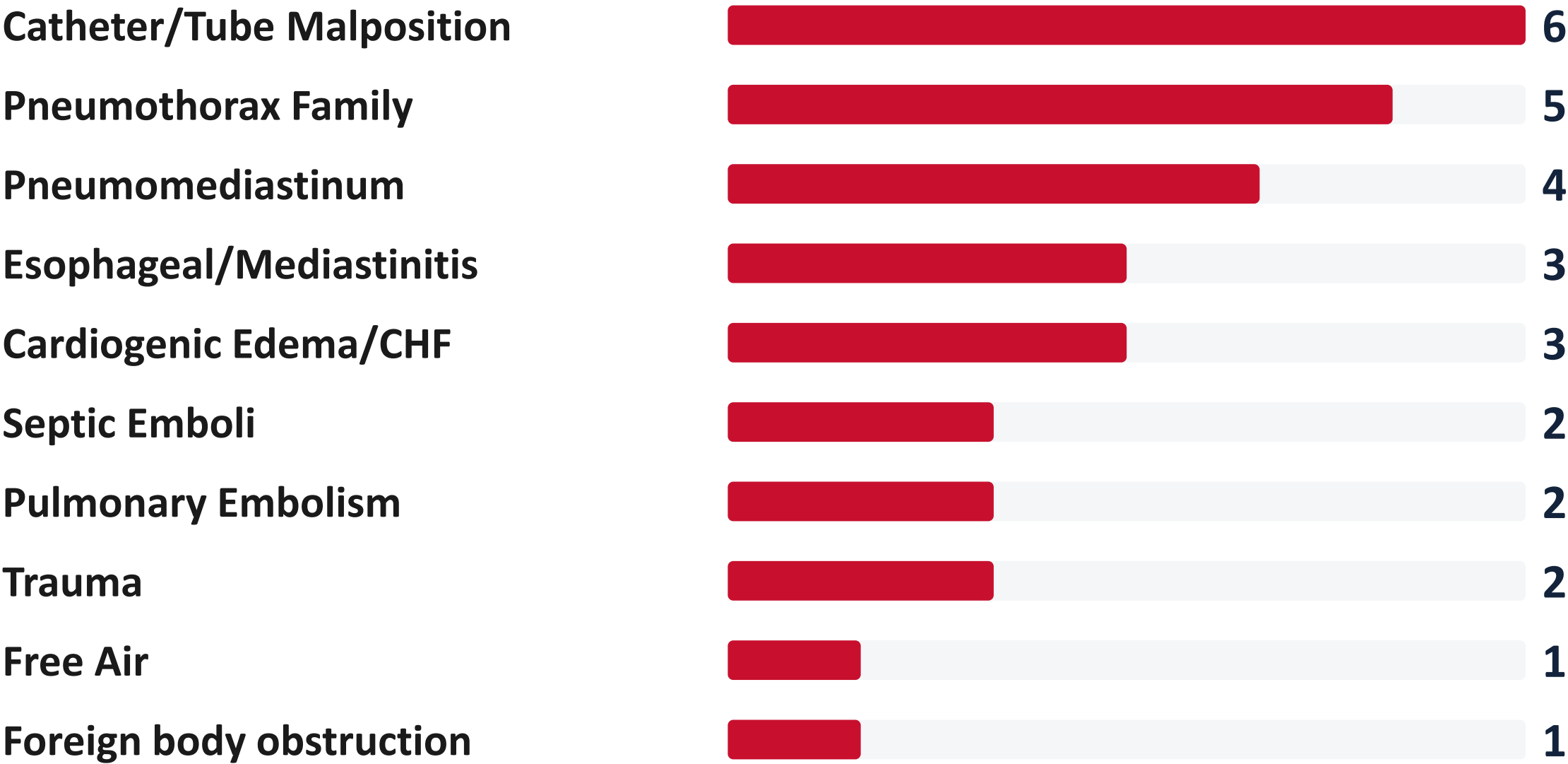


115 年影像判讀繼續教育課程 急重症影像判讀

淡水馬偕 胸腔內科
鍾心珮 醫師

Frequency by Category (2021-2025)

五年重症影像考題分類頻率



Lines, Tubes and Catheters

Table 13.1 Optimum positions.

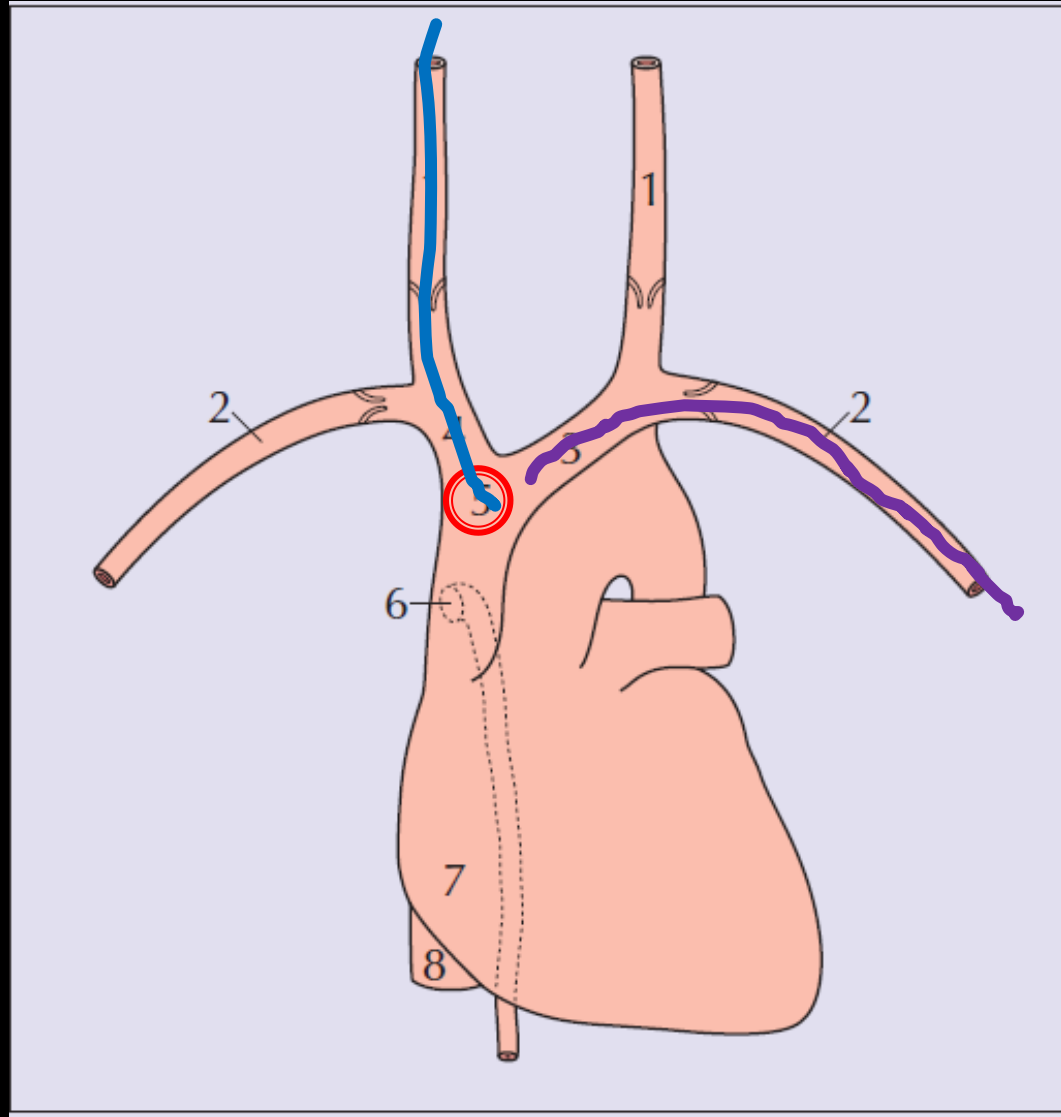
Line, tube, wire	Purpose / function	Best position for the tip
Central venous pressure line	■ Monitoring right atrial pressure	Superior vena cava or brachiocephalic vein
	■ Fluid infusion/nutrition	
	■ Drug administration	
Swan–Ganz catheter (Pulmonary arterial catheter)	■ Monitoring pulmonary arterial pressure	Main or lobar pulmonary artery
	■ To distinguish between cardiac and non-cardiac pulmonary oedema	
Nasogastric tube	■ Gastric decompression/aspiration	At least 10 cm beyond the gastro-oesophageal junction
	■ Nutrition	
Nasoenteric tube	■ Nutrition	Beyond the gastric pylorus

Lines, Tubes and Catheters

Line, tube, wire	Purpose/ function	Best position for the tip
Intercostal drain (thoracostomy tube)	■ Drainage of a pneumothorax/ pleural effusion	In the pleural space
Endotracheal tube	■ Assisted ventilation	5–7 cm above the carina
Tracheostomy tube	■ Assisted ventilation	See p. 188.
Tunnelled venous catheter/ Hickman line	■ Prolonged venous access ■ Nutrition ■ Chemotherapy administration	Junction of superior vena cava and right atrium
Oesophageal Doppler probe	■ Monitoring cardiac output via measurement of blood velocity in the descending aorta	Mid oesophagus

Central venous catheter

太淺：量測CVP 不準確 易產生血栓
太深：進入RA or RV, 造成Arrhythmia



**SVC starts at
the first Rt ICS**

**Cavoatrial
junction**

Fig. 13.2 Vessels:
1 = internal jugular vein;
2 = subclavian vein;
3 = left brachiocephalic
vein; 4 = right
brachiocephalic vein;
5 = SVC; 6 = orifice of
the azygos vein;
7 = right atrium;
8 = inferior vena cava.

