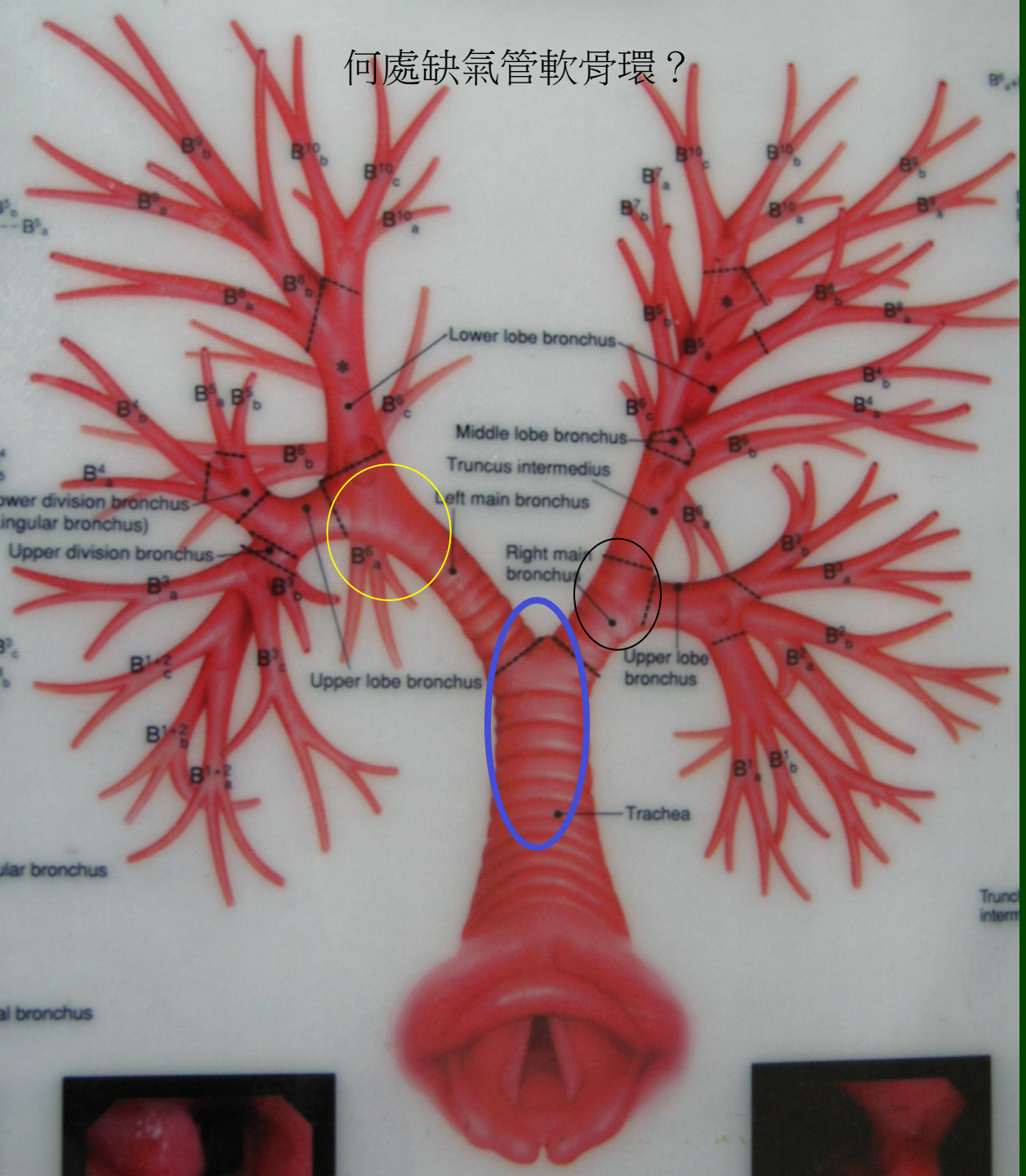
Vocal cords聲帶

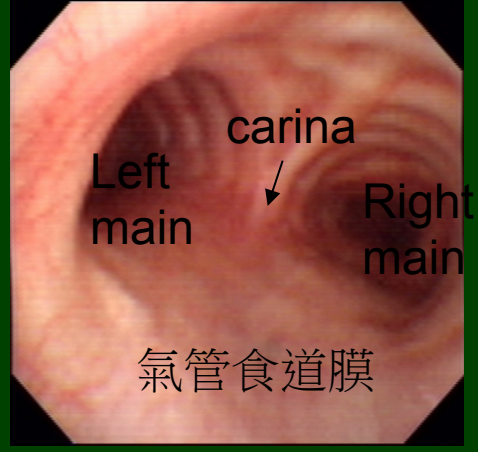
False cords

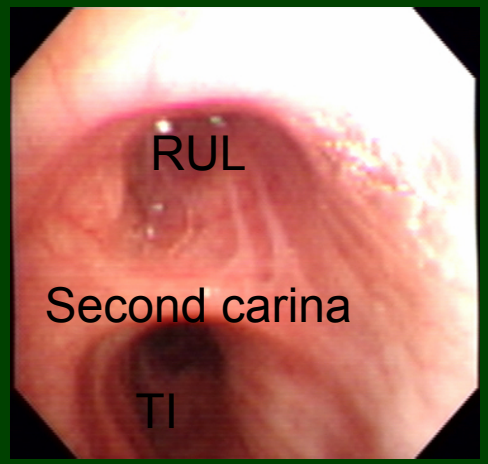
Pyriform sinus梨狀窩

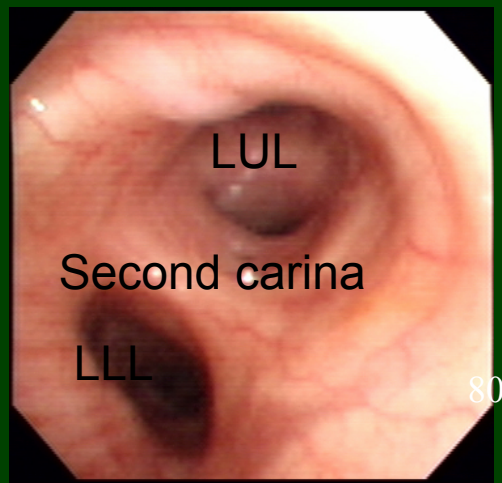


何處缺氣管軟骨環？

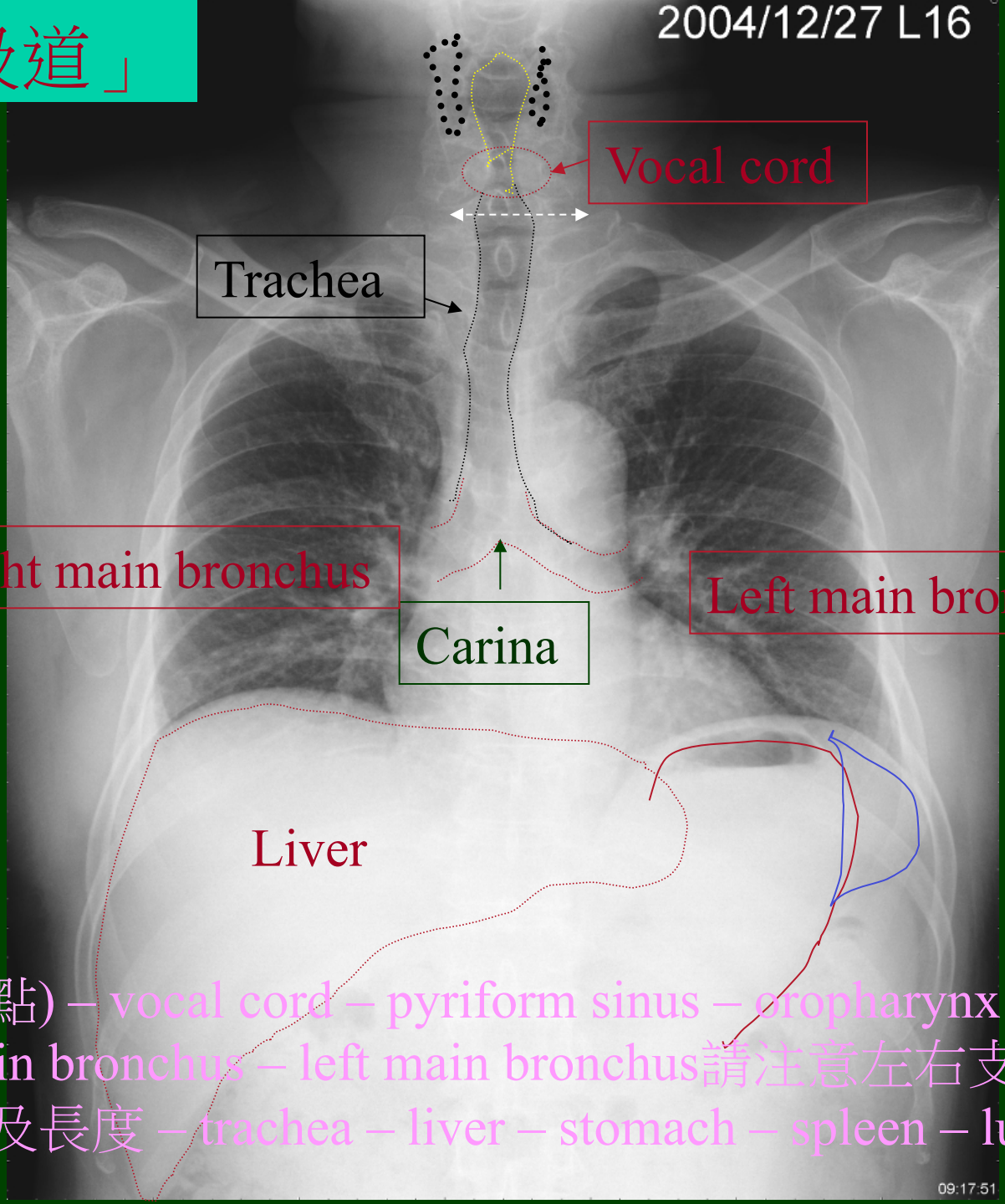

Lower lobe bronchus
Middle lobe bronchus
Truncus intermedius
Left main bronchus
Right main bronchus
Upper division bronchus
Upper lobe bronchus
Upper lobe bronchus
Trachea


carina
Left main
Right main
氣管食道膜

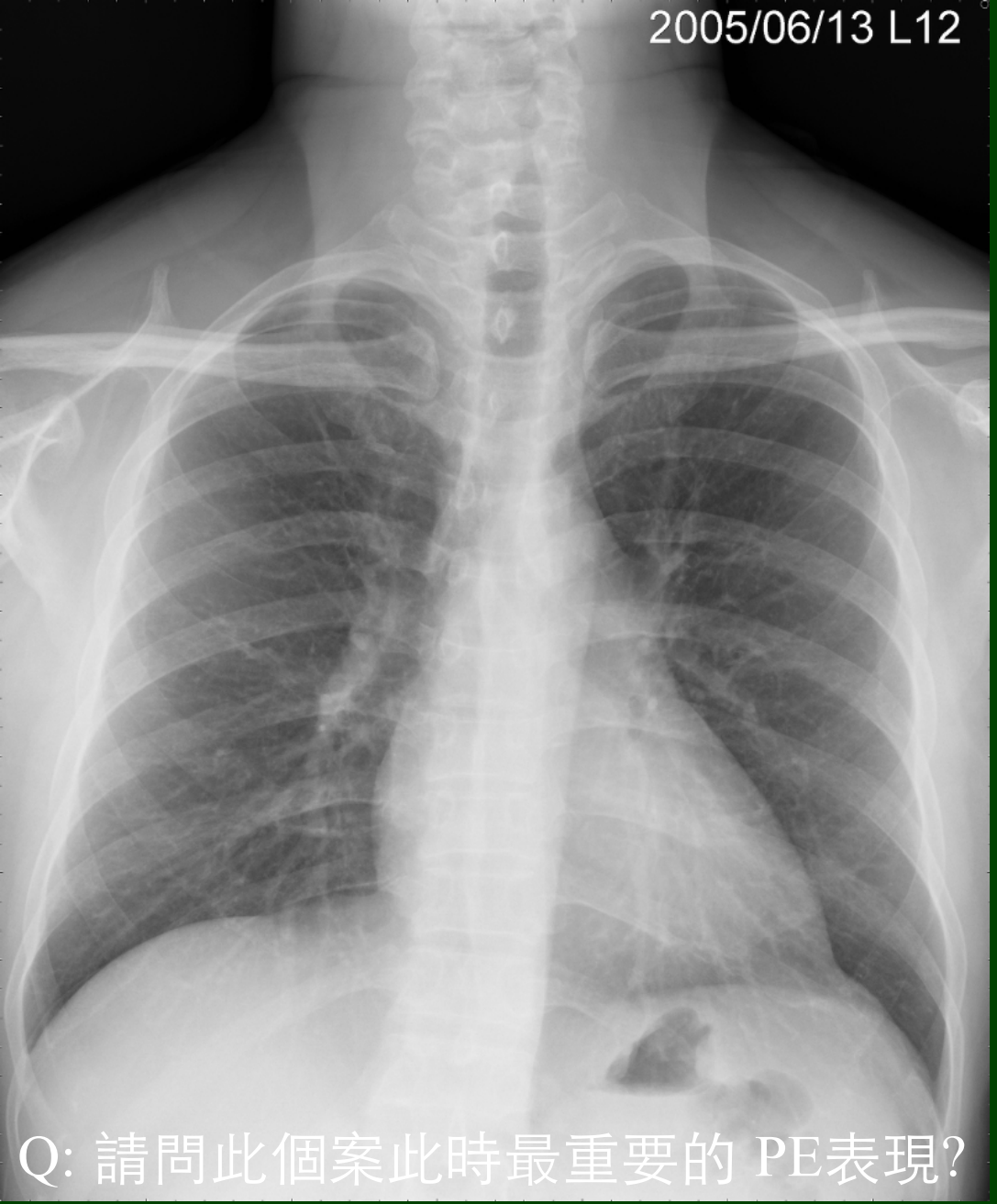

RUL
Second carina
TI


LUL
Second carina
LLL

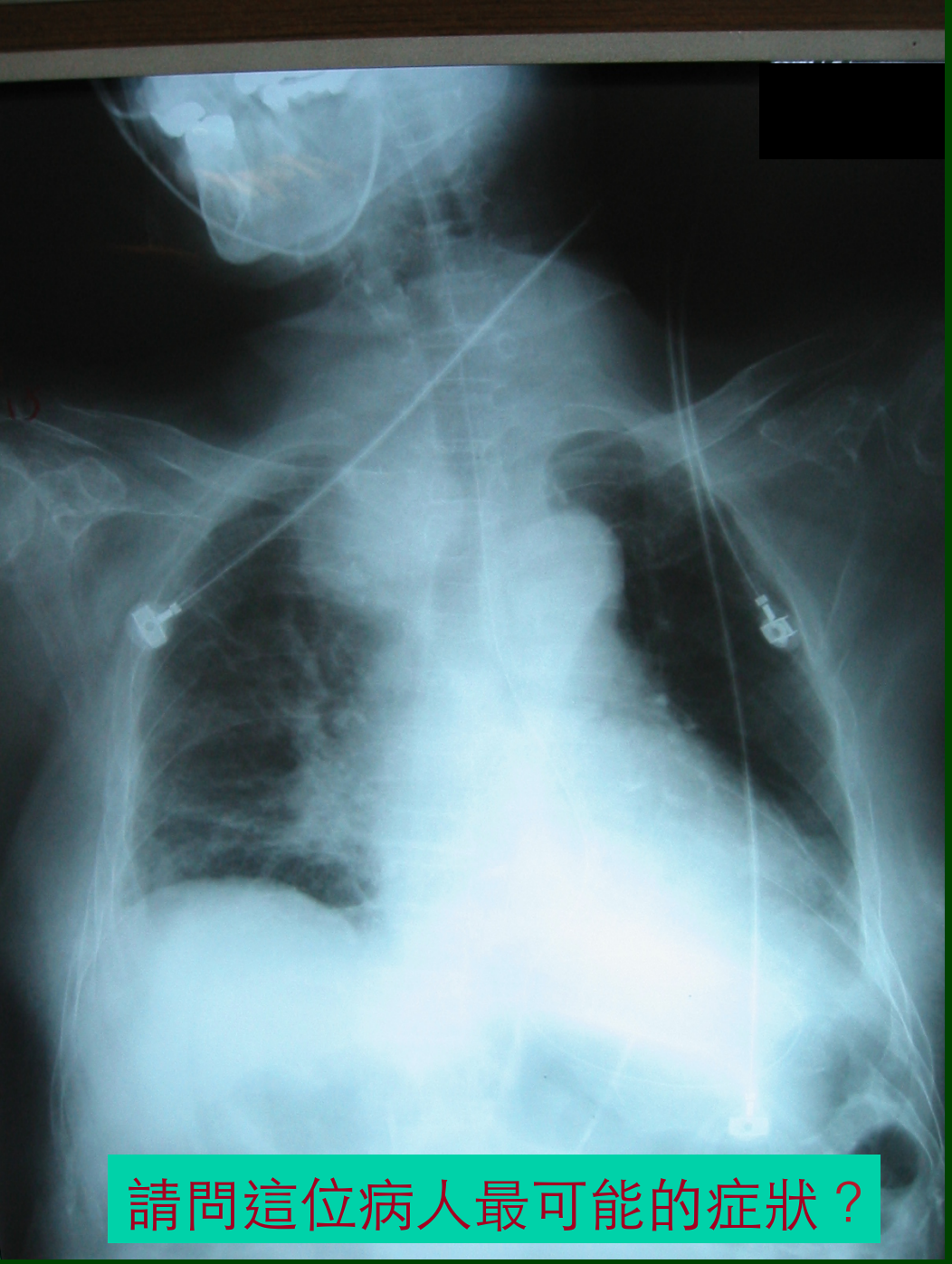
辨認「呼吸道」及橫膈下



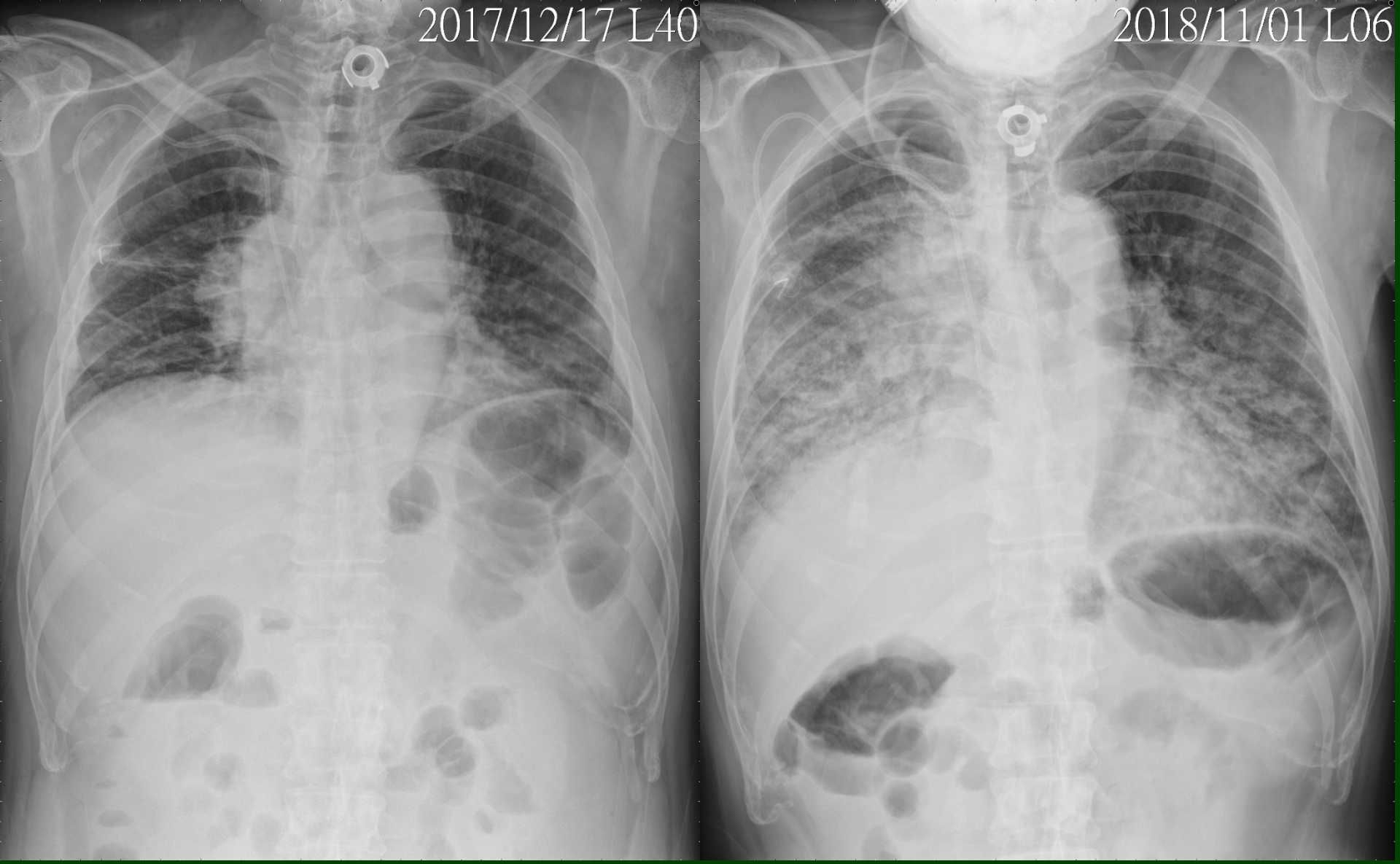
Carina(氣管終點) – vocal cord – pyriform sinus – oropharynx –氣管起點> right main bronchus – left main bronchus請注意左右支氣管的角度、內徑及長度 – trachea – liver – stomach – spleen – lung fields

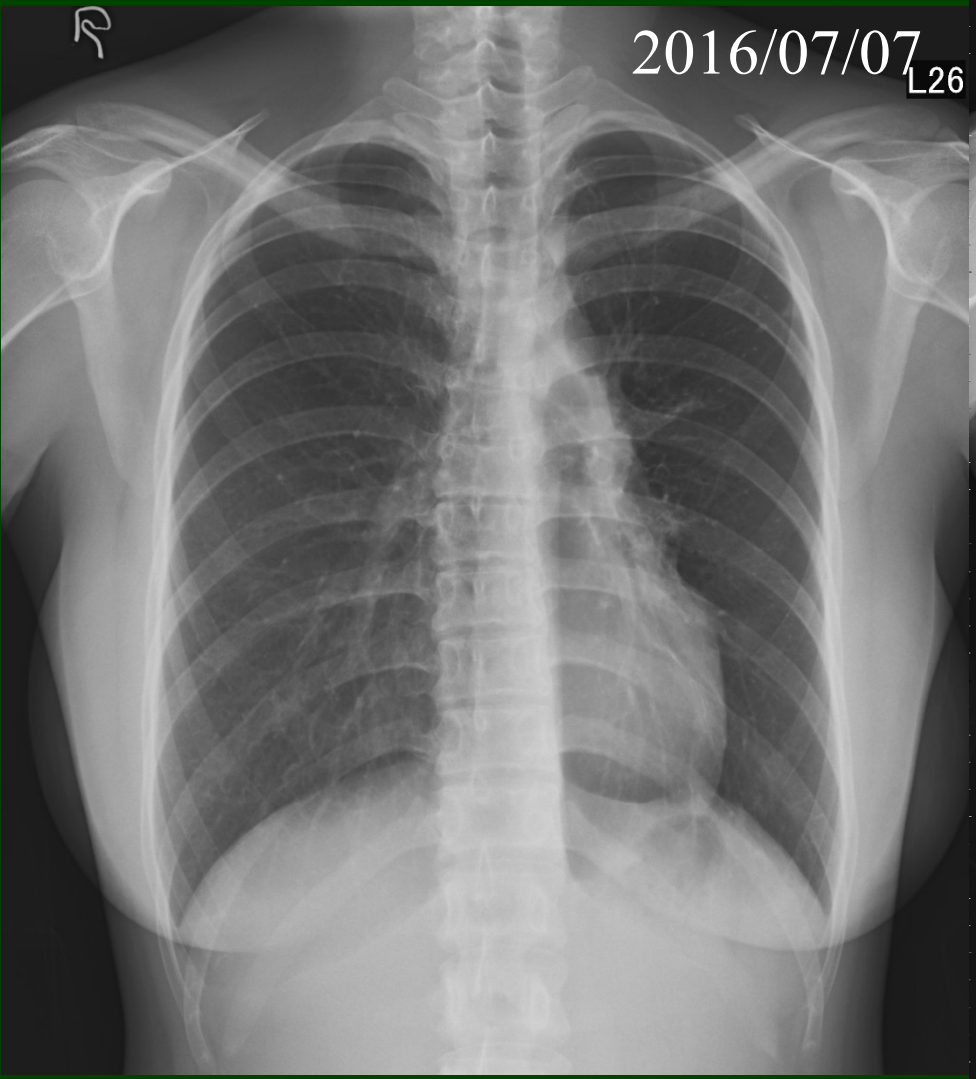


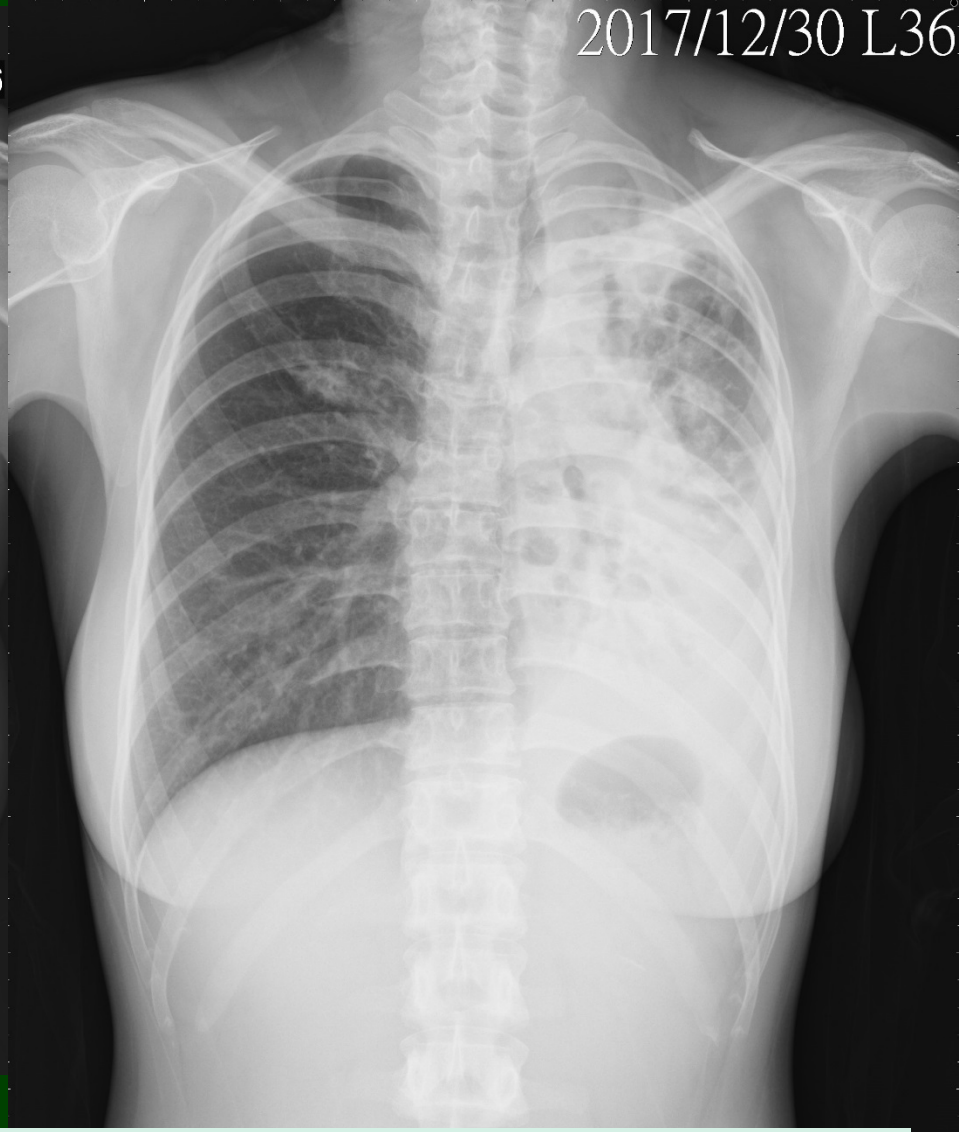
Q: 請問此個案此時最重要的 PE表現?