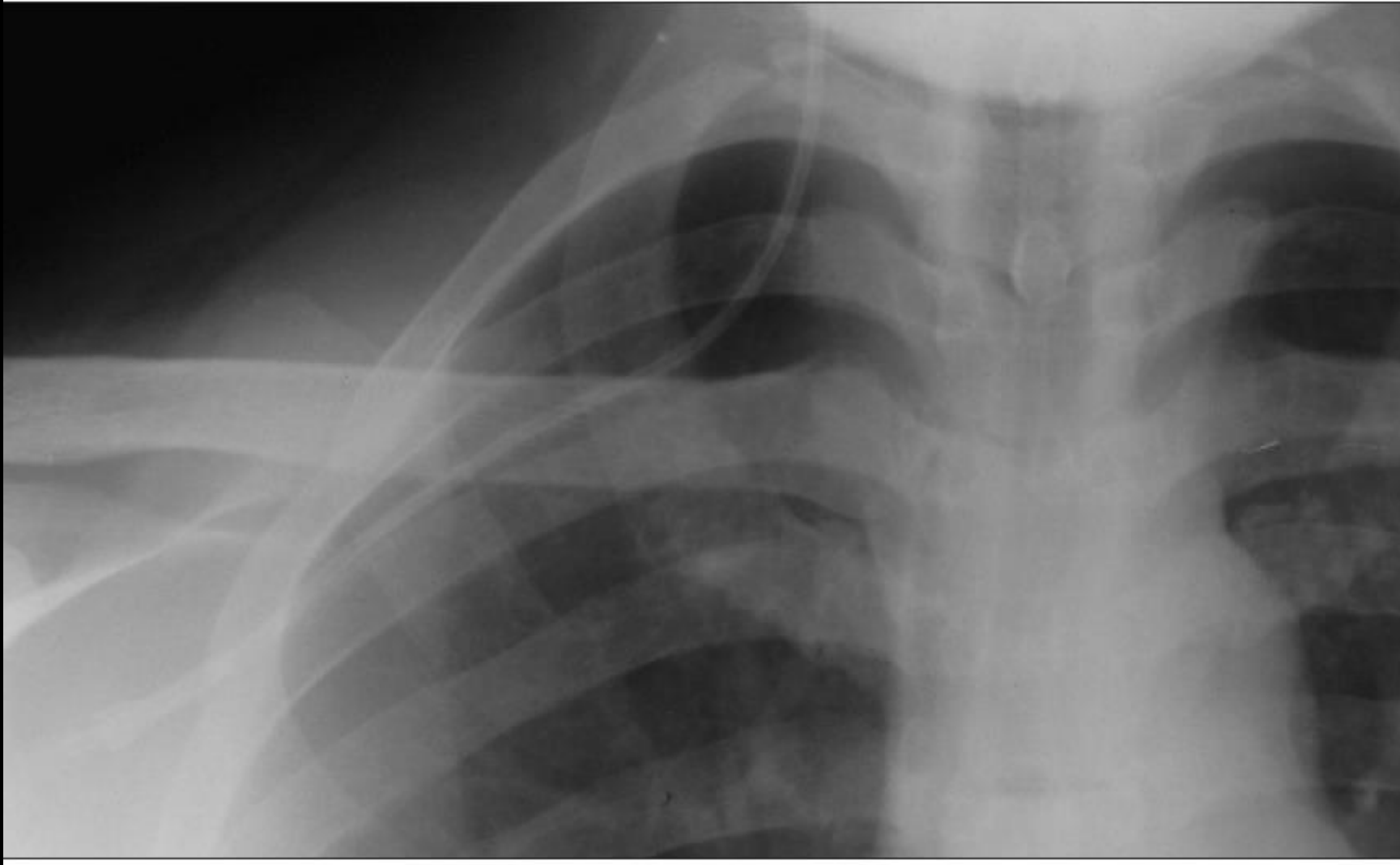


Figure 13.5 *Right internal jugular line in good position. (Retouched.)*

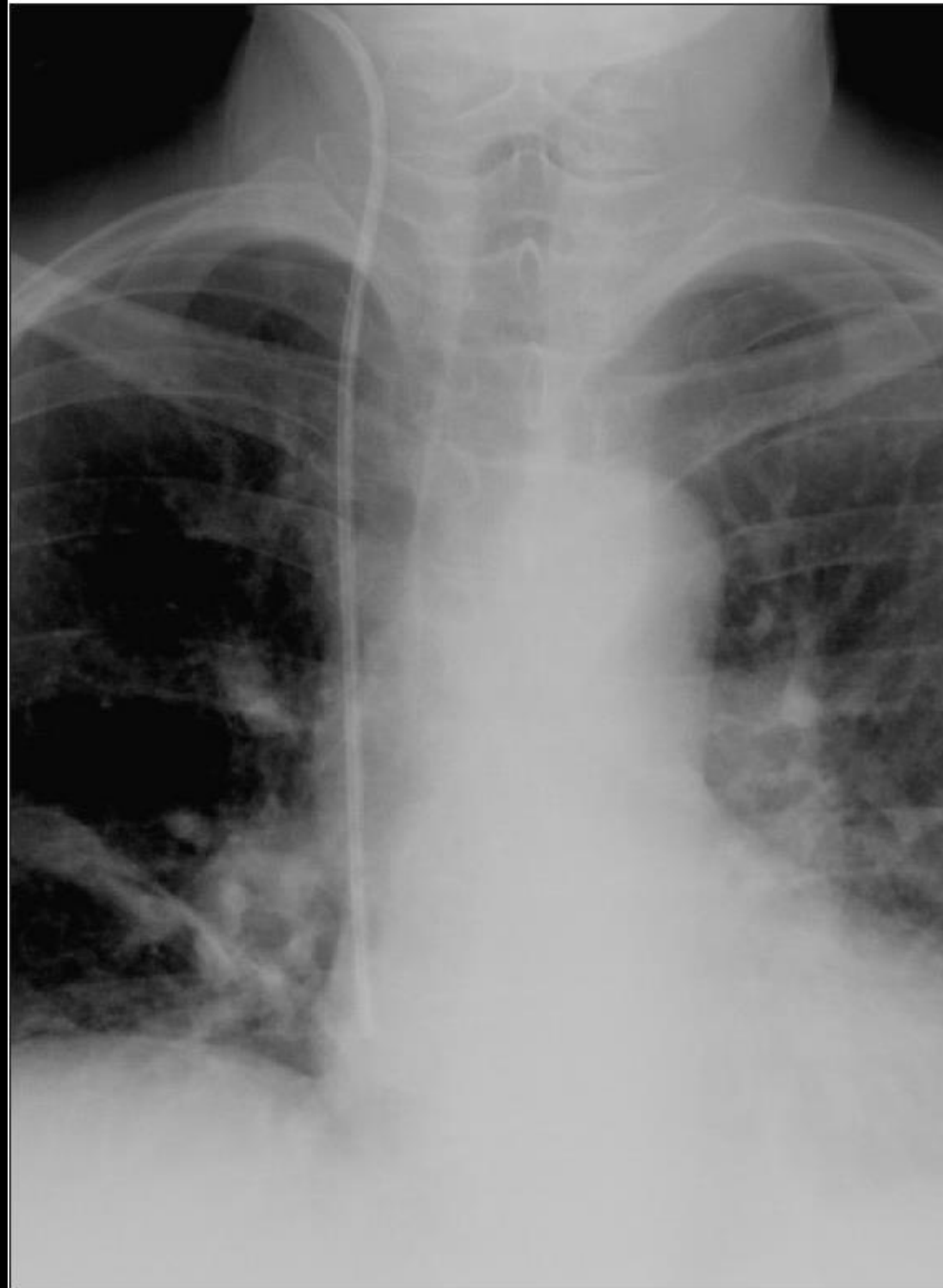


Figure 13.6 *Right subclavian line in good position with its tip in the SVC. The SVC commences at the level of the right first anterior intercostal space. (Retouched.)*

Malposition

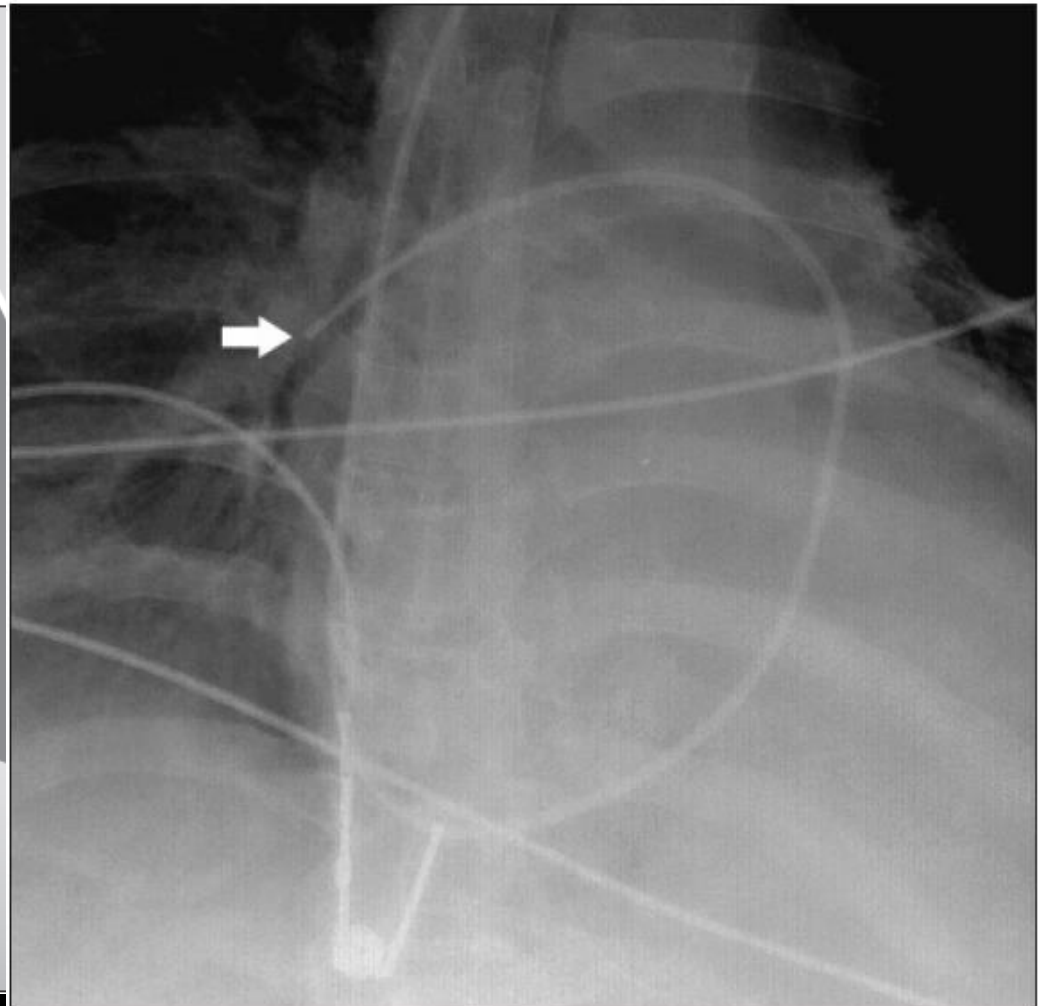
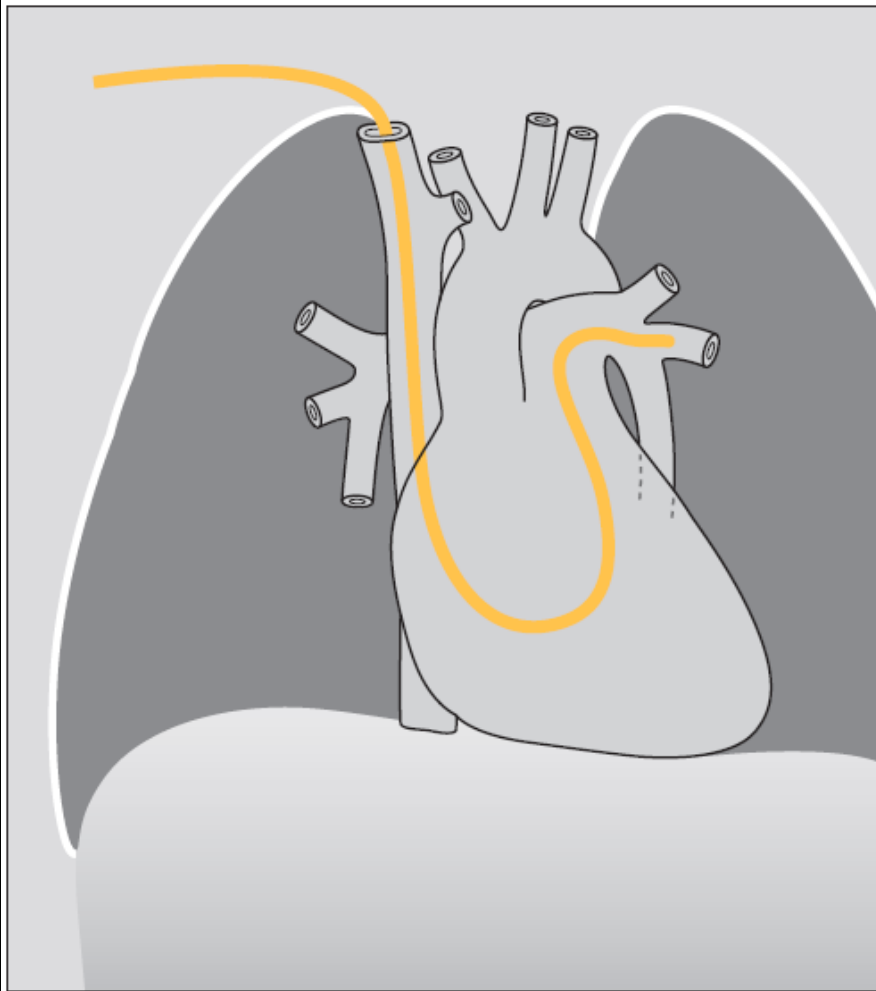