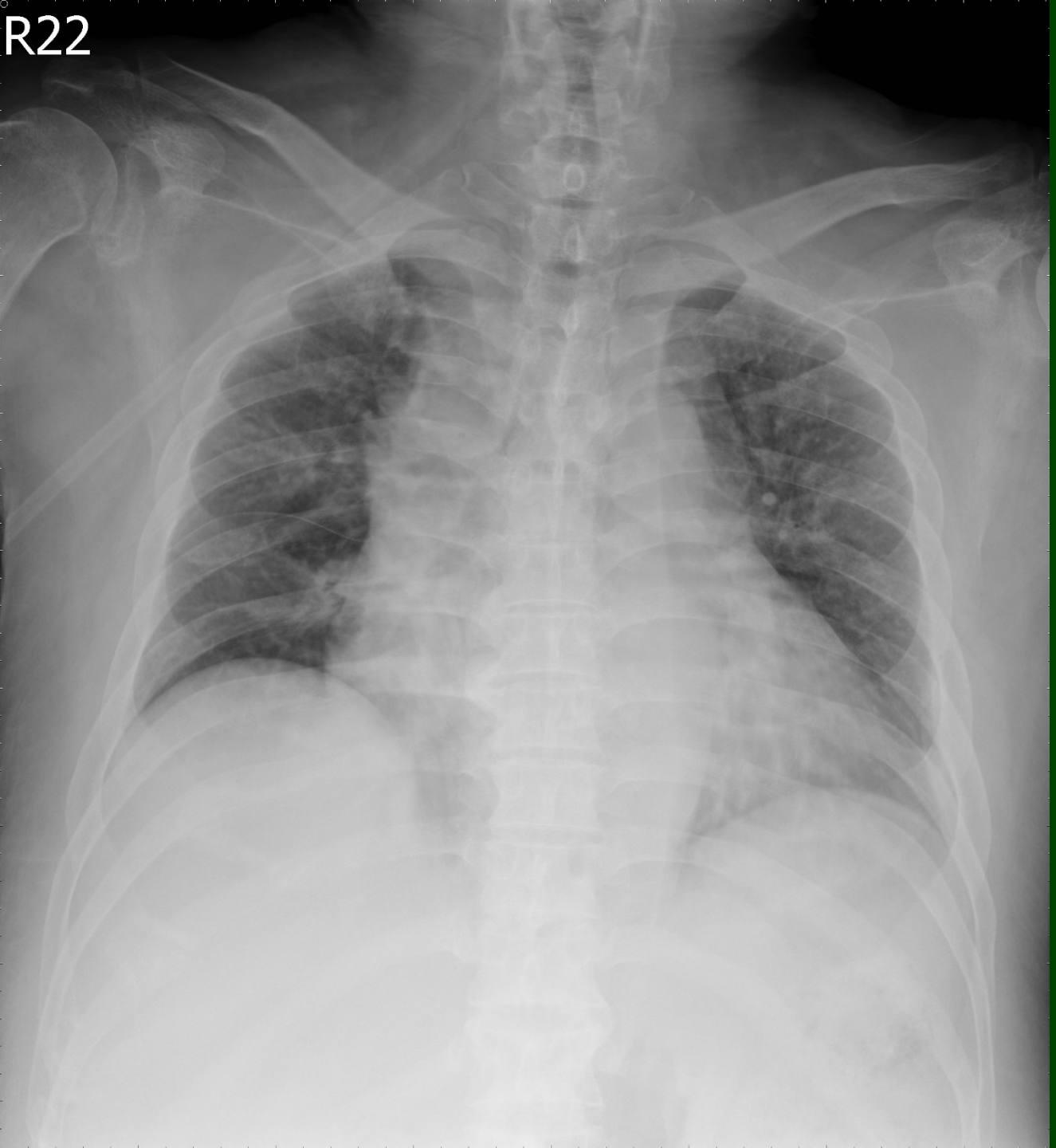
請問這位病人最可能的症狀？

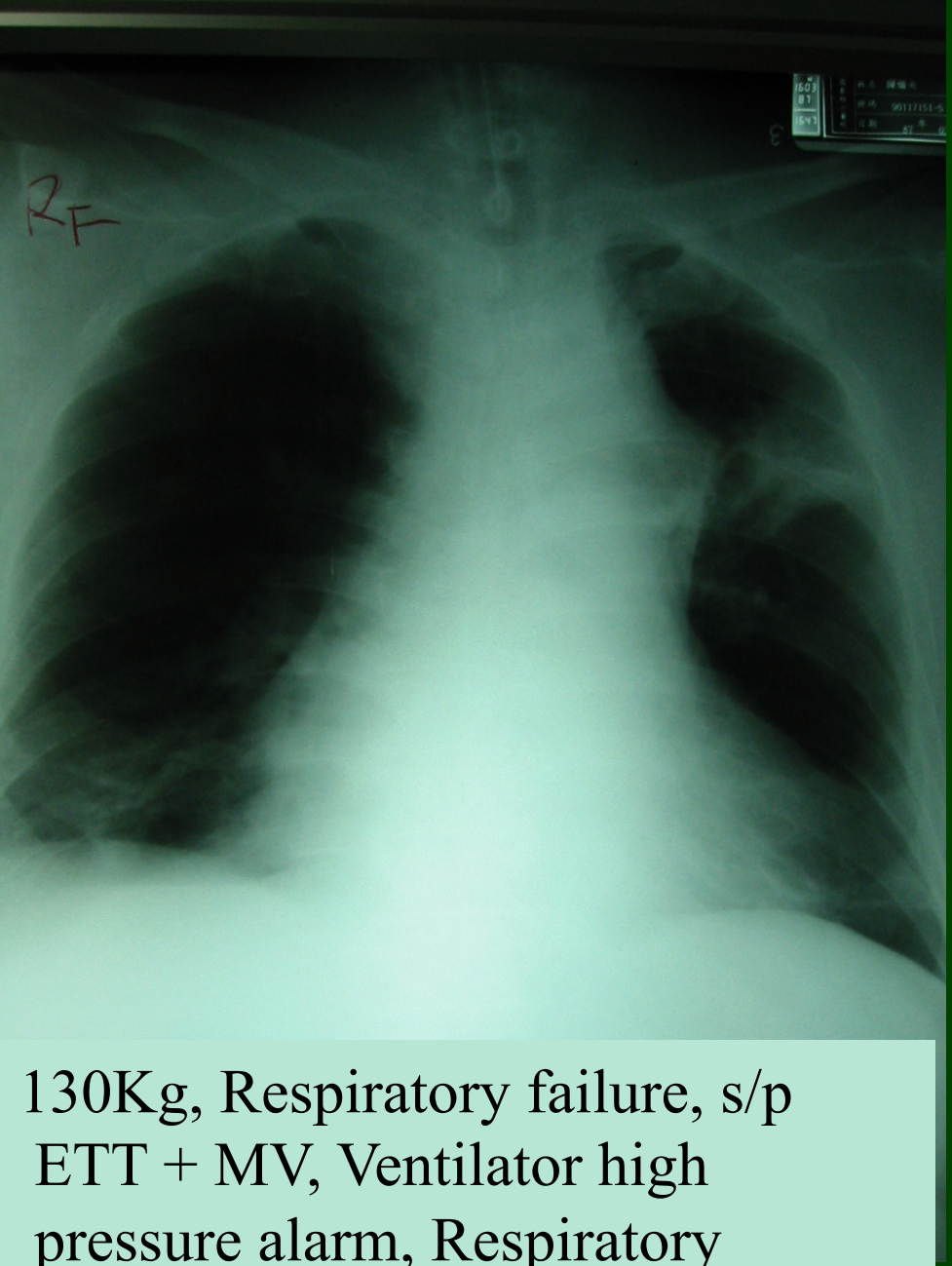

2017/12/17 L40
2018/11/01 L06



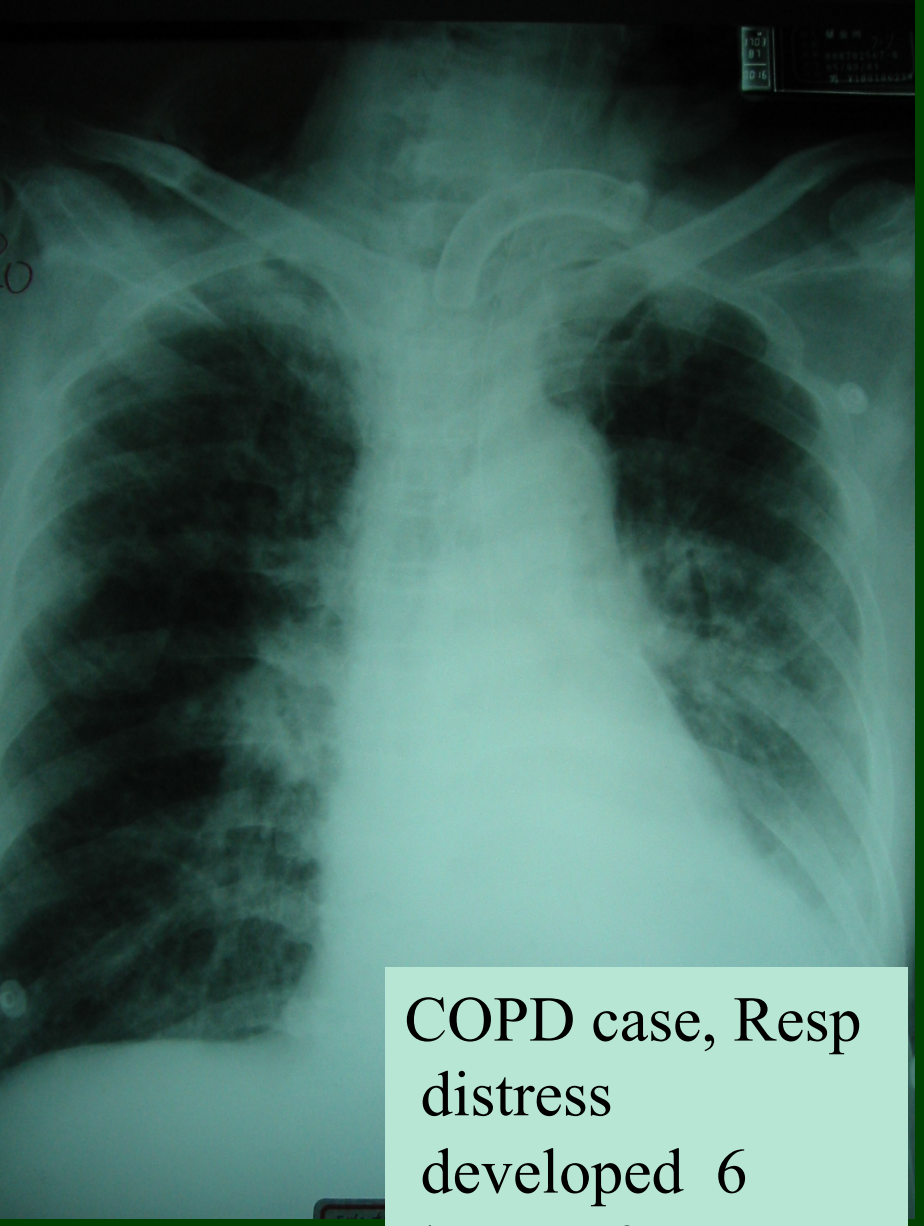


Hx of pulmonary Tb, s/p anti-Tb treatment in 2005 at another Hospital
Wheezing dyspnea developed from 2016, treated as asthma at AIR

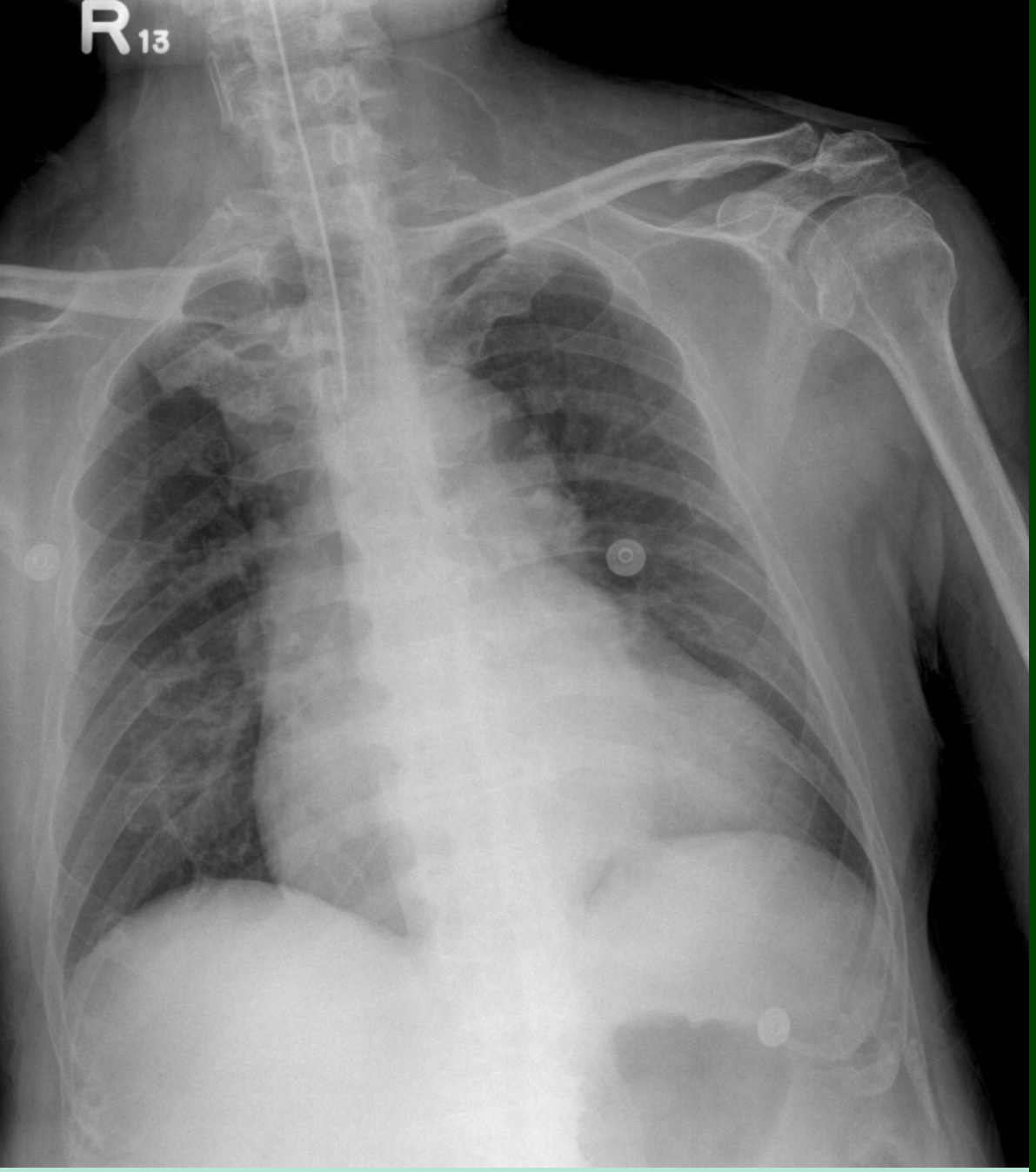

R22



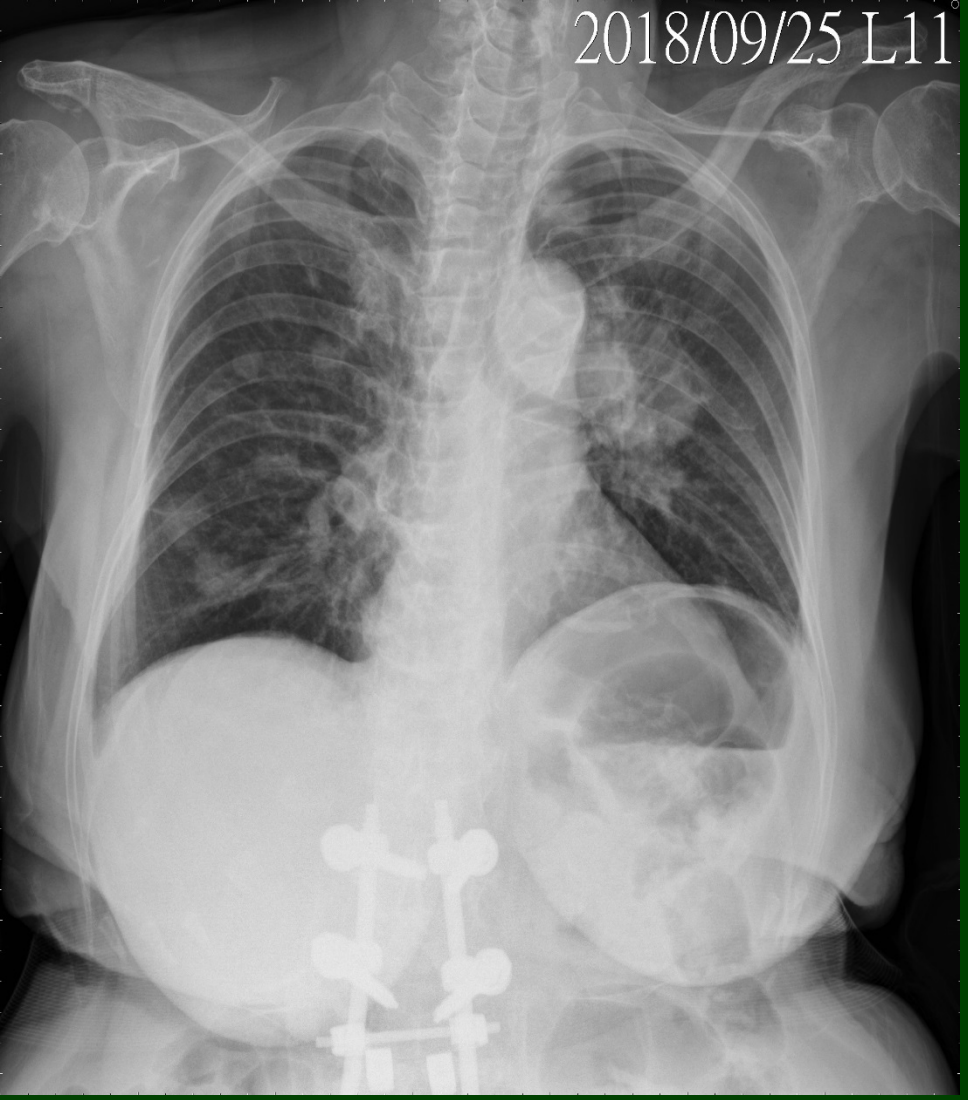
130Kg, Respiratory failure, s/p ETT + MV, Ventilator high pressure alarm, Respiratory distress



COPD case, Resp distress developed 6 hours after tracheostomy

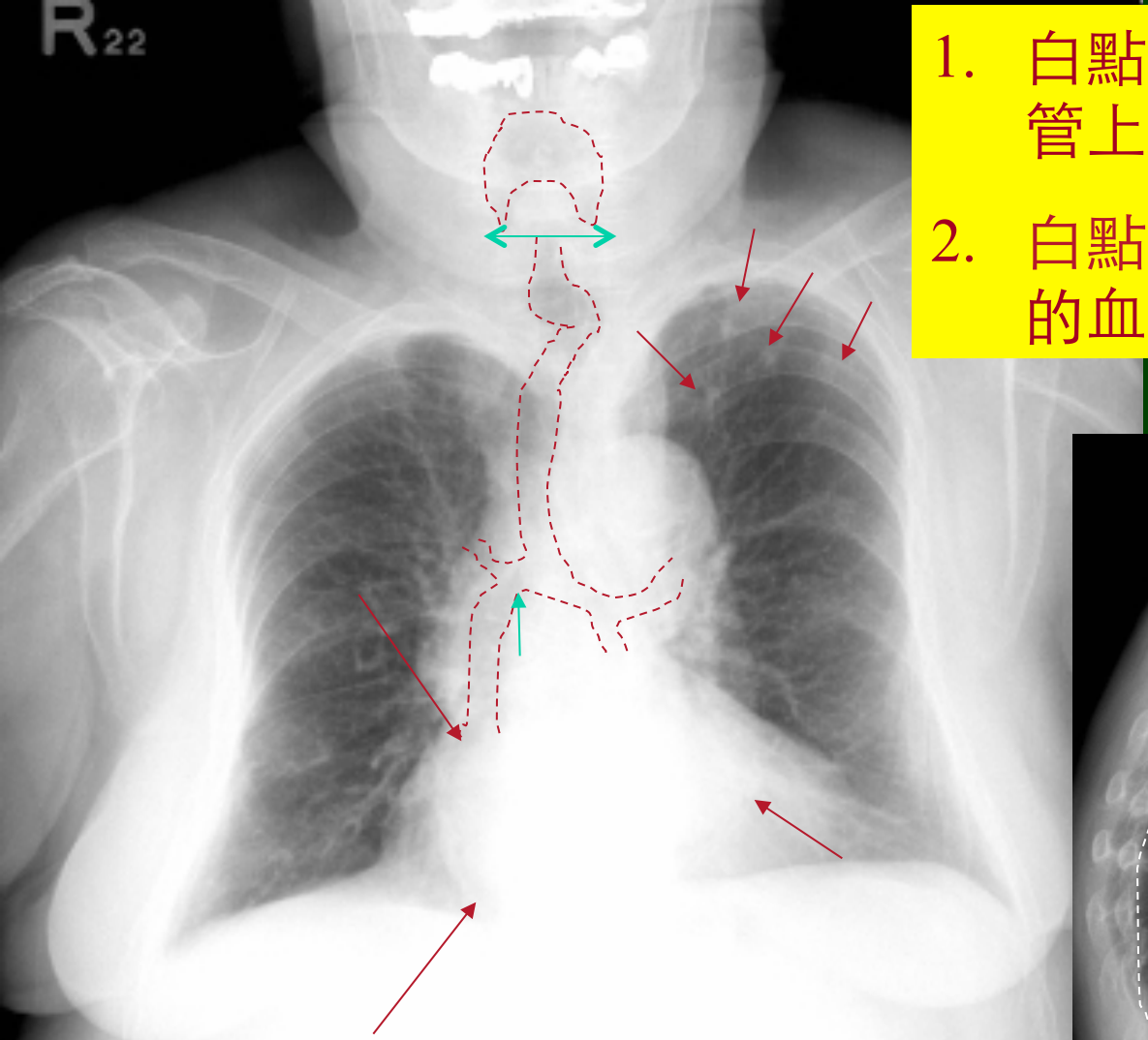


Difficult liberation of ventilator



Hoarseness for 3 wks

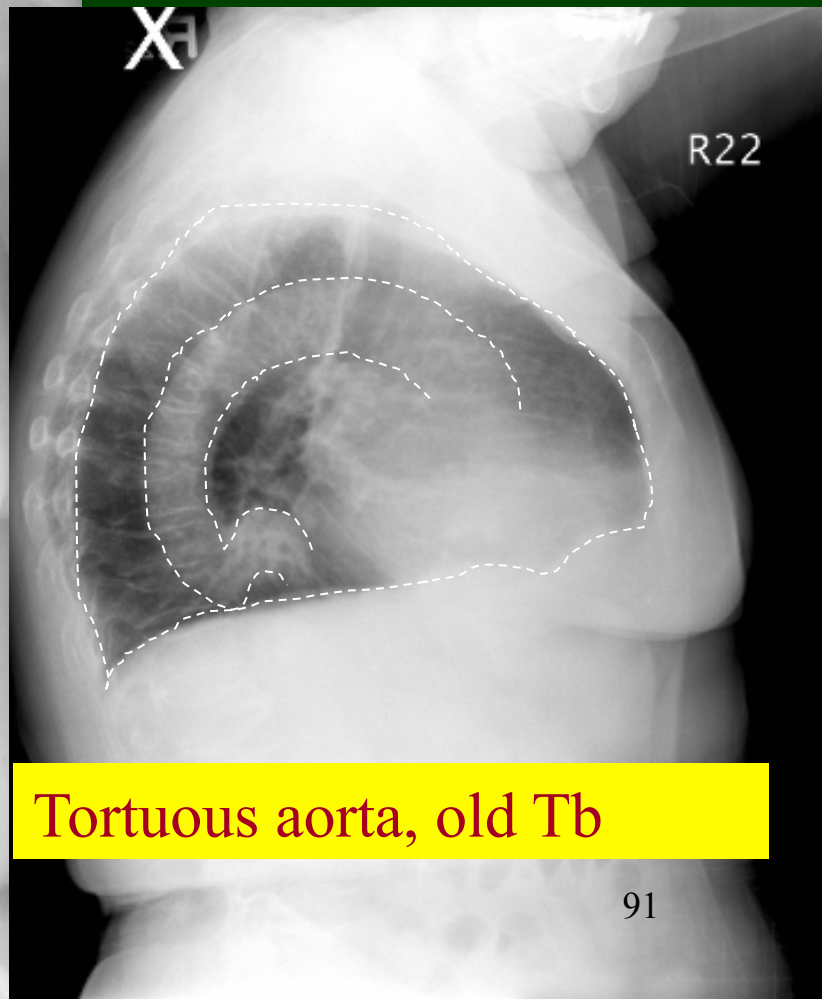
1. 白點不在該有的血管上
2. 白點直徑大於該有的血管



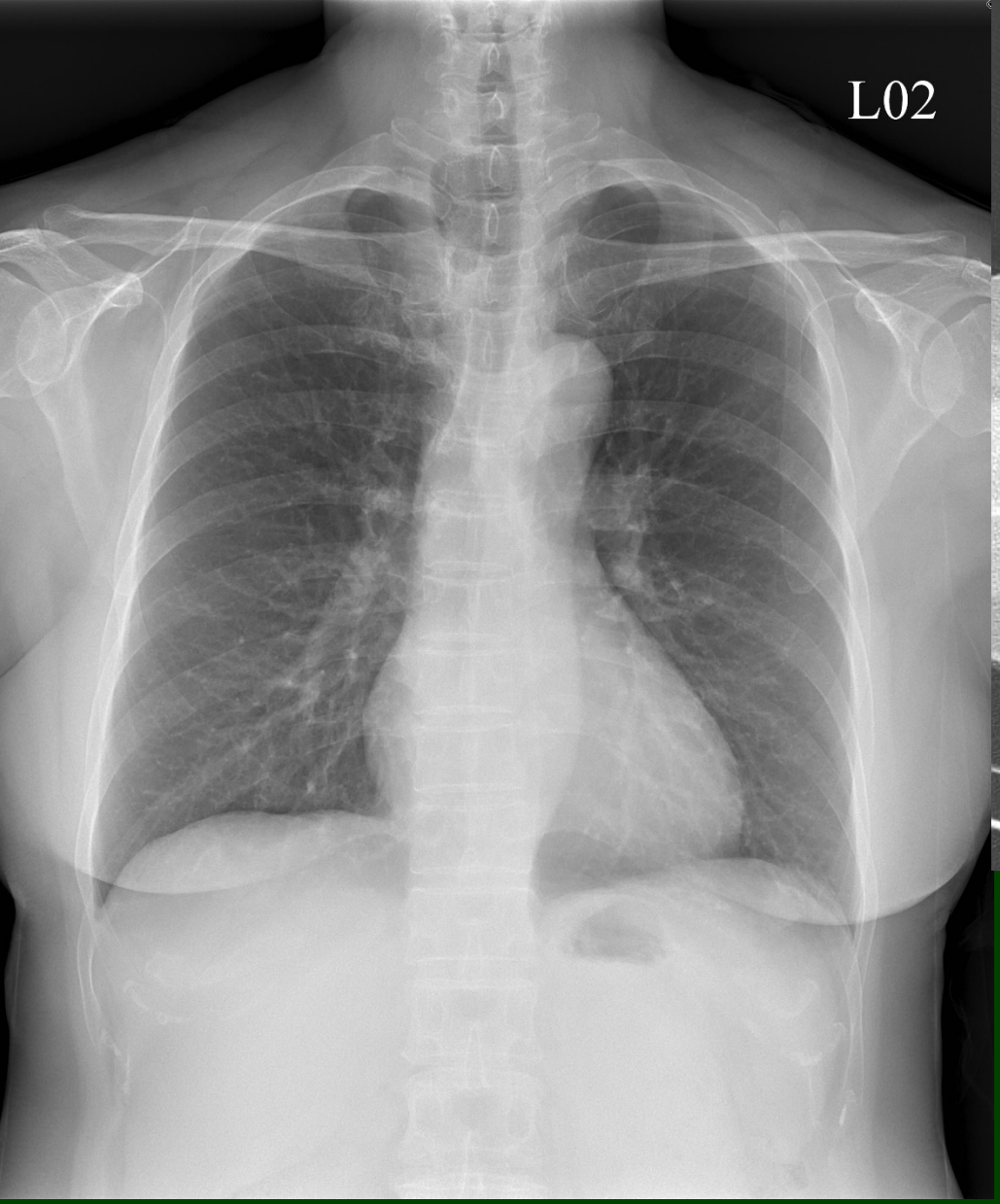
Tortuous Trachea

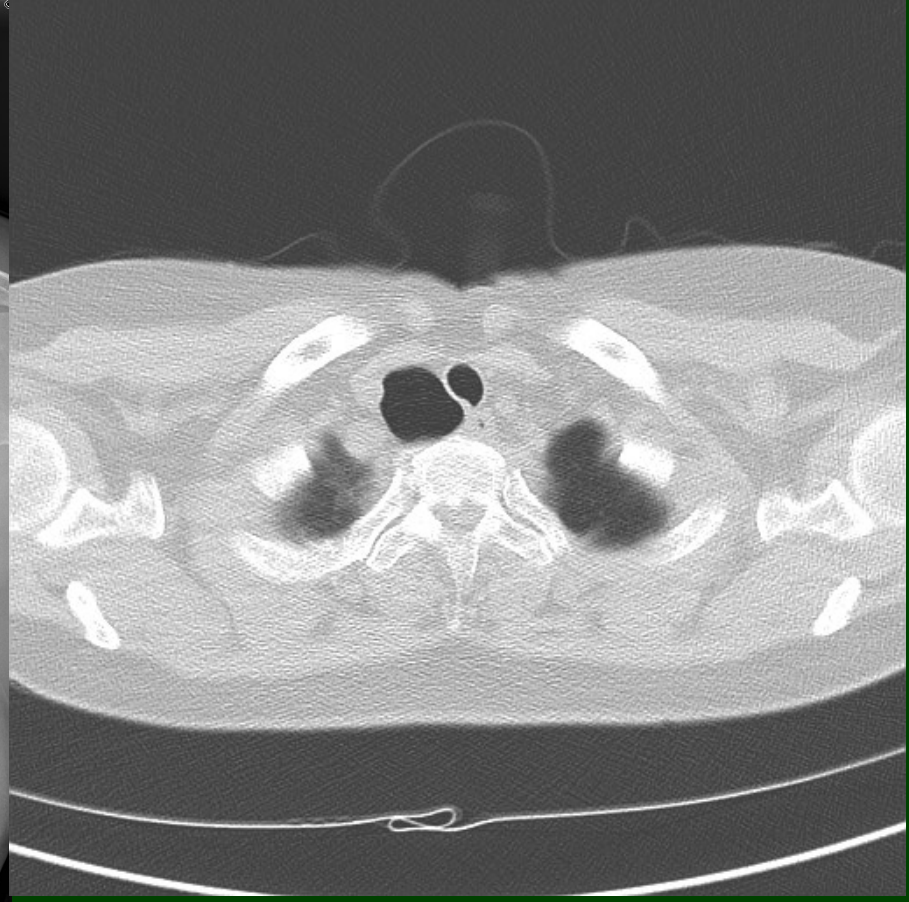
造成tortuous aorta & tortuous trachea的原因?

Kyphosis with shortness of thoracic height



Tortuous aorta, old Tb


L02



Segments

RUL

- S1– apical segment
- S2—posterior
- S3– anterior segment

RML

- S4– lateral segment
- S5—medial segment

LUL (upper division)

- S1+2– apical-posterior segment
- S3– anterior segment

LUL (lower division)

- S4– superior
- S5-- inferior

Segments

RLL

- S6–- superior segment
- S7—medial basal
- S8—anterior basal
- S9—lateral basal
- S10—posterior basal

LLL

S6–- superior segment

S8—anterior basal

S9—lateral basal

S10—posterior basal

18個肺節
及分布於肺節內的氣管、動脈命名

- 肺節　—S1,2,3,….S10 (left or right side)
- 支氣管—B1,2,3…..B10 (left or right side)
- 肺動脈—A1,2,3,….A10 (left or right side)

呼吸道”透視”的重要性

- “診斷”呼吸道病變 (氣管側線)
- 輔助判斷氣管內管、鼻胃管等”插管”的適當性與正確性(氣管側線)
- 輔助”肺動脈、肺紋之判讀定位”
- 診斷氣道阻塞性肺葉塌陷 (obstructive atelectasis) (縱向八線、橫向四線消長)

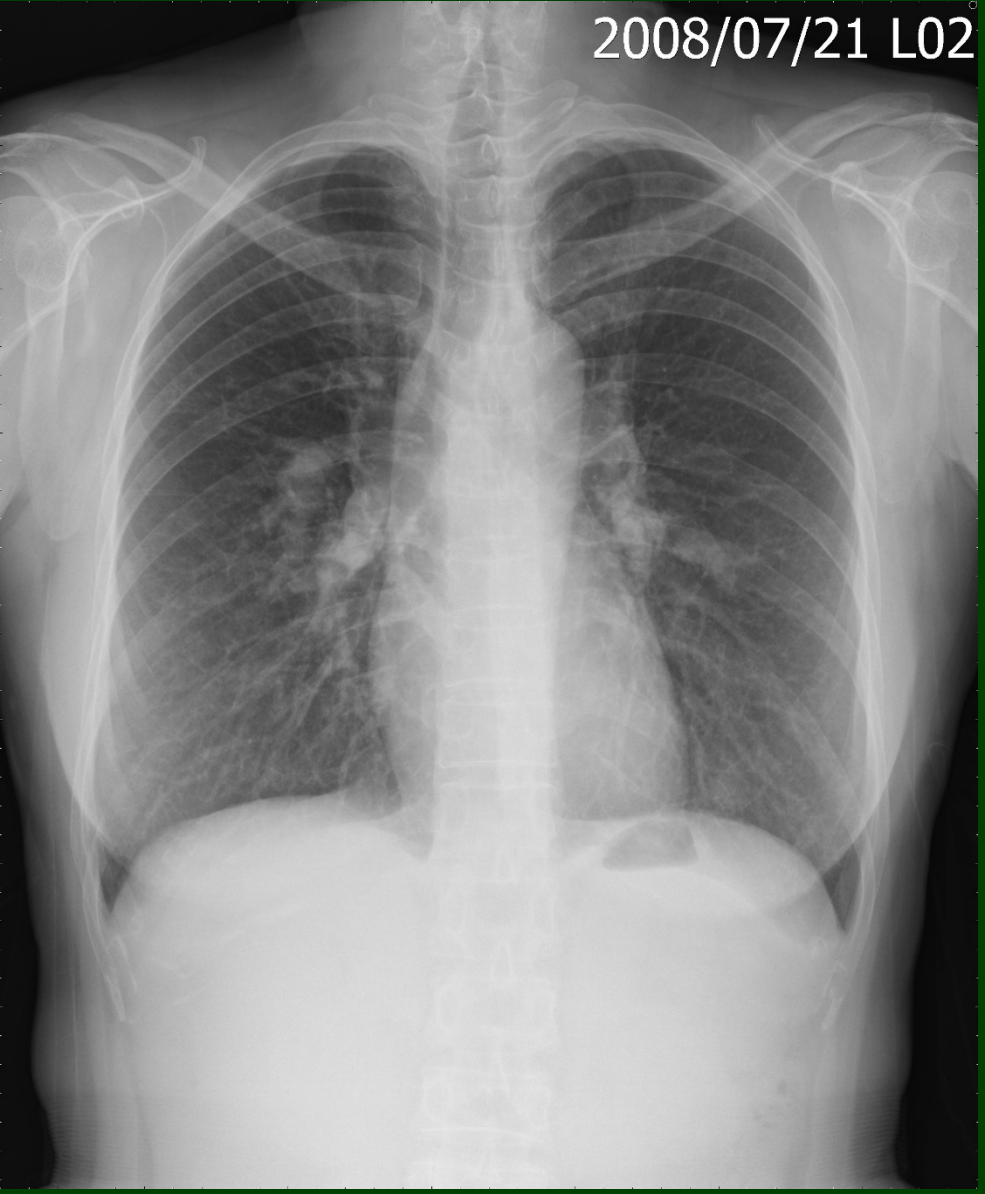
肺葉塌陷分型

(拉力) 1. 氣道阻塞性肺葉塌陷 (obstructive atelectasis)

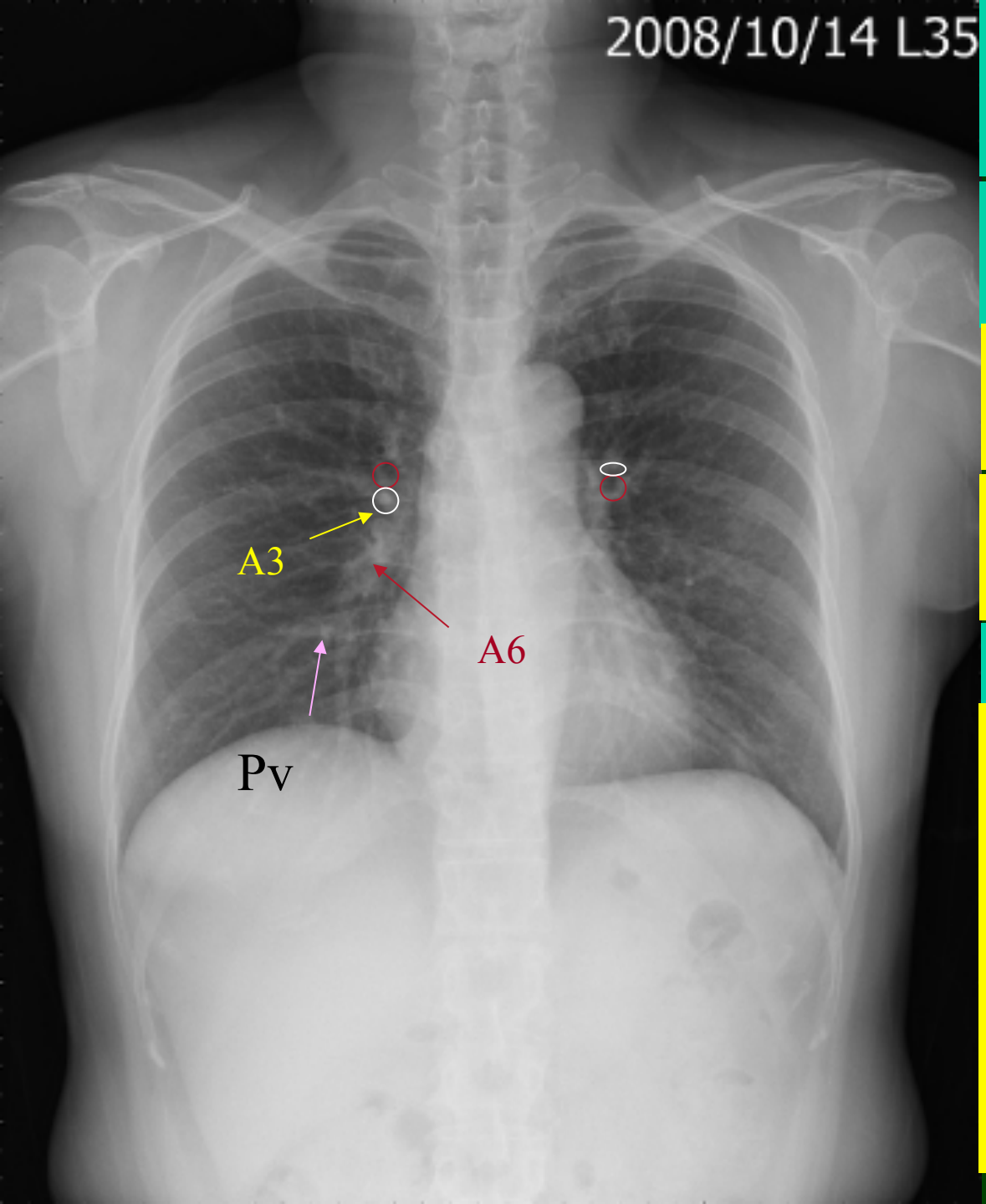
(拉力) 2. 纖維化肺葉塌陷 (fibrotic atelectasis)

3. 肺外壓迫性肺葉塌陷 (passive

(推力) atelectasis)



Wheezing, serum IgE>5000,
Eosinophil>38%



Lung fields 中的『小白點』與『小黑洞』

這張有多少個『小白點』與『小黑洞』？

A3:anterior segmental arteries (upper lobe)

B3: anterior segmental bronchi (upper lobe)