Malposition

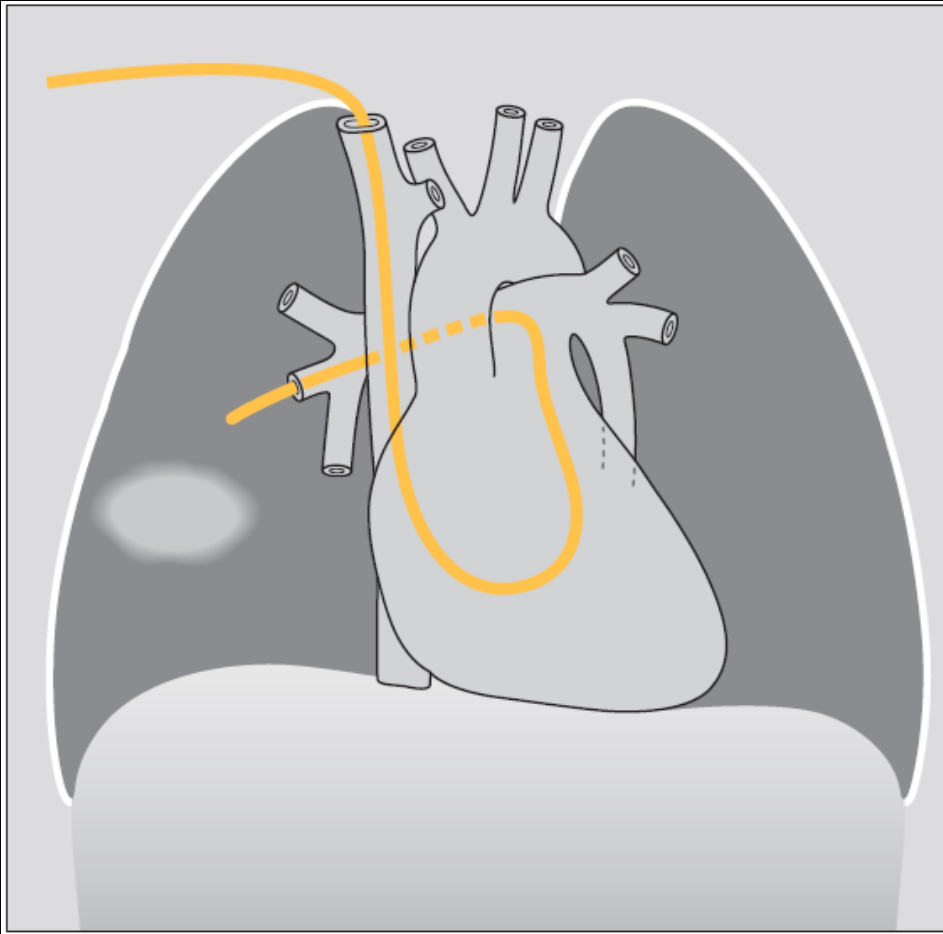


Swan-Ganz Catheter

The tip overlies the border of the heart



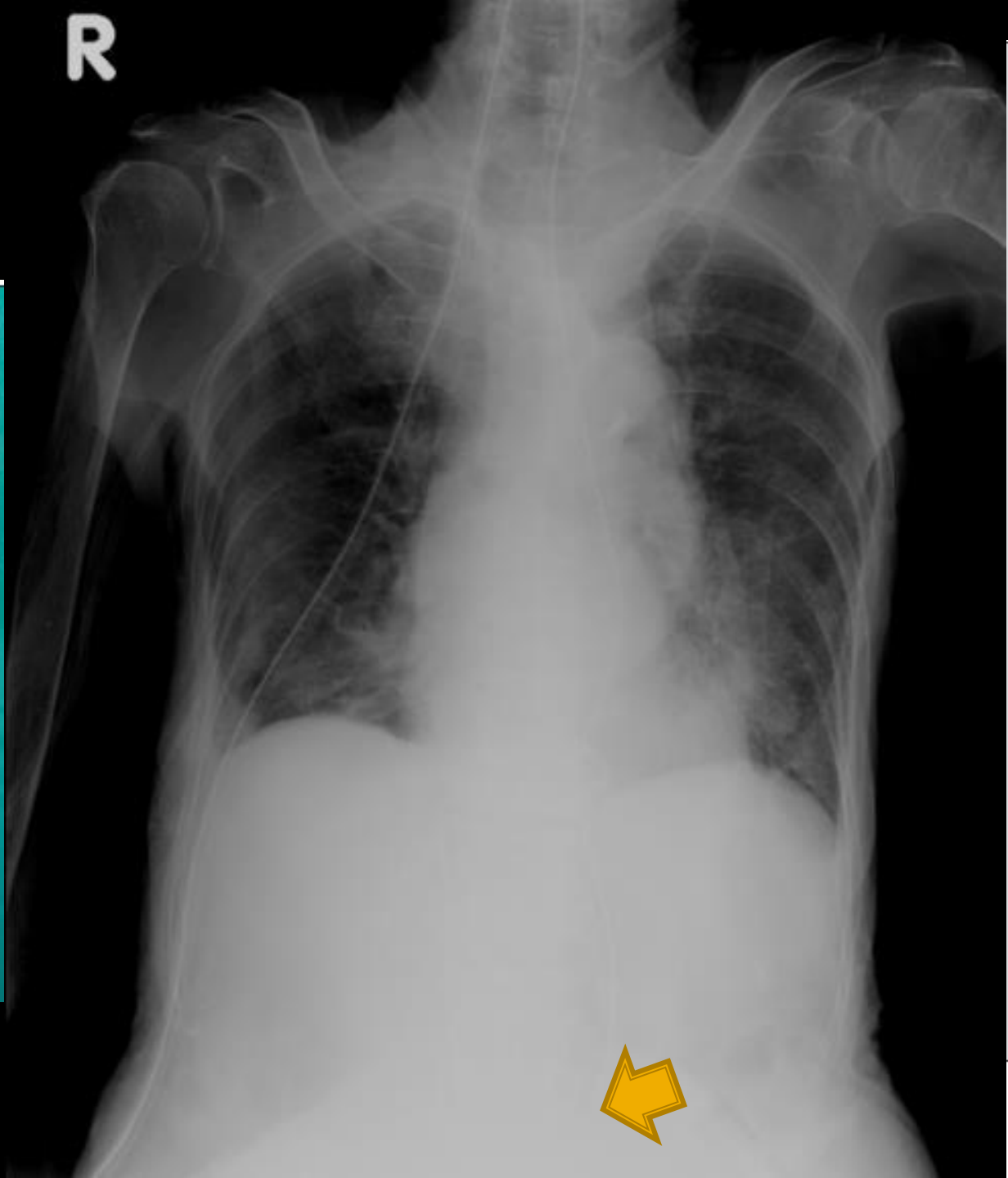
The Tip Beyond the Mediastinum



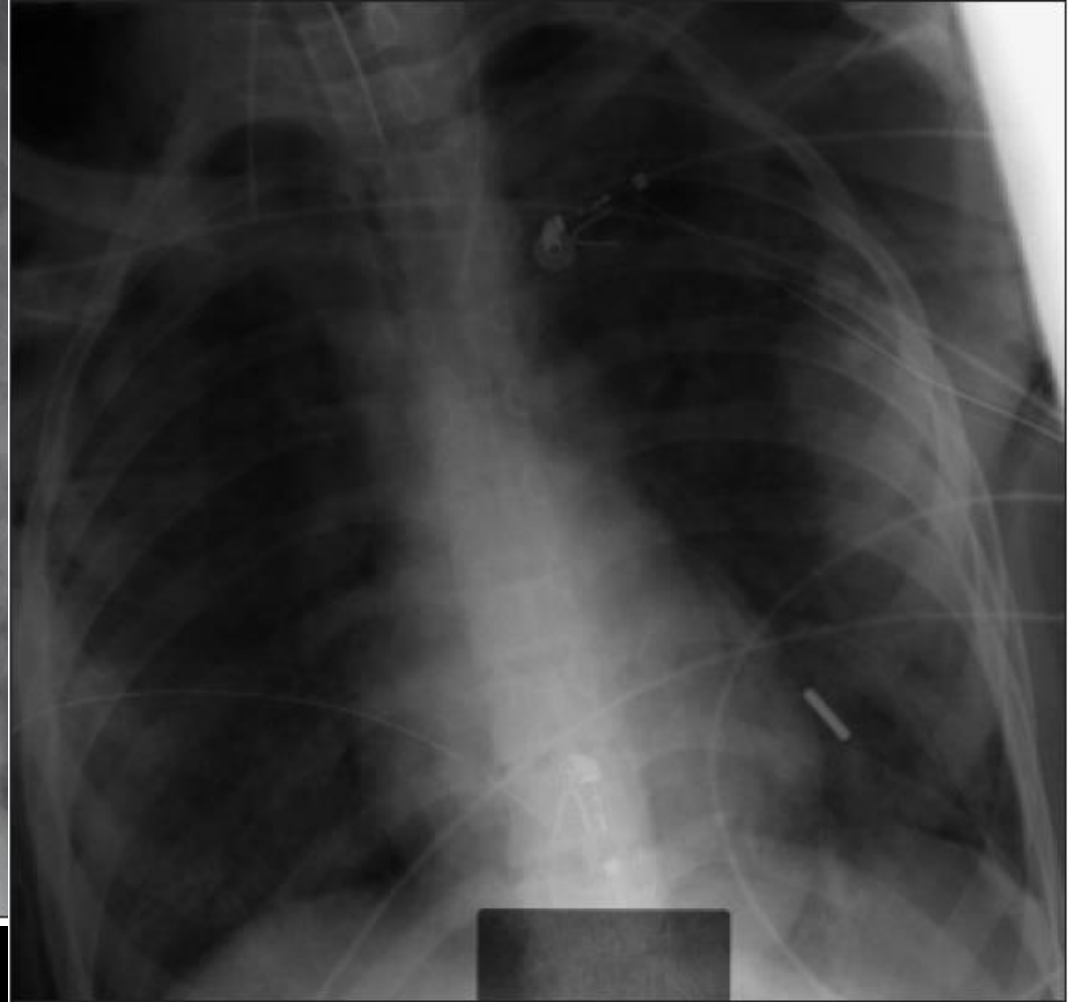
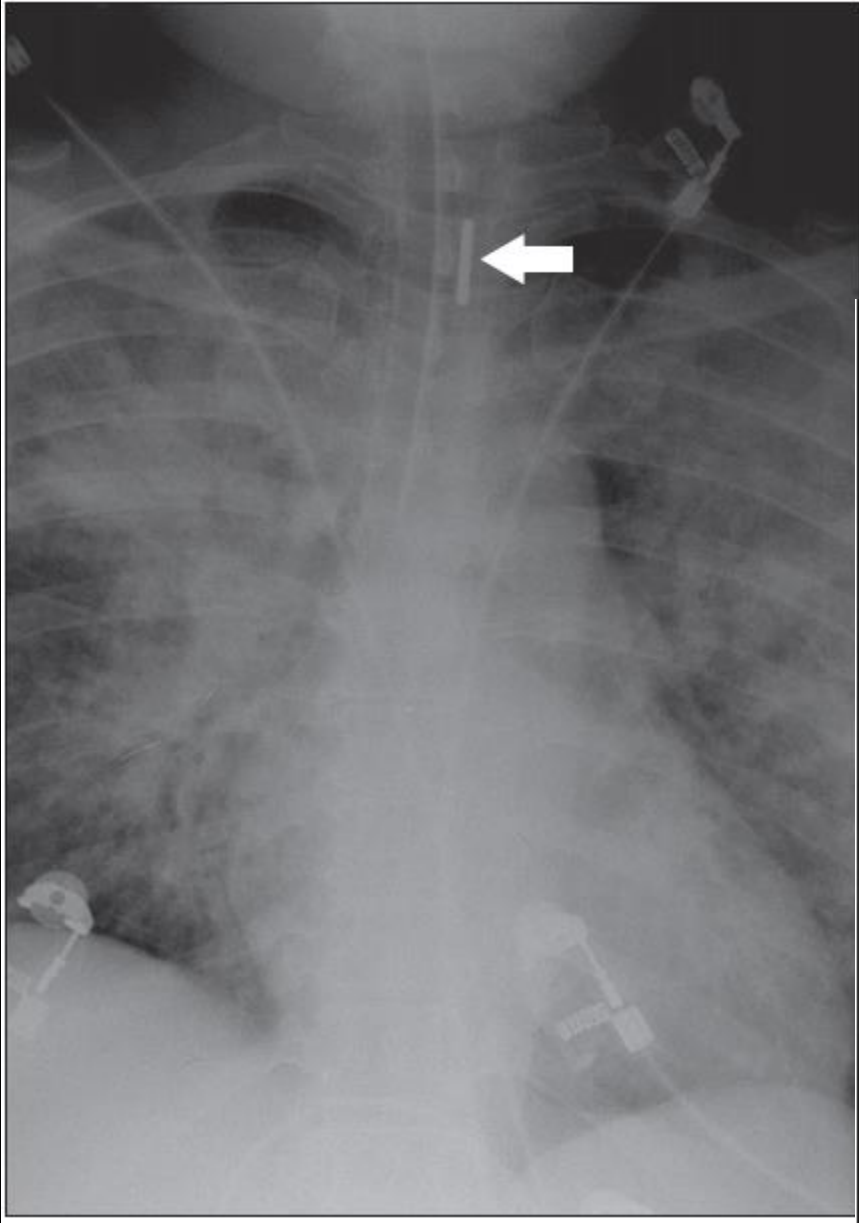
NG Tubes