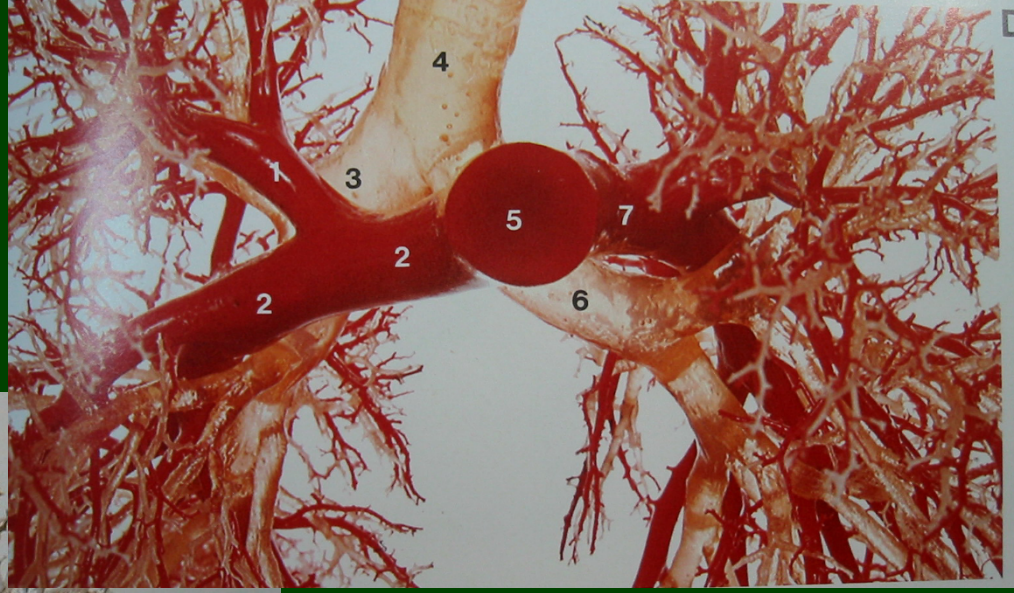
橫看成嶺側成峰

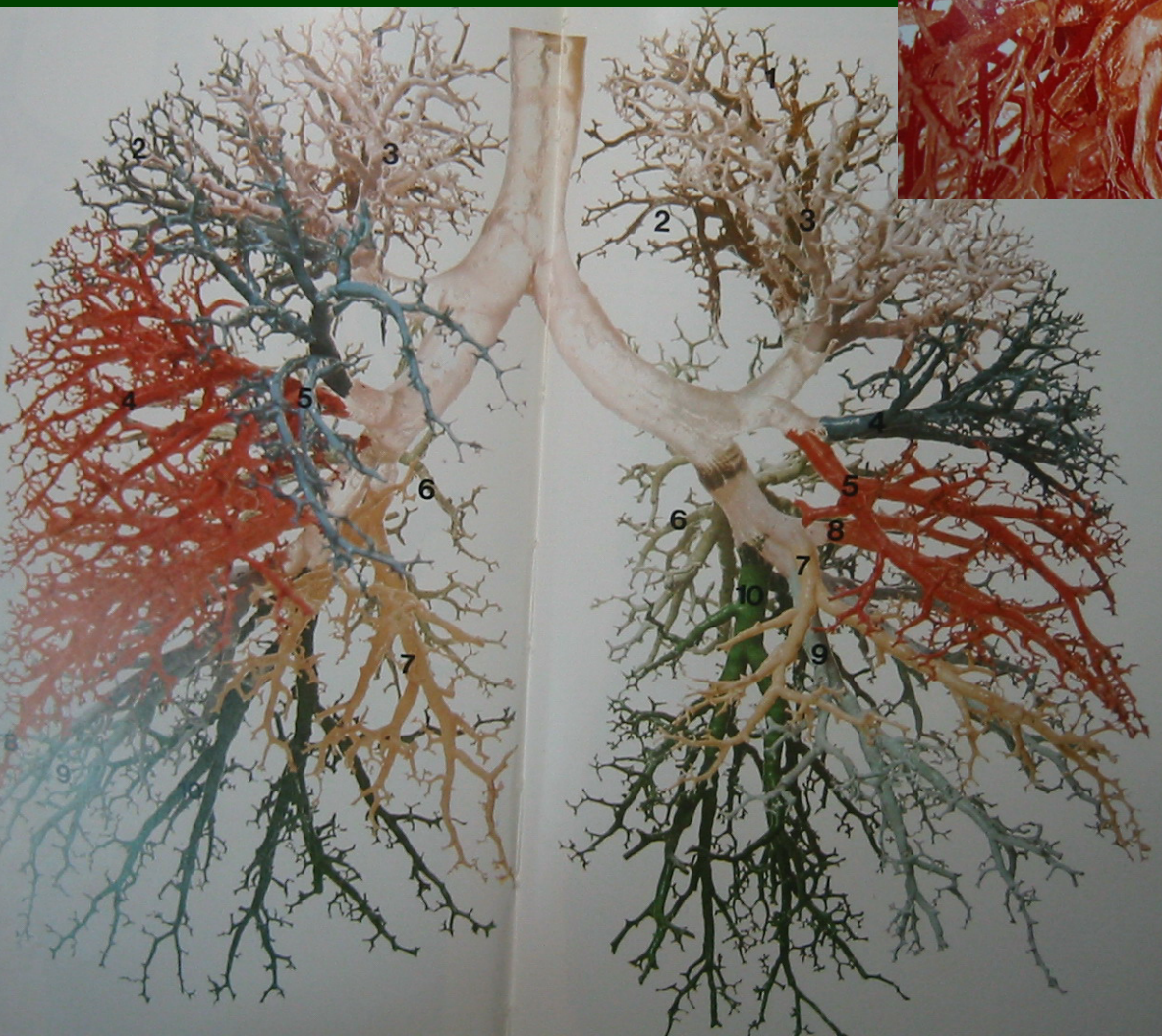
判讀重點：

1. 黑洞是否在原有的支氣管氣道上，且直徑合理
2. 白點是否在原有的肺血管上，且直徑合理

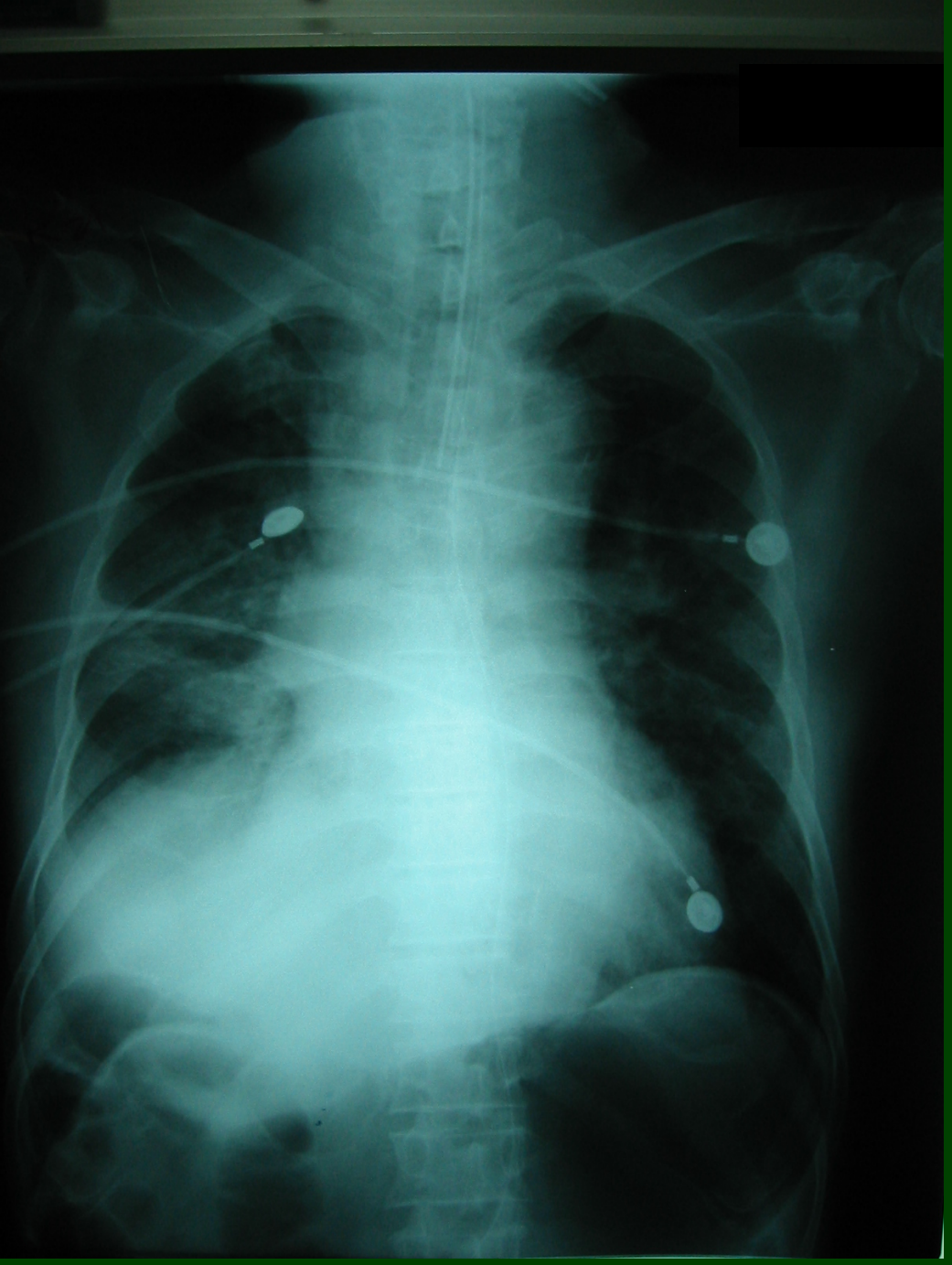
『小白點』

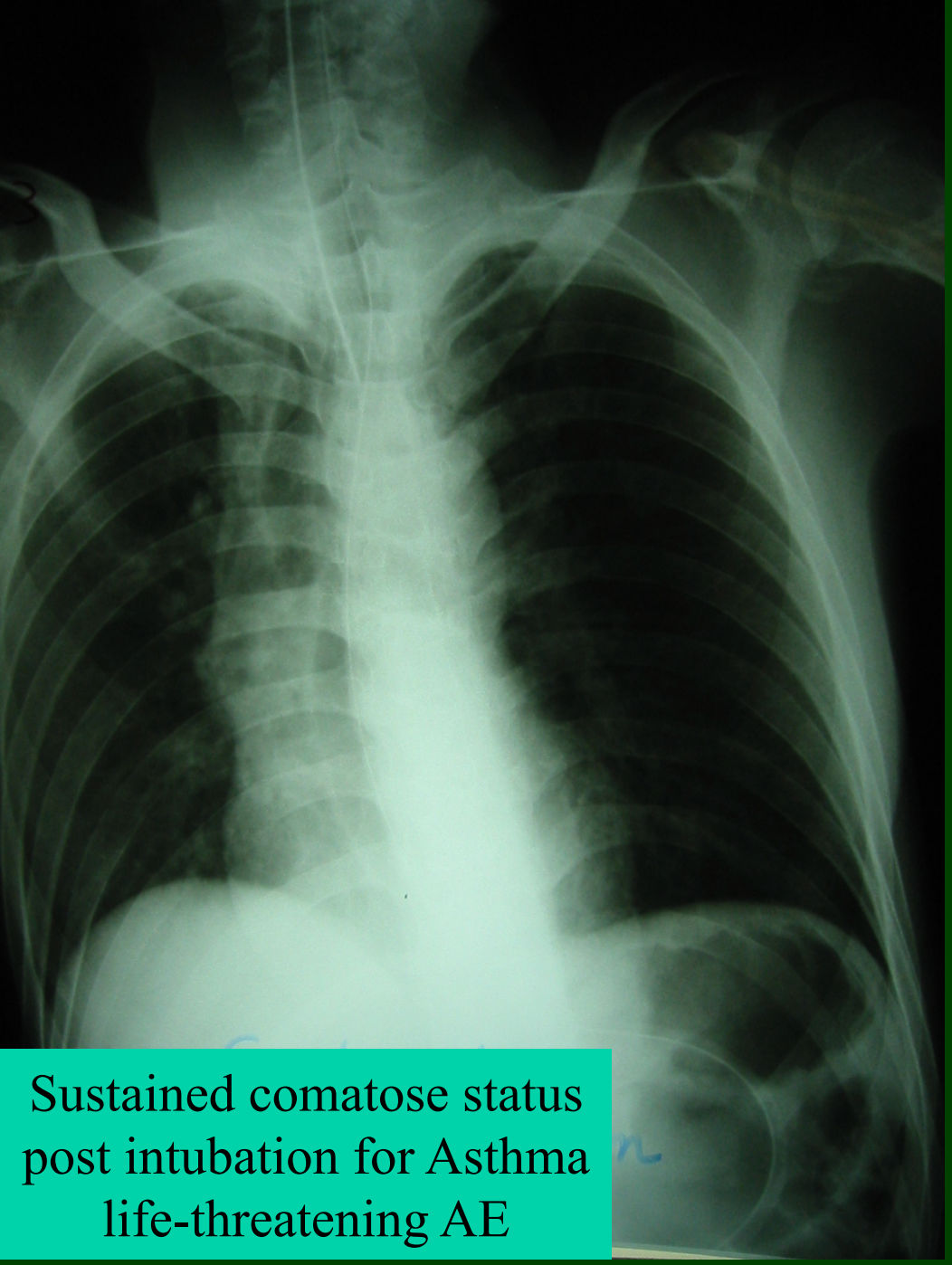
『小黑洞』



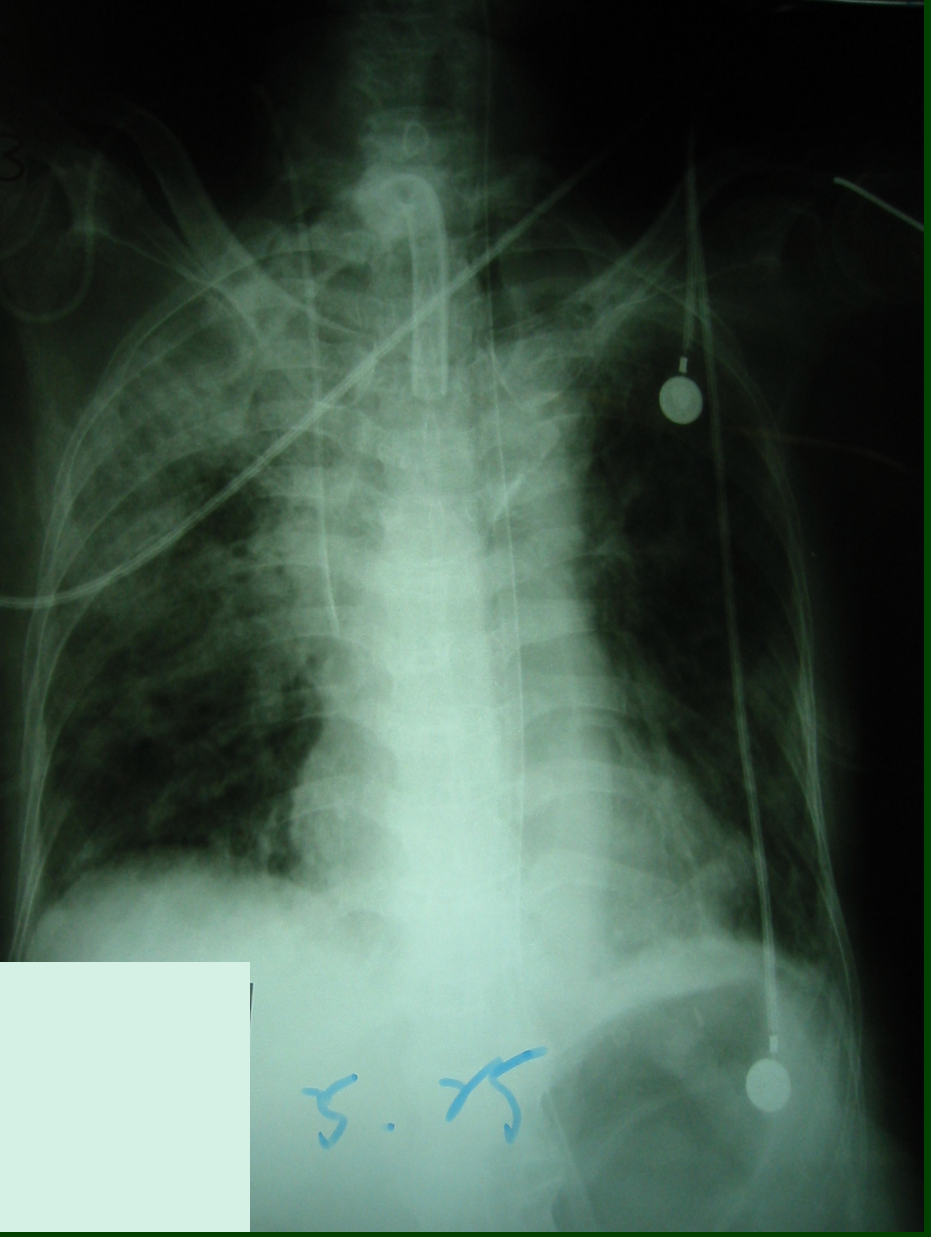


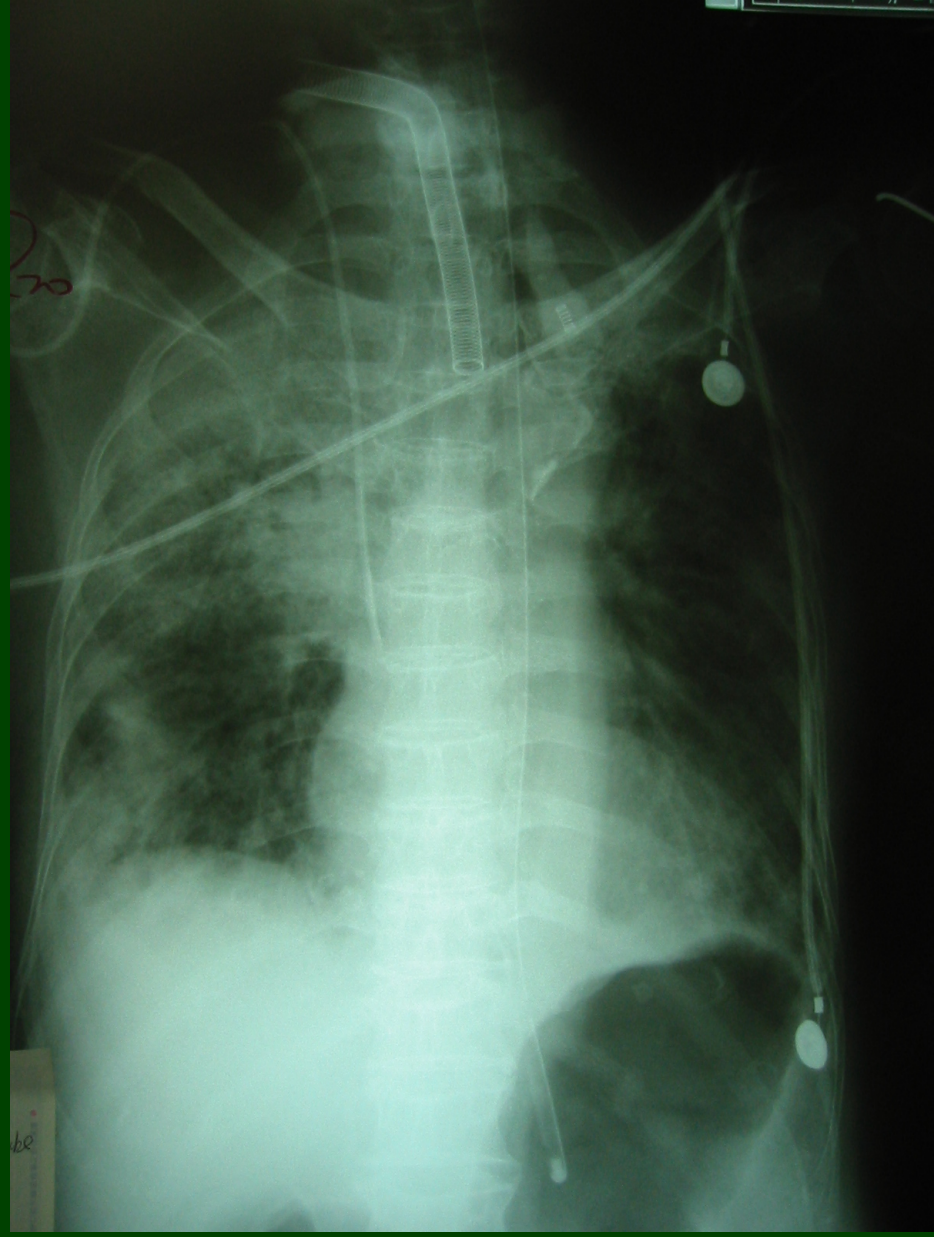
重點在是否與原有的肺紋路或支氣管氣道拼湊成「樹狀圖」，連成一體且直徑合理。當然腦中要先有樹狀分枝圖譜

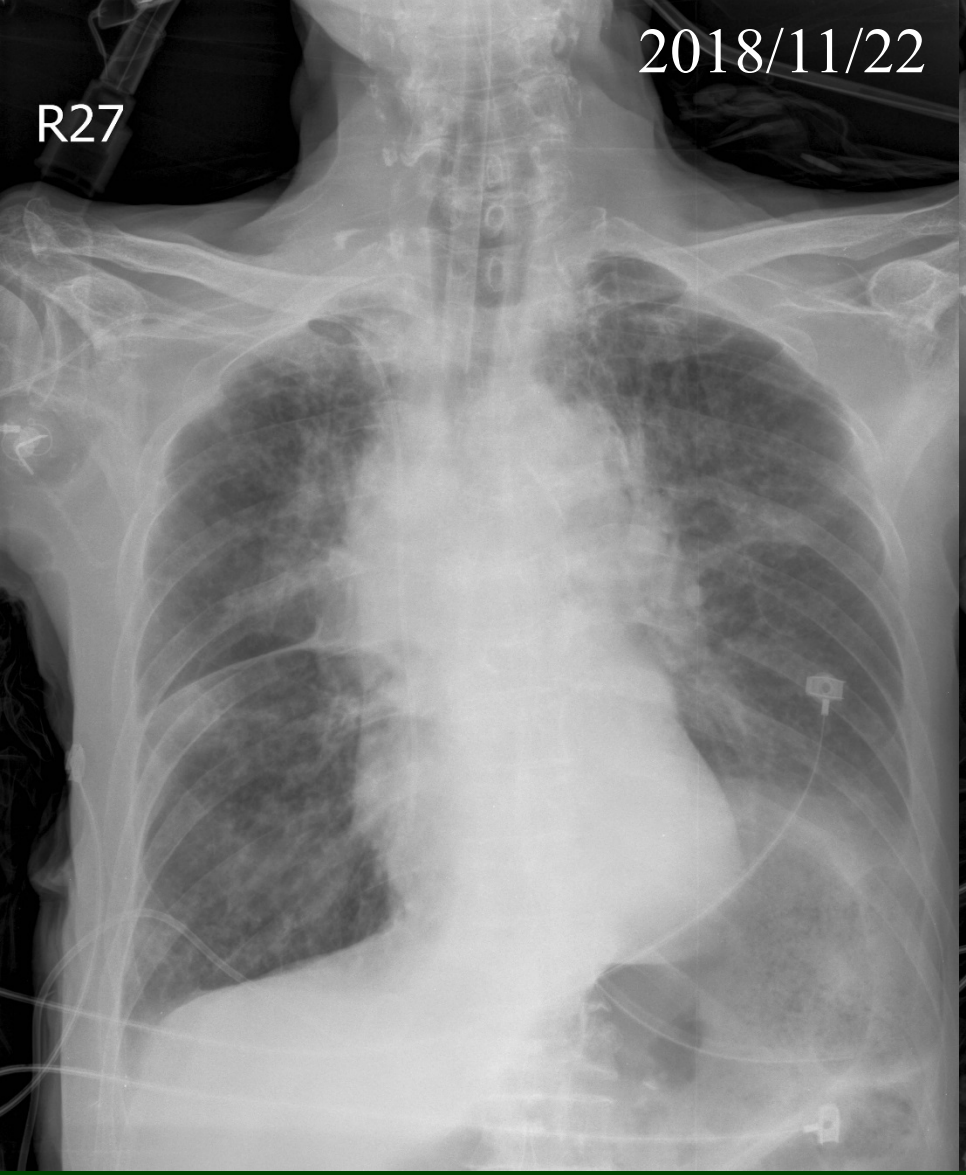


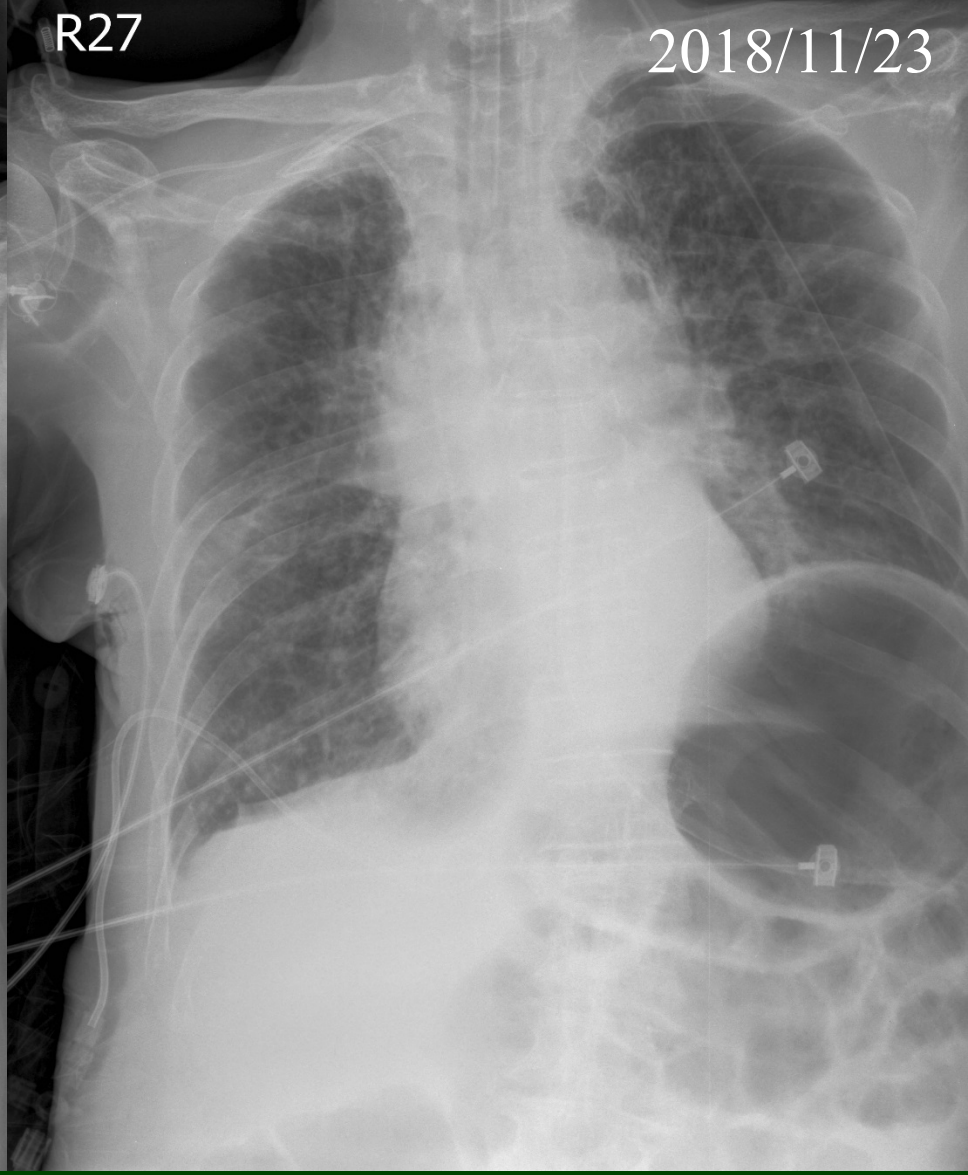


Sustained comatose status post intubation for Asthma life-threatening AE



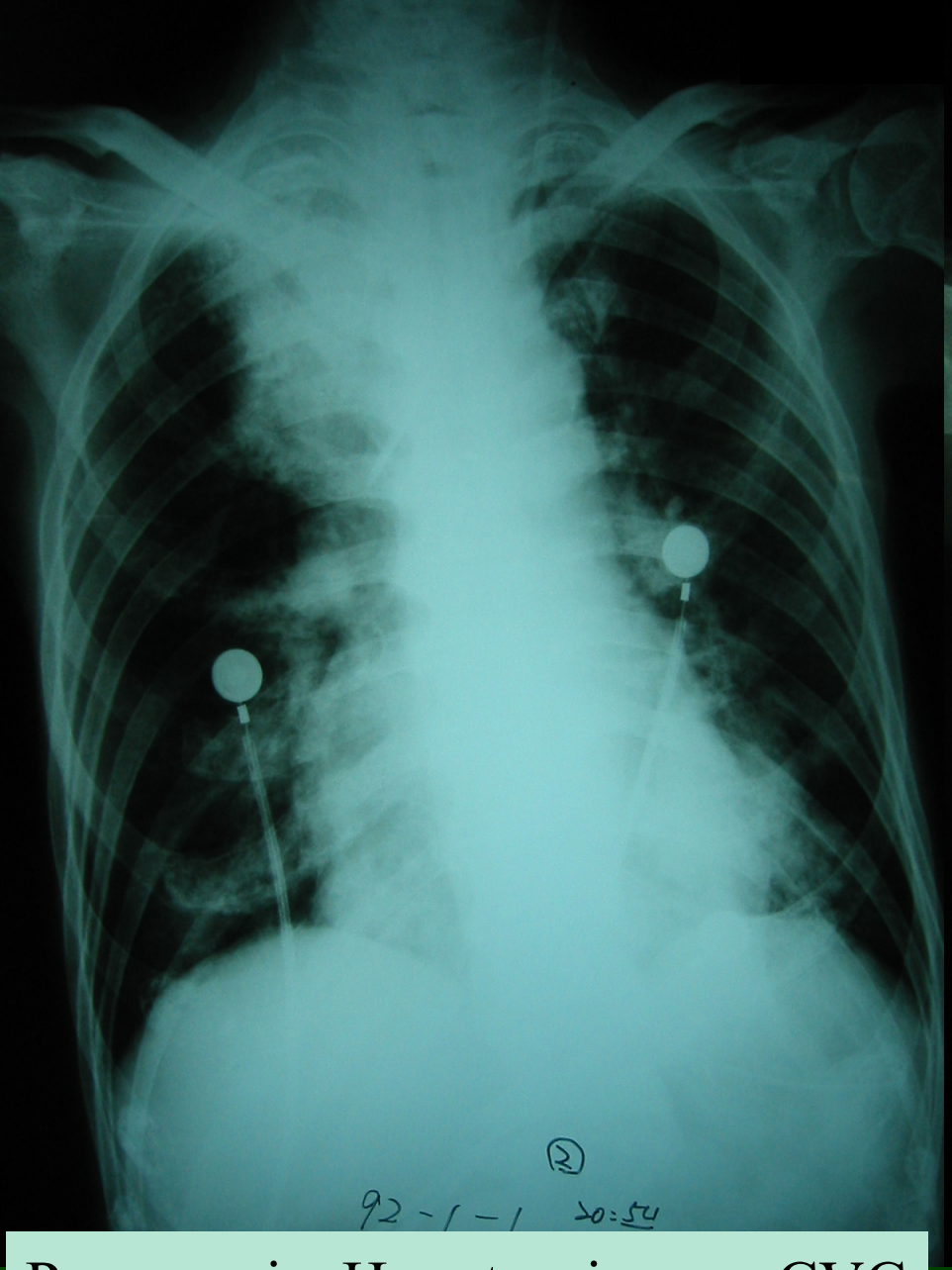




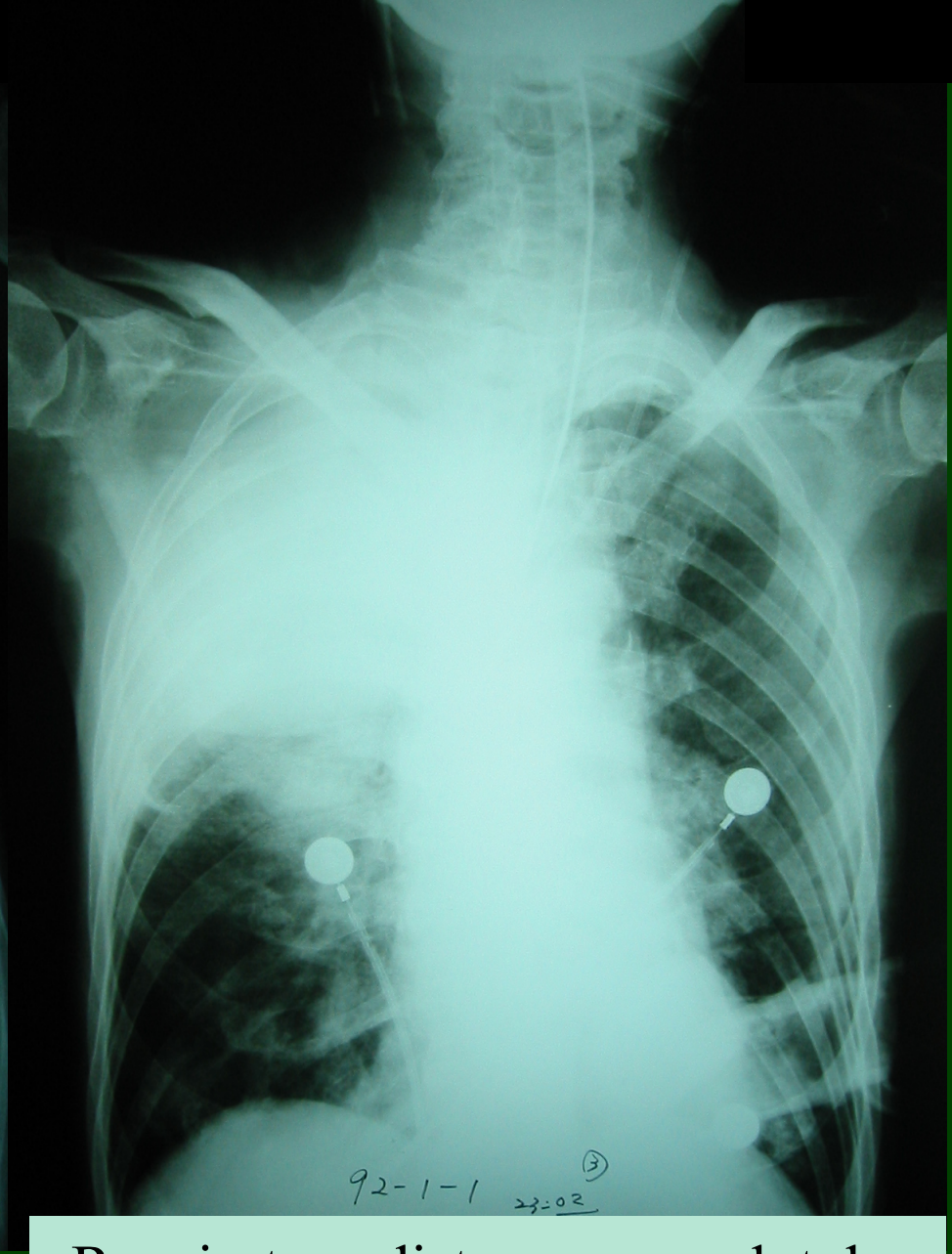


22:03 asphyxia, s/p ETT intubation

02:00 ABG: pH=7.06; PaCO2=133



Pneumonia, Hypotension, on CVC



Respiratory distress, on endotube

ETT誤插食道內
ETT esophageal intubation
的X-ray Triad

1. ETT部分或全部不在trachea氣柱內
2. NG周邊的食道內充滿空氣
3. 胃、腸內脹氣

(病人具任一項就須懷疑是否食道內插管)