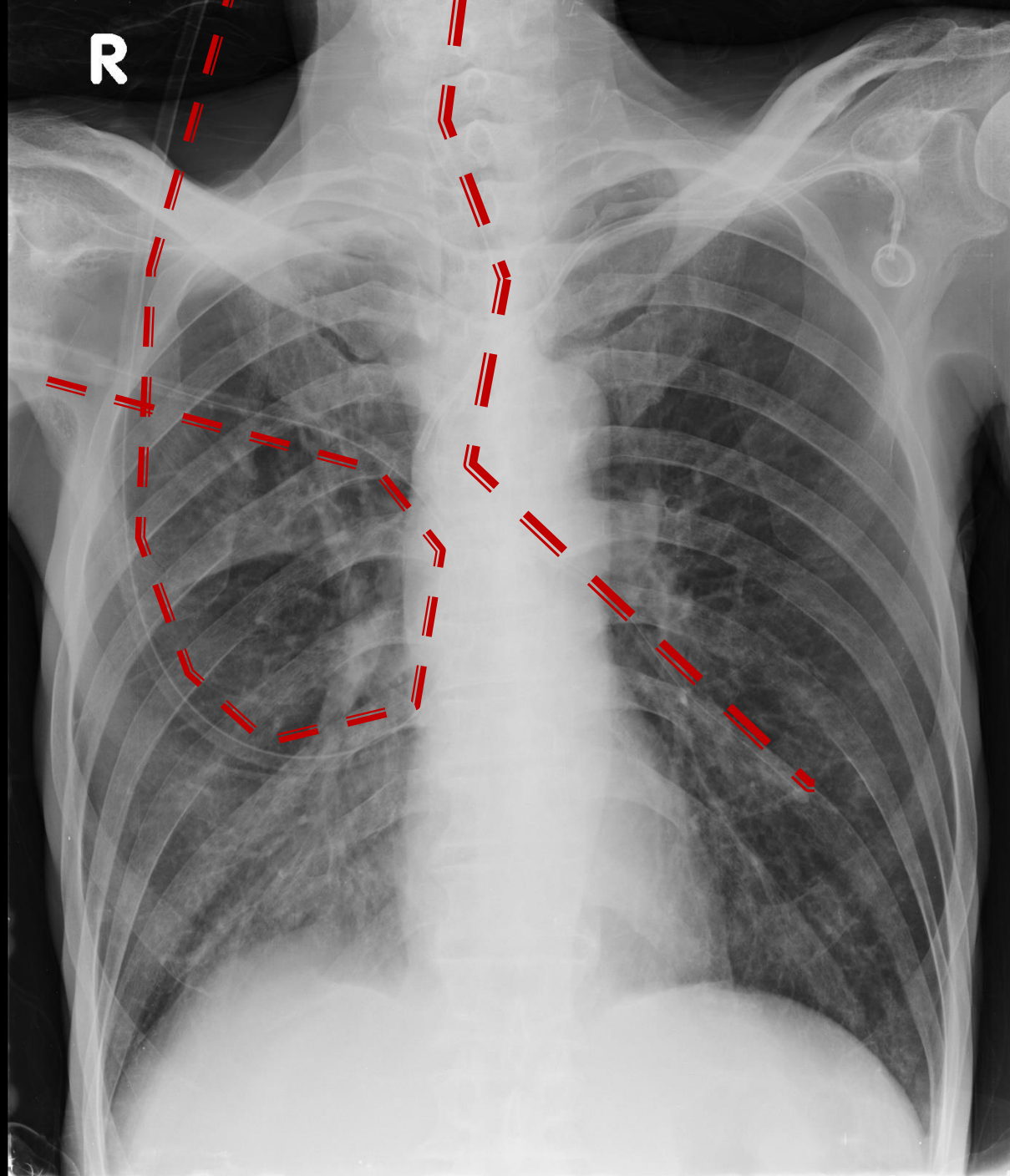
10 cm



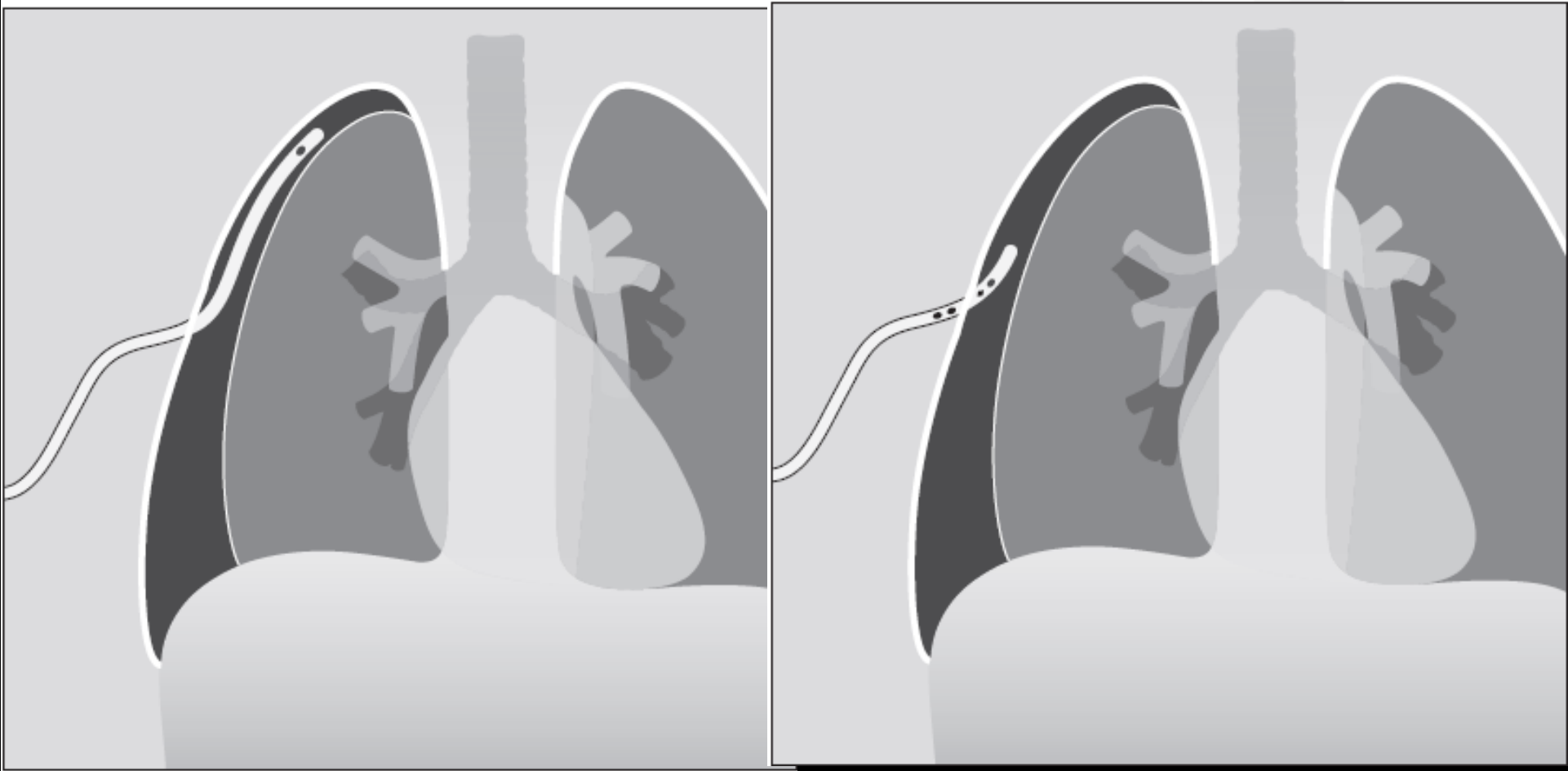
Malposition







Chest Tubes



Pneumothorax

AP
ERECT



Endotracheal tube

- 5-7 cm to carina

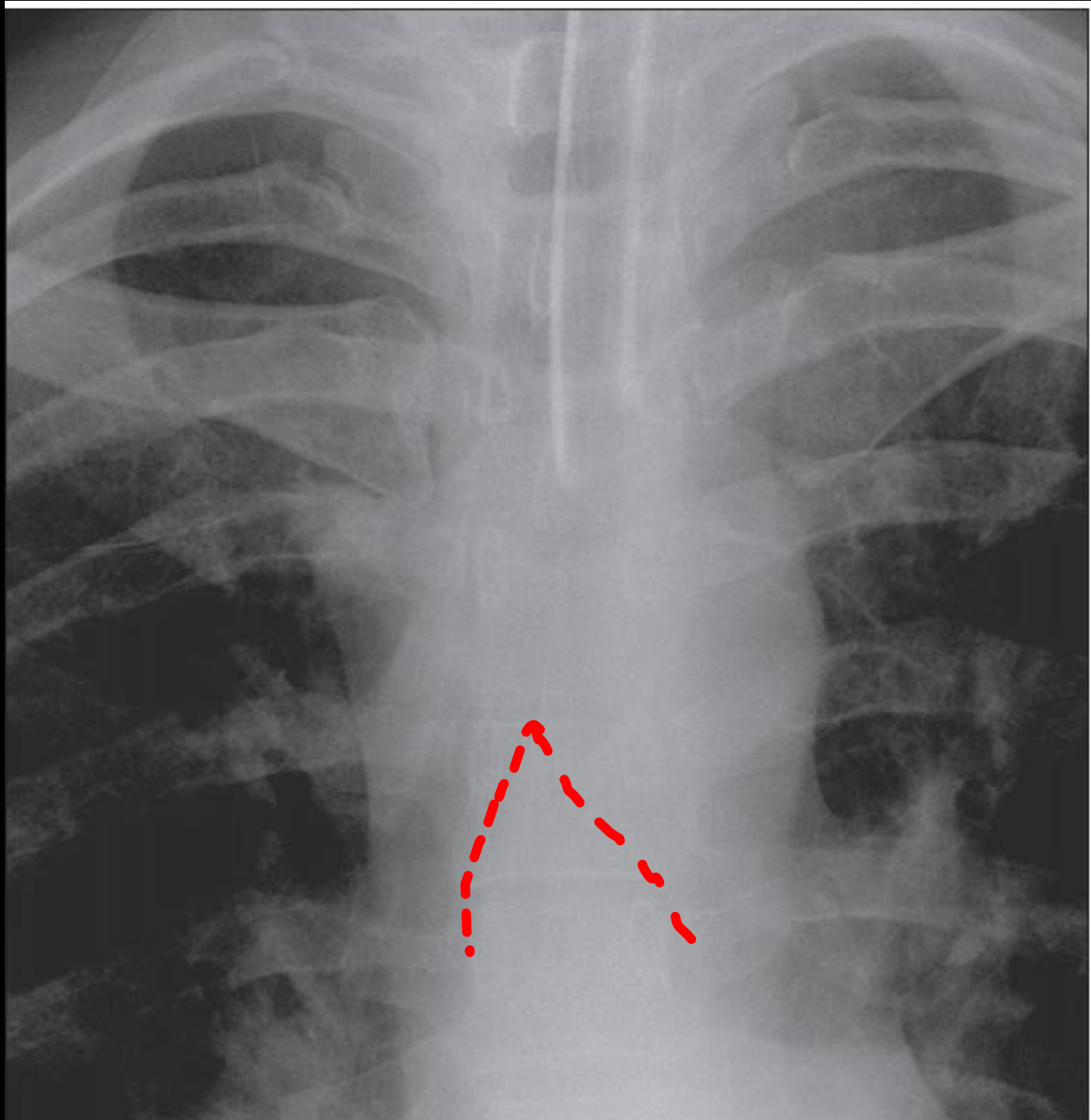


Table 13.2 ETT problems.

ETT malposition 1

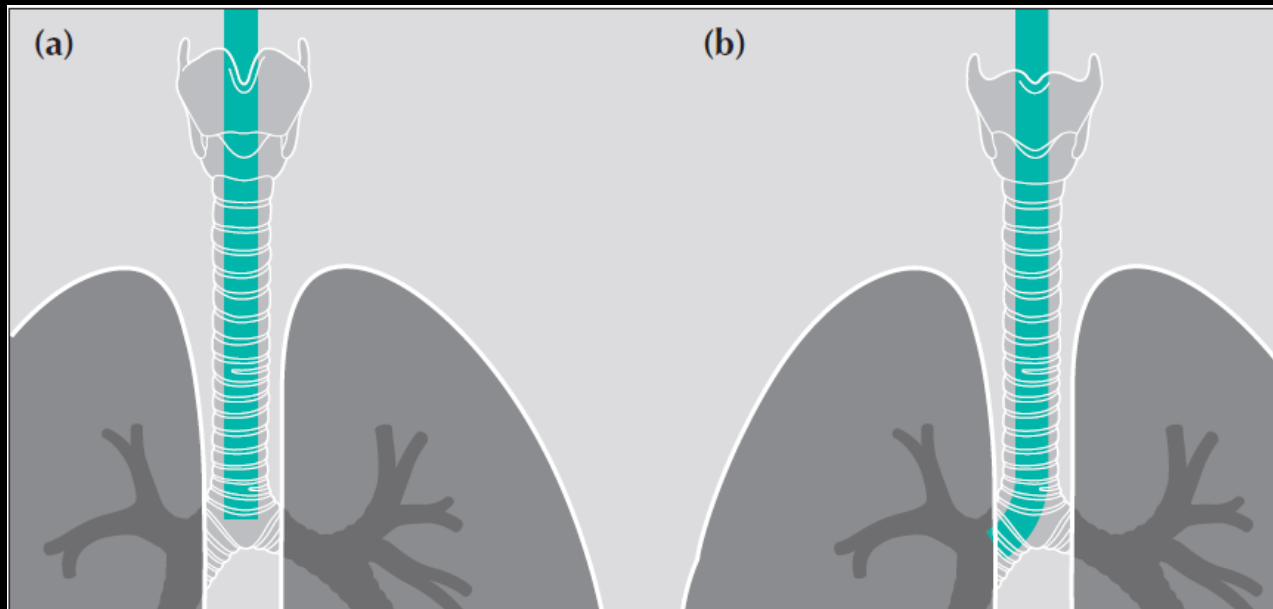
Tip in the right main bronchus. May cause:

- Left lung collapse
- And/or: right upper lobe collapse
- Or: right lung over-distension and pneumothorax.

ETT malposition 2

Tube in the oesophagus. CXR evidence:

- ETT lateral to the tracheal air shadow
- Oesophagus distended with air
- Stomach distended with air





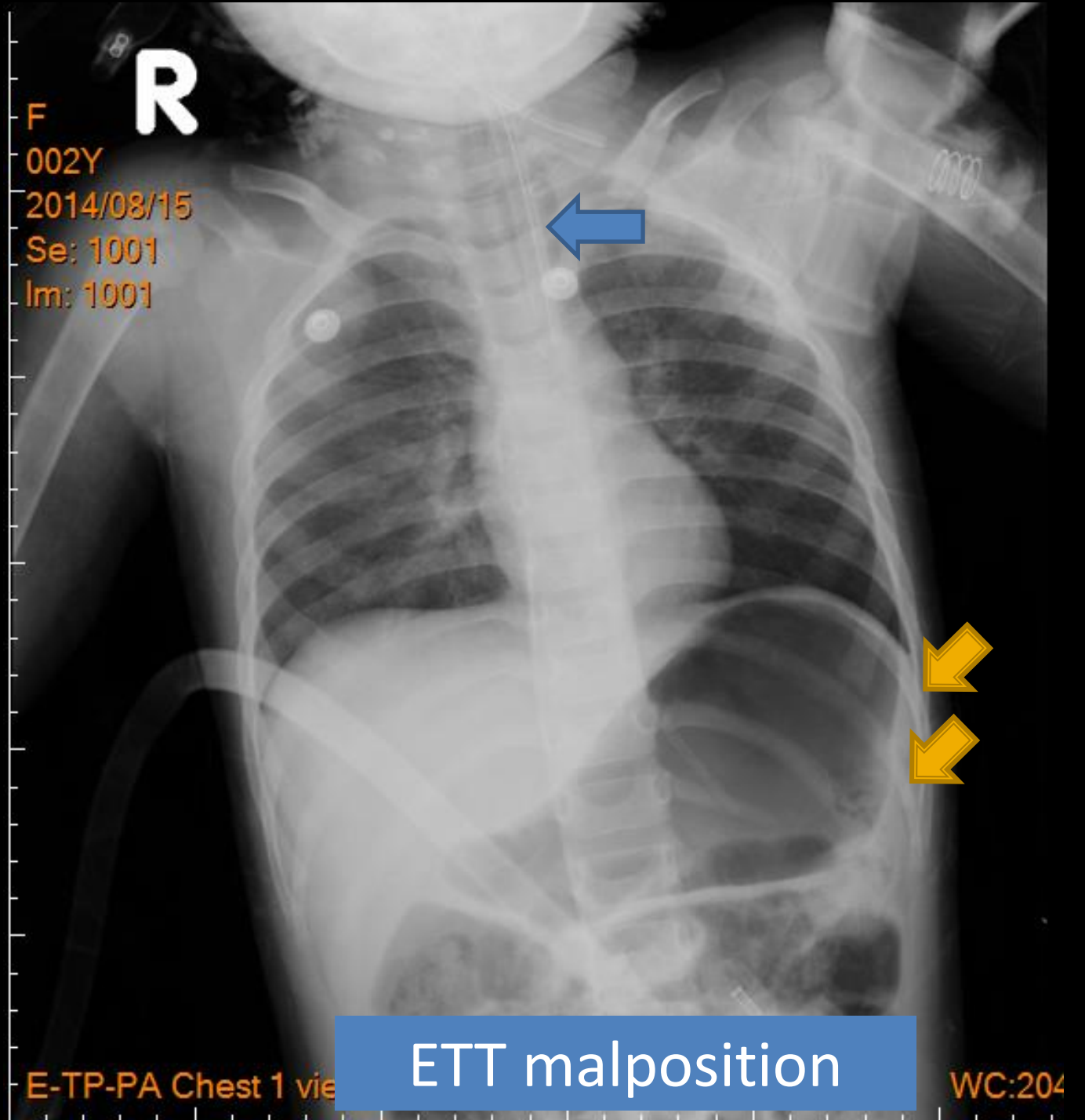
**SUPINE
Portable**

110@6.4
2200

ETT malposition 2

Tube in the oesophagus. CXR evidence:

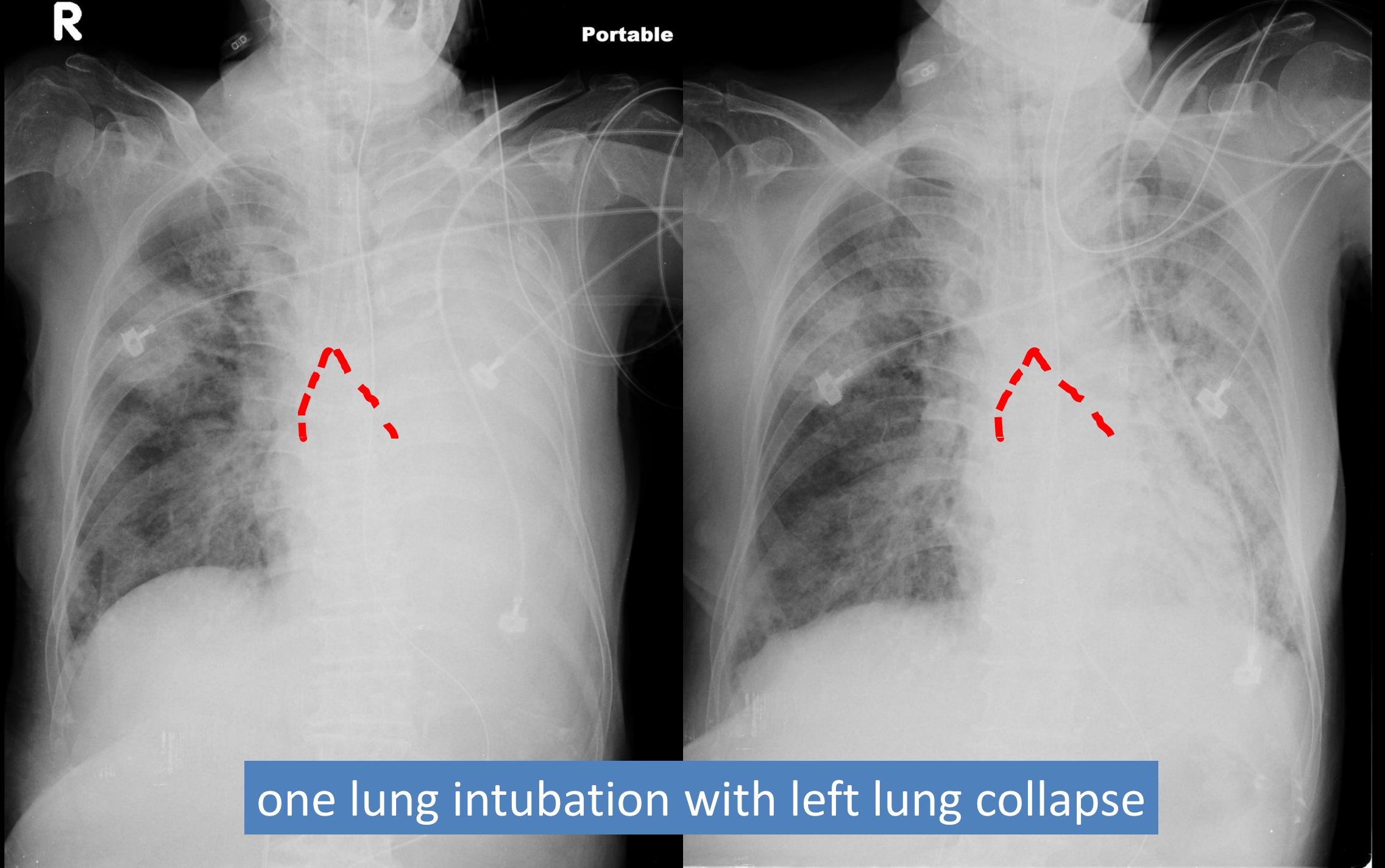
- ETT lateral to the tracheal air shadow
- Oesophagus distended with air
- Stomach distended with air





R

Portable



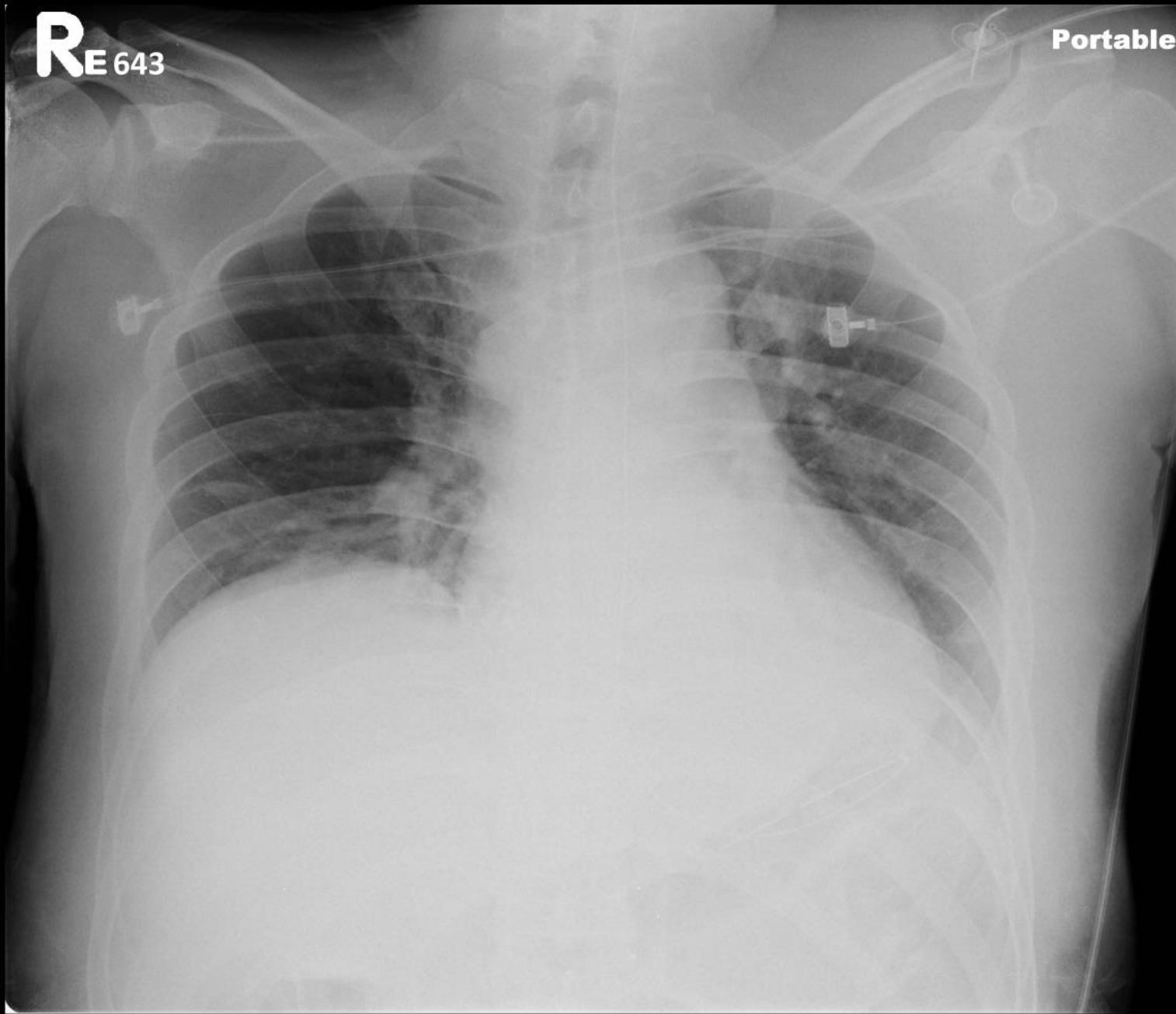
one lung intubation with left lung collapse