臨床上看到何種signs必須要懷疑ETT誤插食道內esophageal intubation

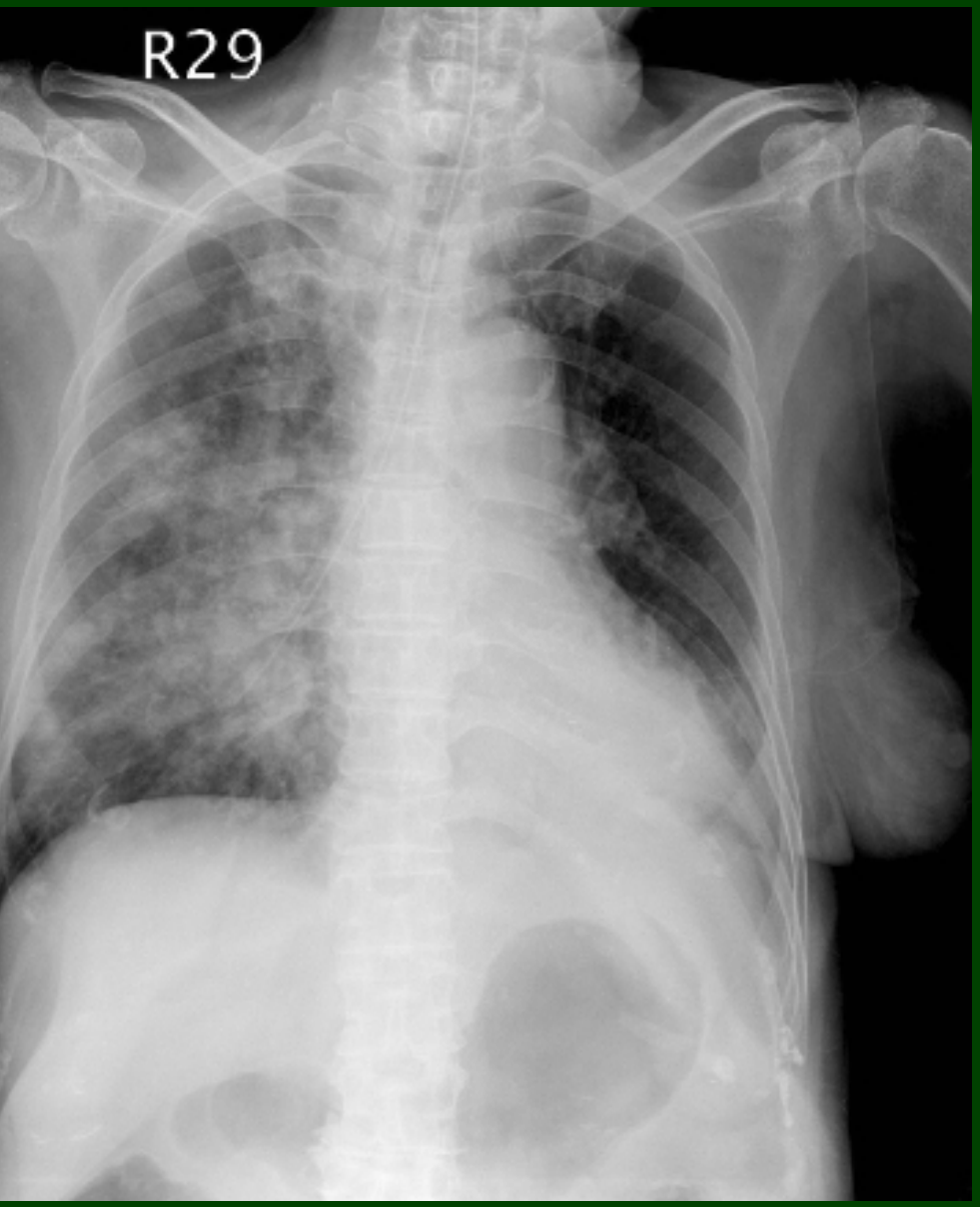
1. 腹脹
2. NG decompression bag air-trapping
3. 口鼻漏氣、或喉部氣流聲、呻吟聲、甚至講話
4. 呼吸器volume control但Tidal Volume打不起來
5. Patient/ventilator ventilation dissociation病人與呼吸器各自獨立呼吸。

ETT誤插食道內 Esophageal Intubation的臨床意義

1. 如未能及時發現，可能立即致命
2. 若延遲發現，而病人呼吸狀況OK，則必須仔細評估是否真的須要重新插管。

TE fistula的判讀要素

1. ETT仍在Trachea內，餘同esophageal intubation
2. 食道內充滿空氣〔即NG周邊多一圈空氣〕
3. 胃或胃腸充滿空氣
4. Air trapped in the drained NG bag



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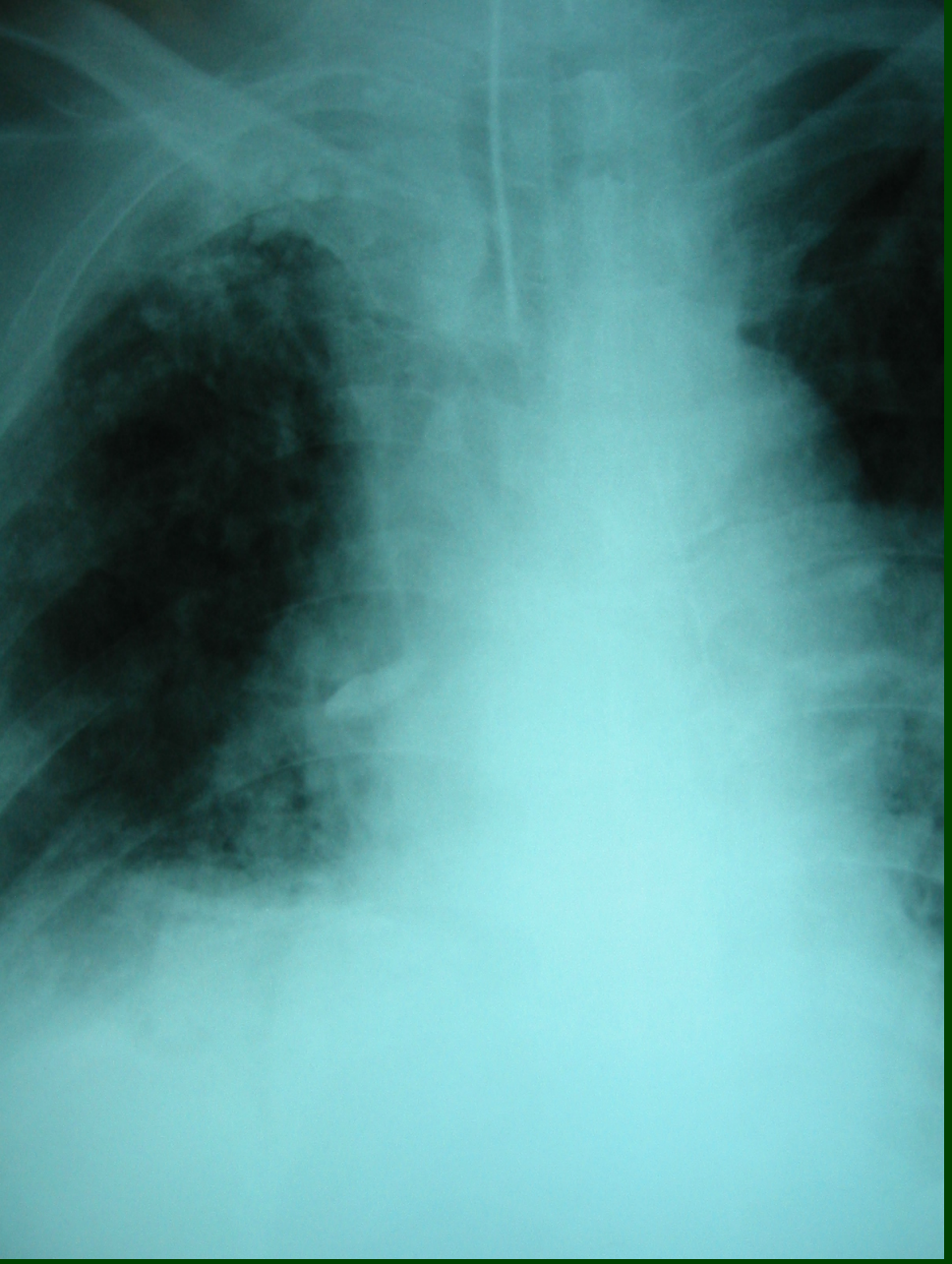

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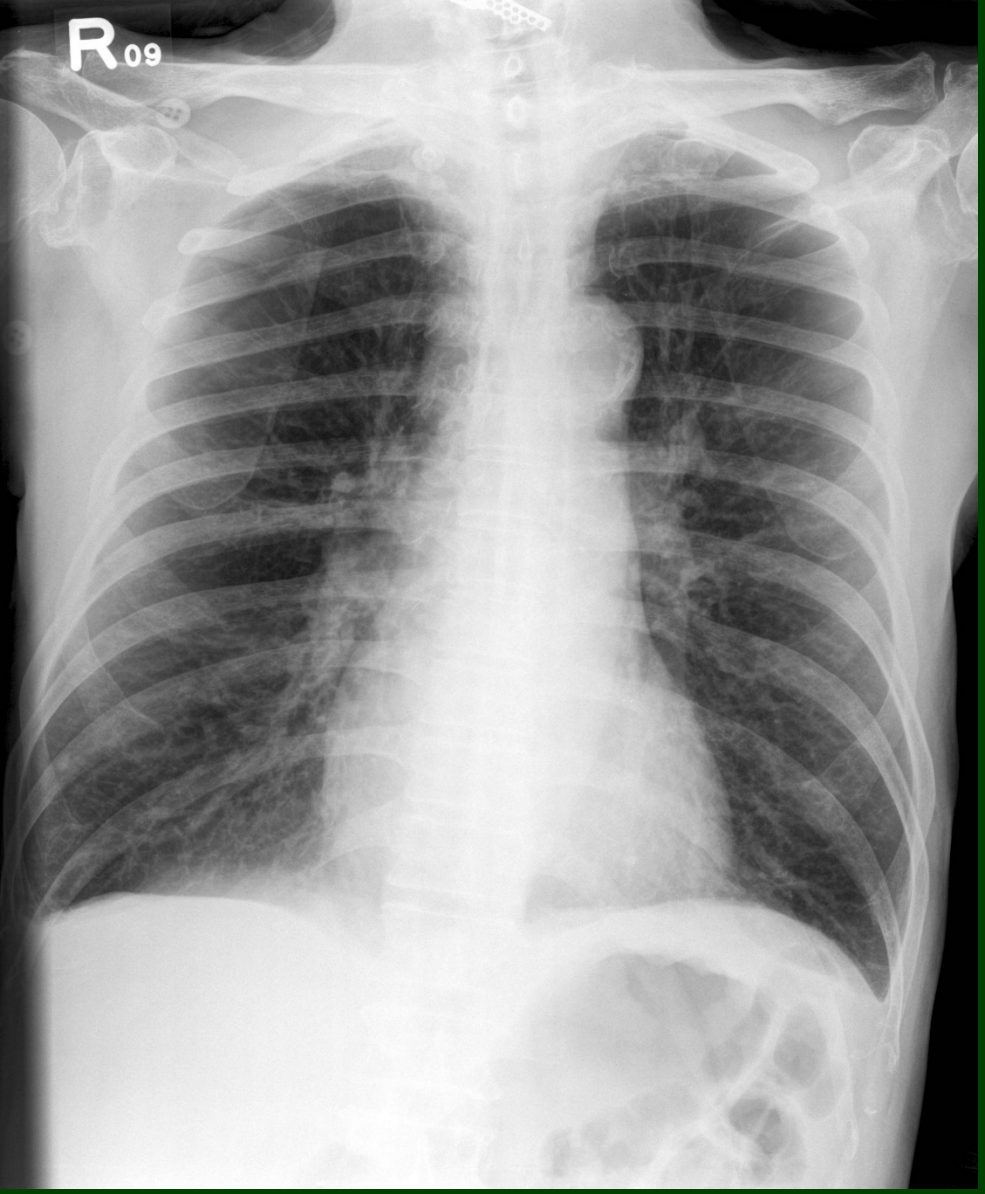

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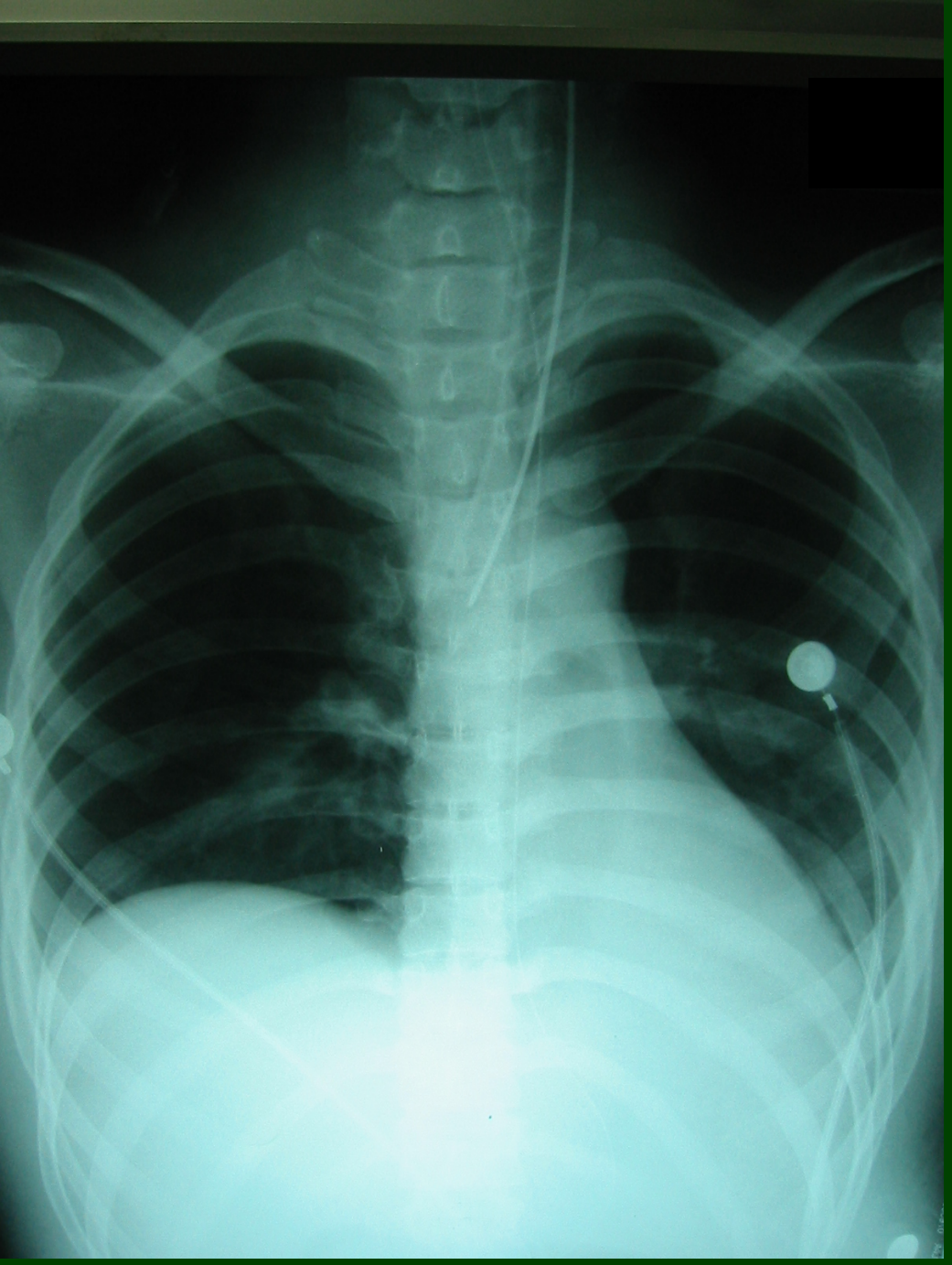