#13
66 / M



RE 643

Portable



Catheter & Tube Malposition (1/2)

導管 / 管路位置異常 — 最高頻類別 (n=6)

22

ET tube & NG tube malposition

Shocked ICU patient; both tubes malpositioned on CXR

22

ET tube too shallow + CVP catheter

Right IJ CVP; concurrent left PTX + lung abscess

22

Single-lung intubation

ET tube past carina, right main bronchus — LLL collapse

Catheter & Tube Malposition (2/2)

導管 / 管路位置異常 — 最高頻類別 (n=6)

23

NG tube into lung parenchyma

Hemodialysis patient; tube tip pierced lung, not stomach

23

Pigtail catheter post-drainage

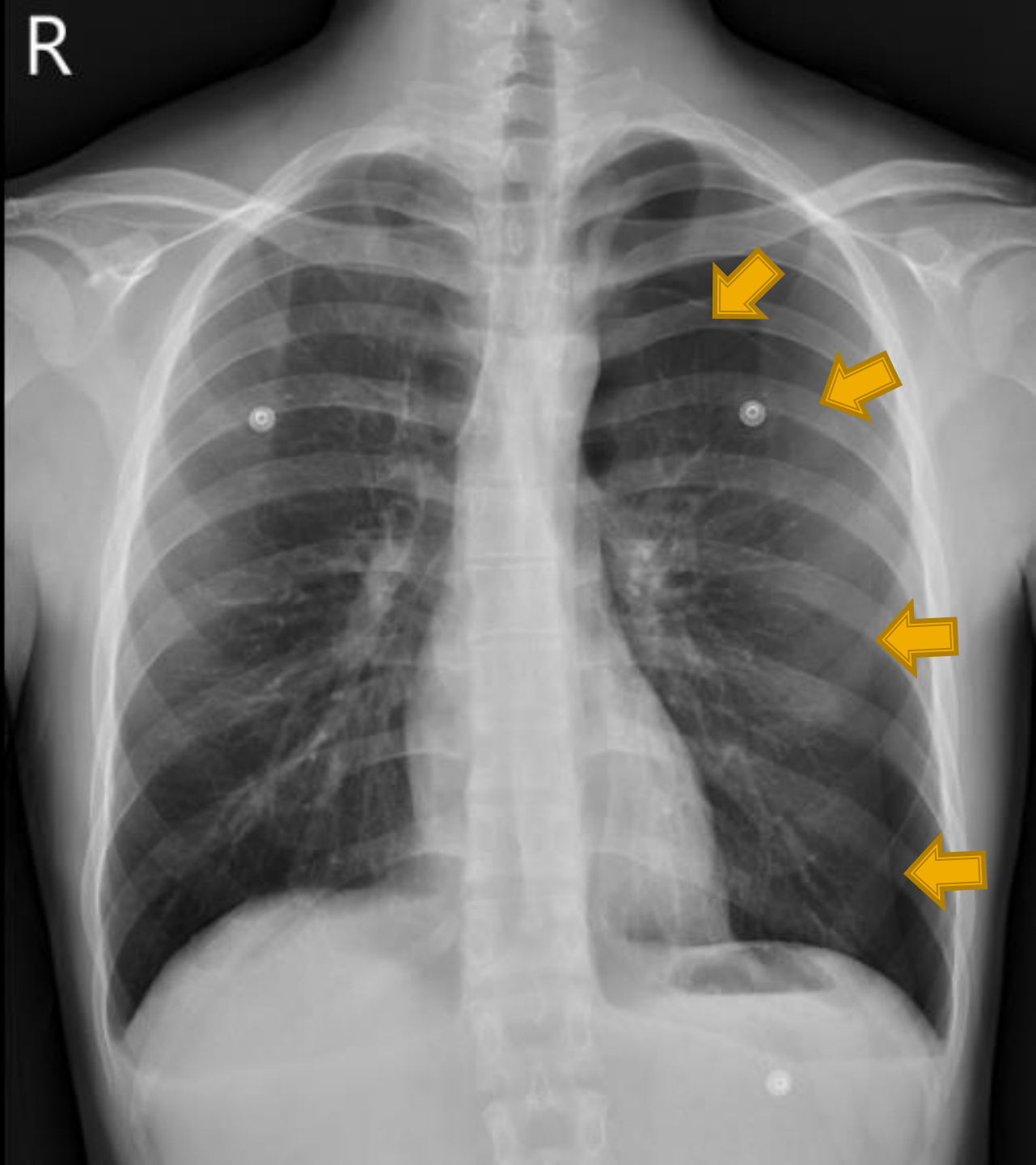
Alongside diffuse + subcutaneous emphysema in a heavy smoker