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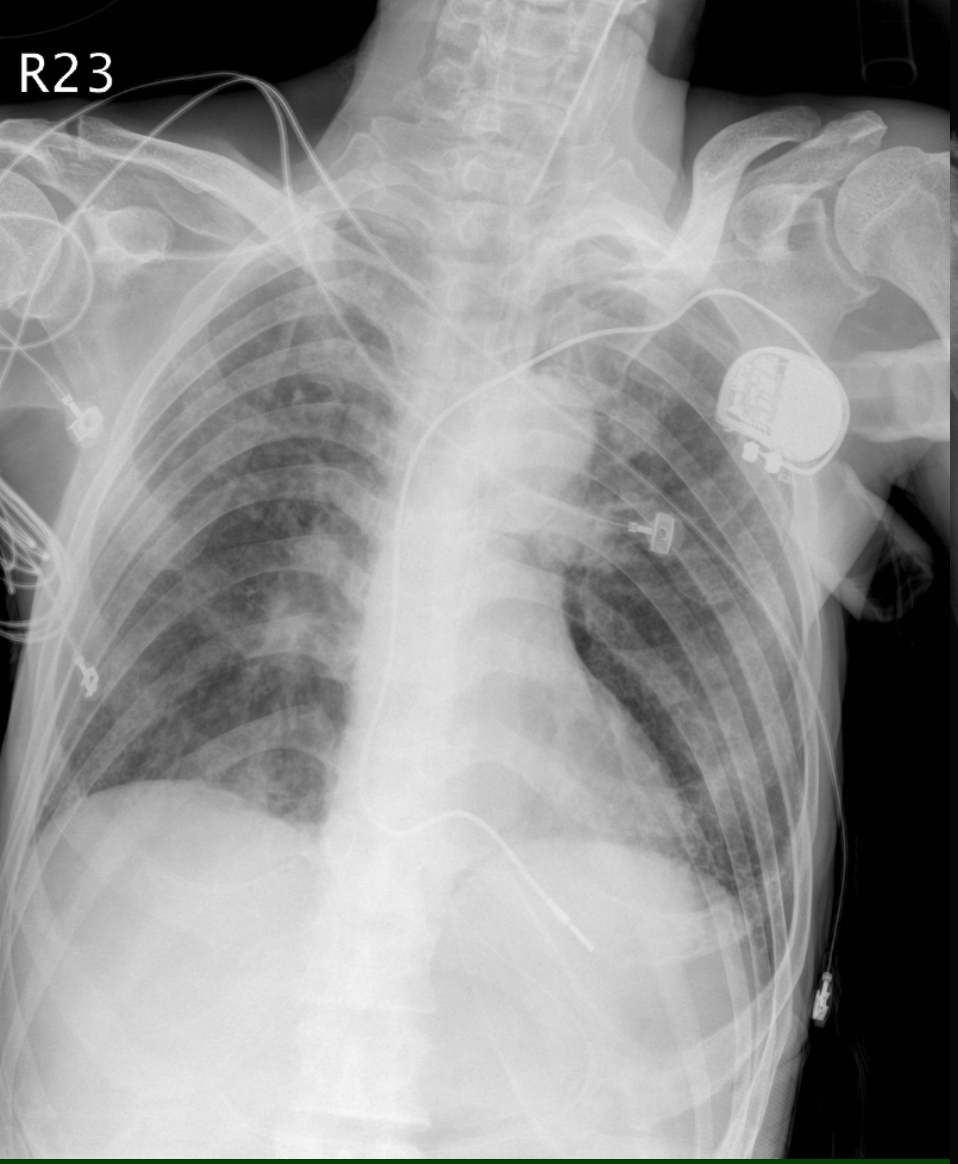
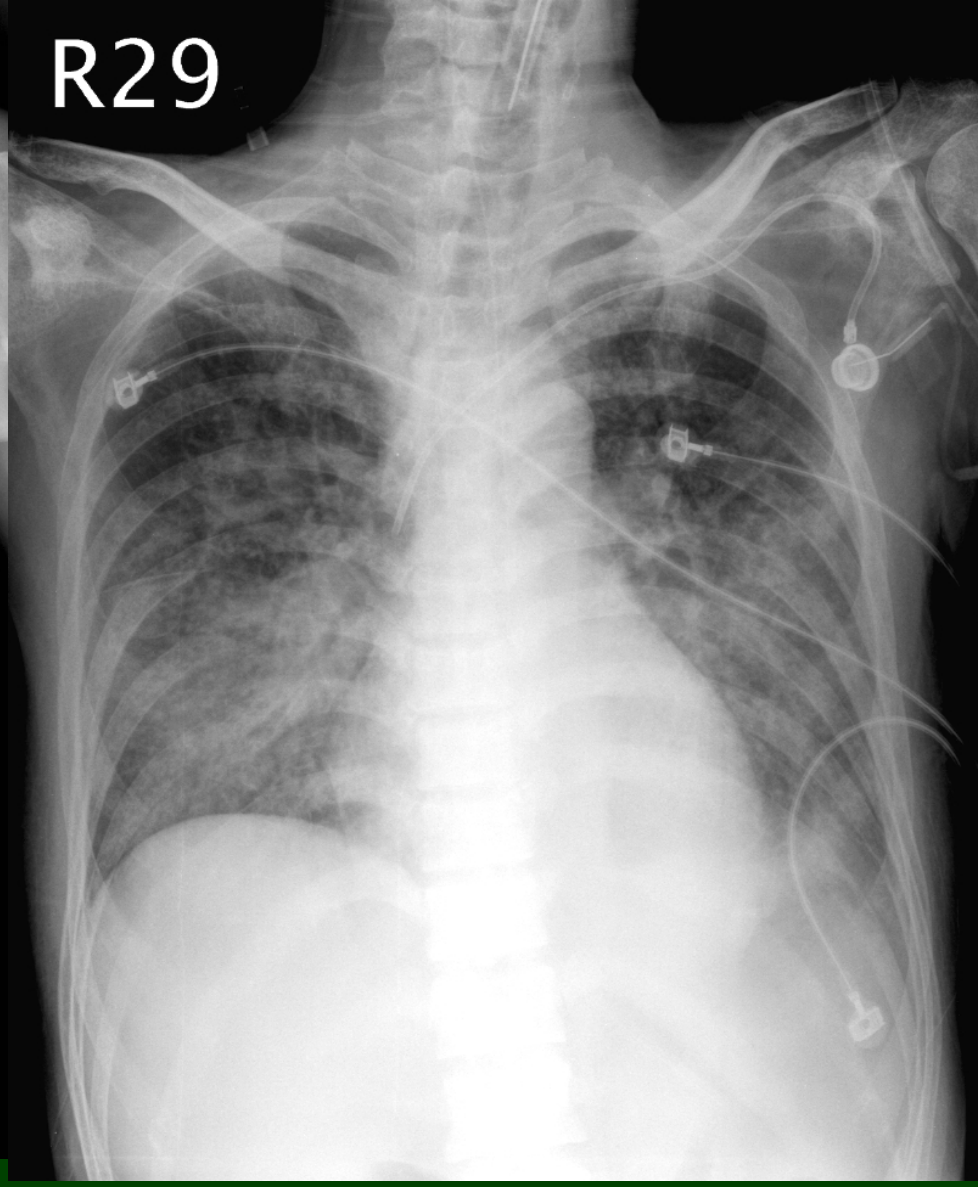
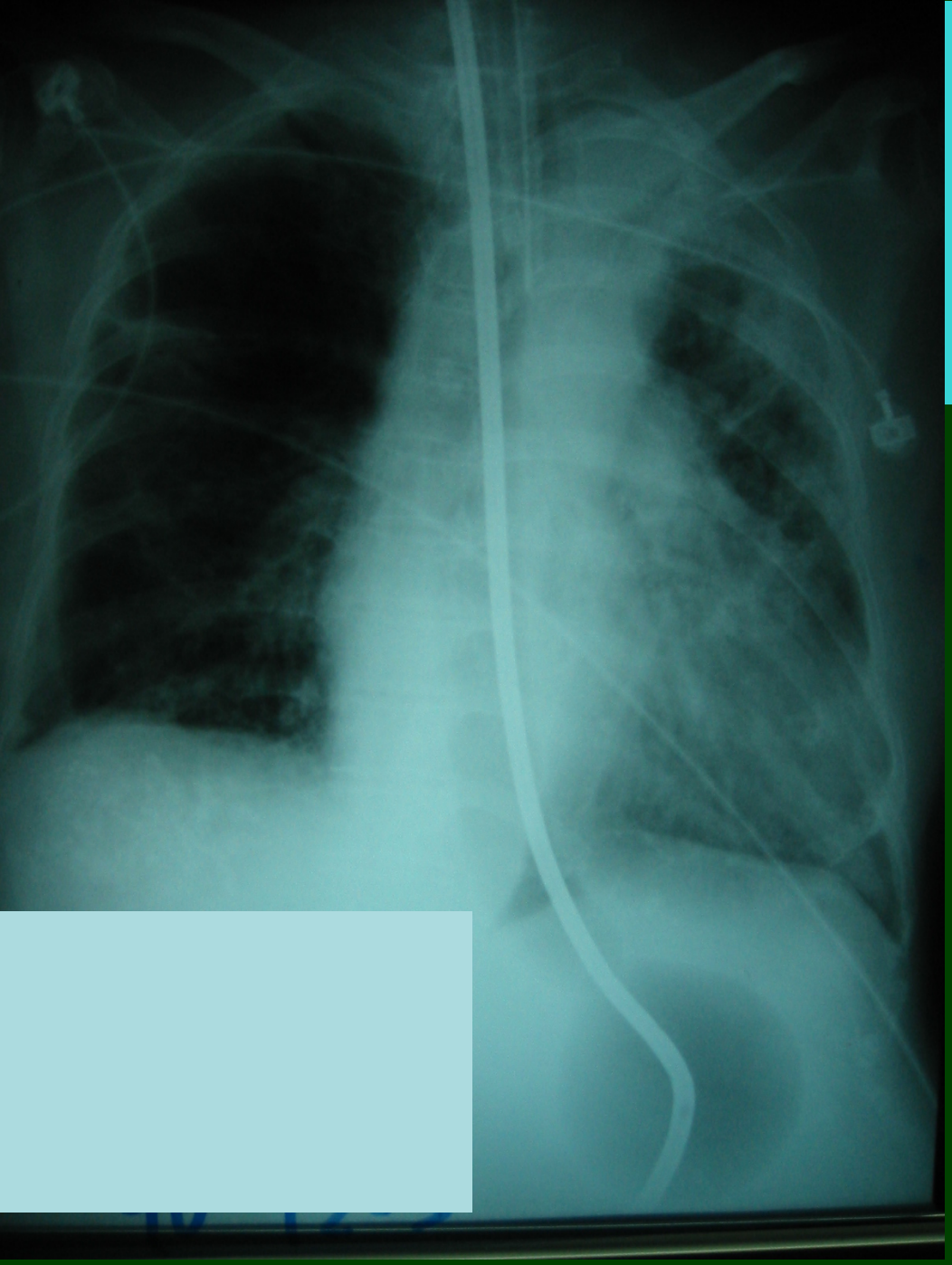
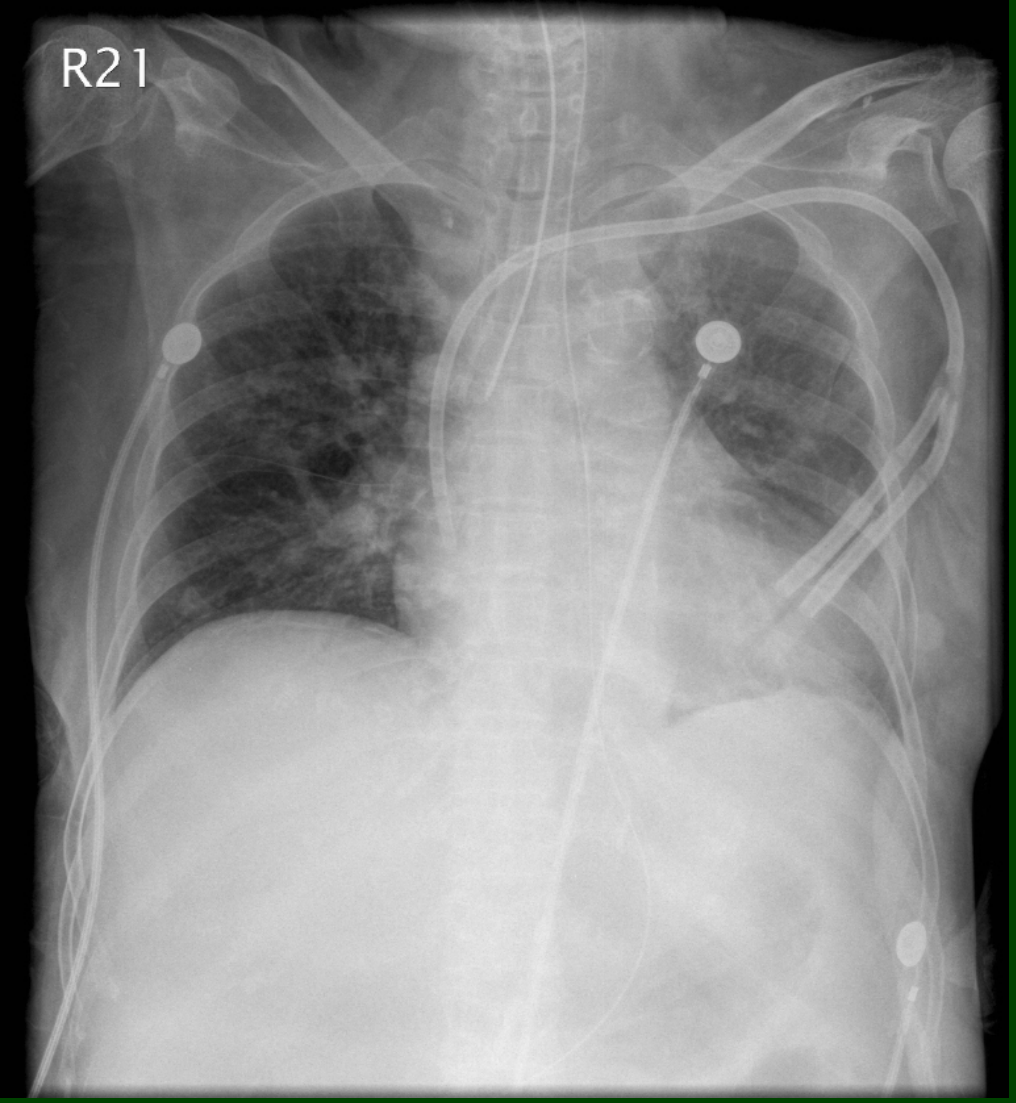
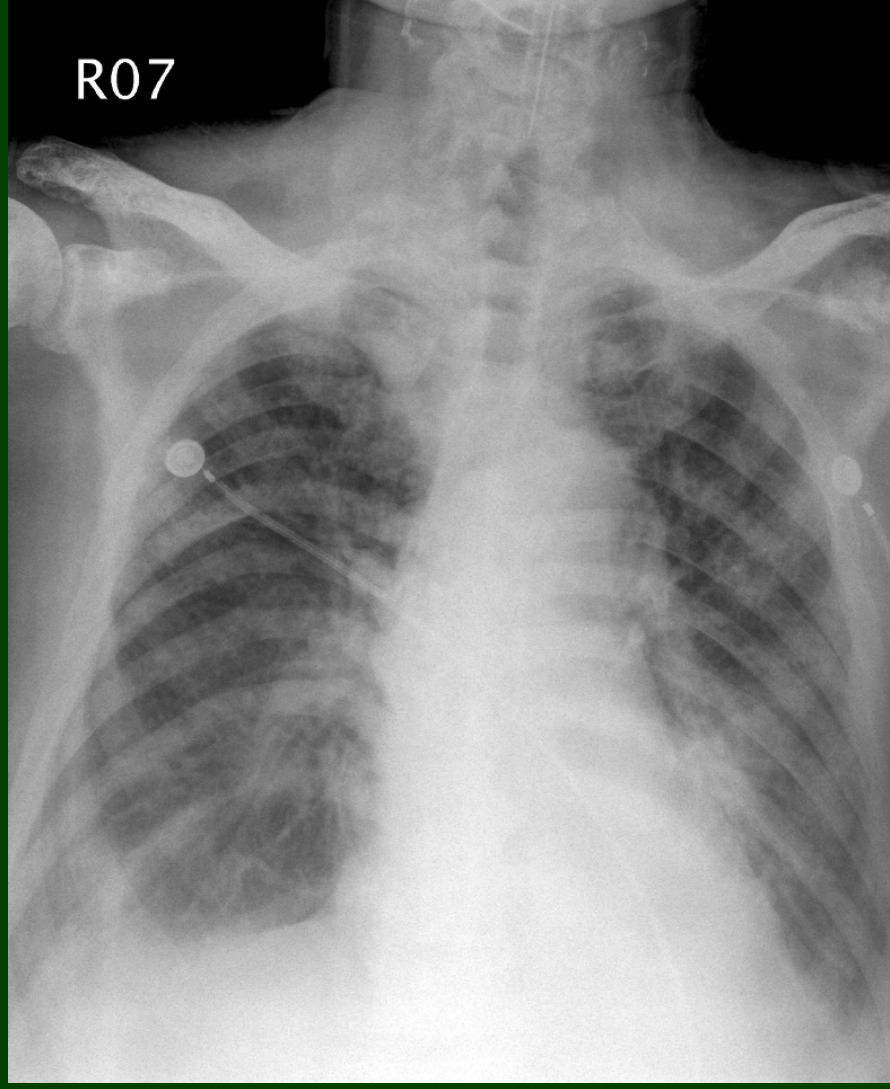

R23


R29



- Cirrhosis of liver with EV bleeding
- Wheezing dyspnea, but without hx of bronchial asthma


R21


R07

插管併發症─ETT or Trach 篇

1. 誤插入食道內 Esophageal Intubation
2. 支氣管內插管 Bronchial Intubation
3. 插管太淺Inadequate depth – adjacent larynx
4. 咽腔插管Nasopharyngeal Intubation
5. TE fistula
6. Trachea perforation
7. 人工氣道下游被cuff堵住〔多因Poor alignment between ETT/Trach and trachea〕
8. Cuff herniation
9. Foreign body aspiration during intubation, eg. Teeth

各種「不適當的固定」可能造成的傷害

- 固定太淺：
  1. UE : witness or unwitting
  2. loss of airway
  3. larynx injury
  4. Aspiration syndrome
- 固定太鬆：
  1. UE: witness or unwitting
  2. loss of airway
  3. air-leak (low TV/pressure)
  4. aspiration pneumonia
- 固定太深：
  1. barotrauma
  2. obstructive pneumonia
  3. Shunting hypoxemia
- 固定太緊：
  1. Trachea injury (trachea stenosis; granuloma; tracheo-malacia

1. 固定太淺、或太鬆：容易於運送時發生UE (目睹、或未能察覺的UE〕
2. 固定太深、或太緊：容易產生其他傷害。

謝謝聆聽
敬請指教