25

Port-A catheter malposition

Catheter tip looped into internal jugular vein instead of SVC/right atrium

Pneumothorax

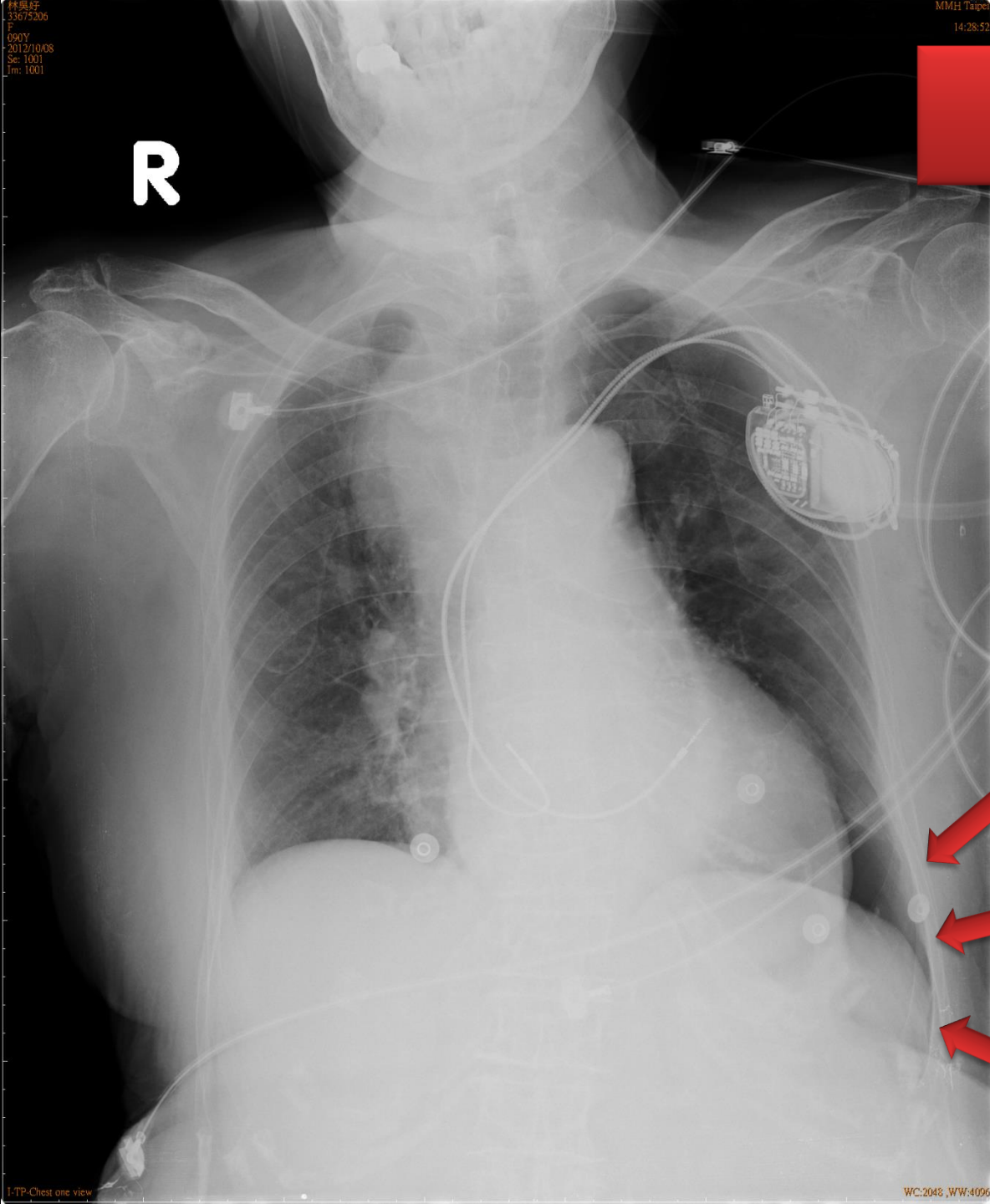


PA View

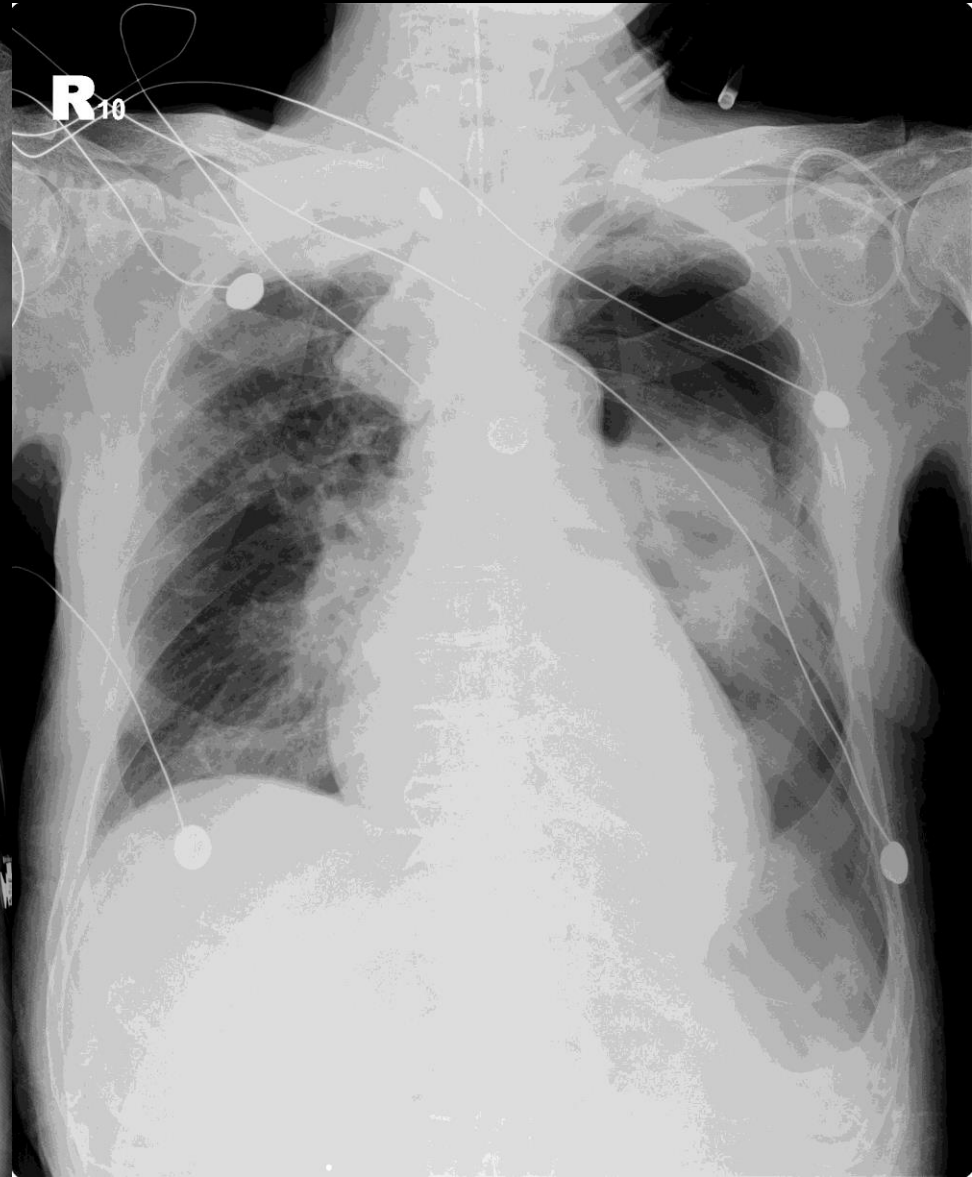
林吳好
33675206
F
090Y
2012/10/08
Se: 1001
Im: 1001

MMH Taipei
14:28:52

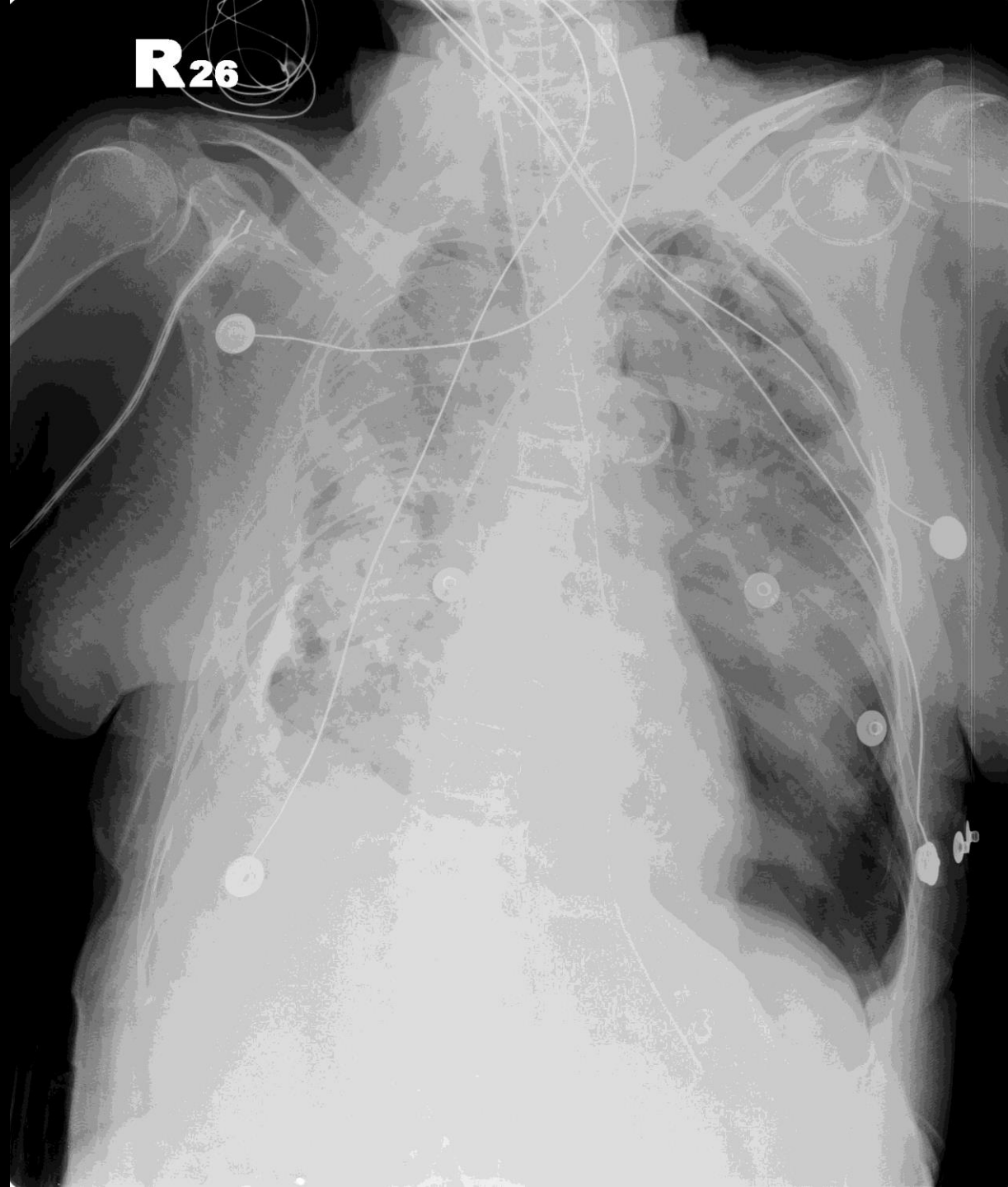
Deep Sulcus Sign

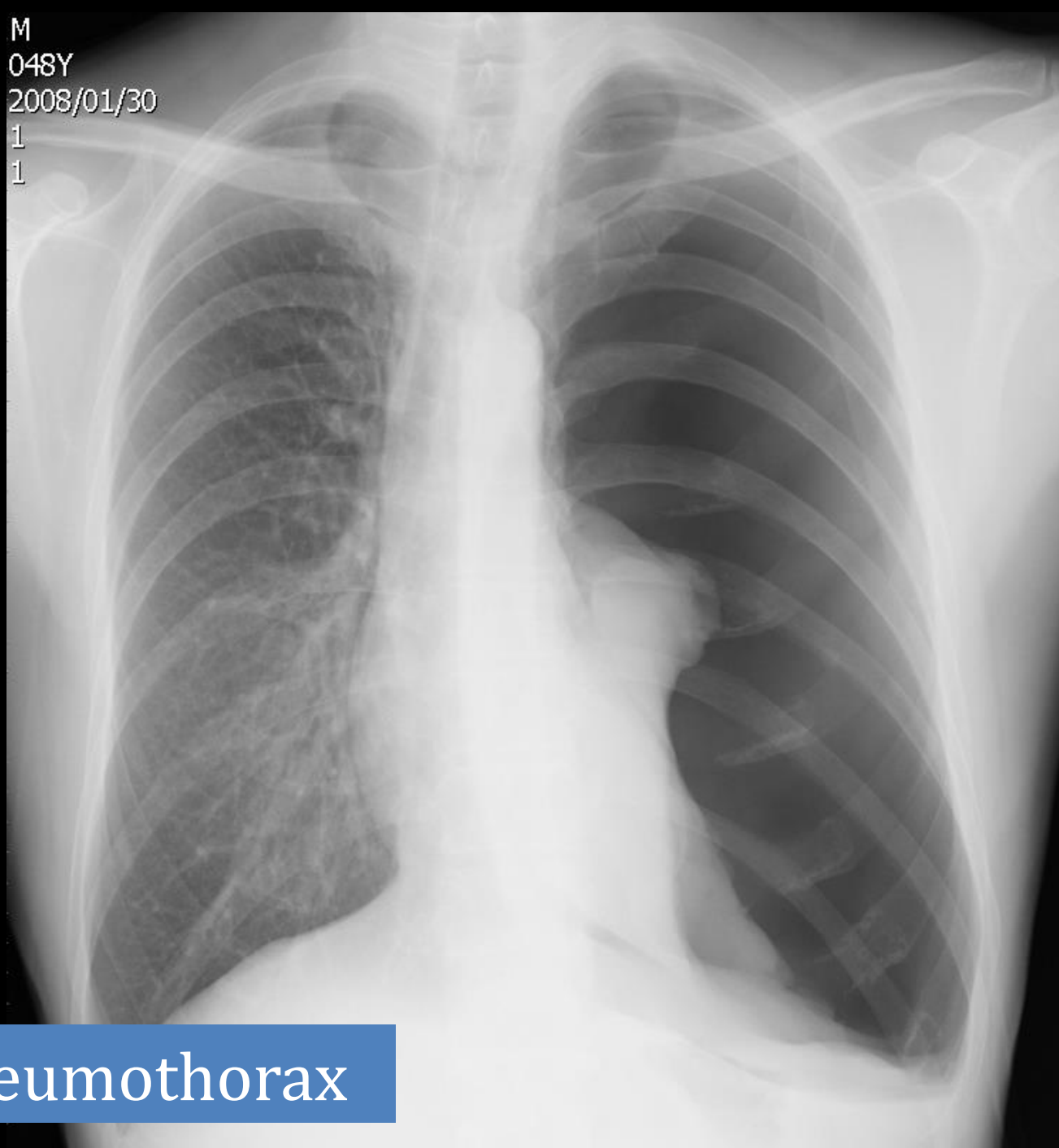


Deep Sulcus Sign



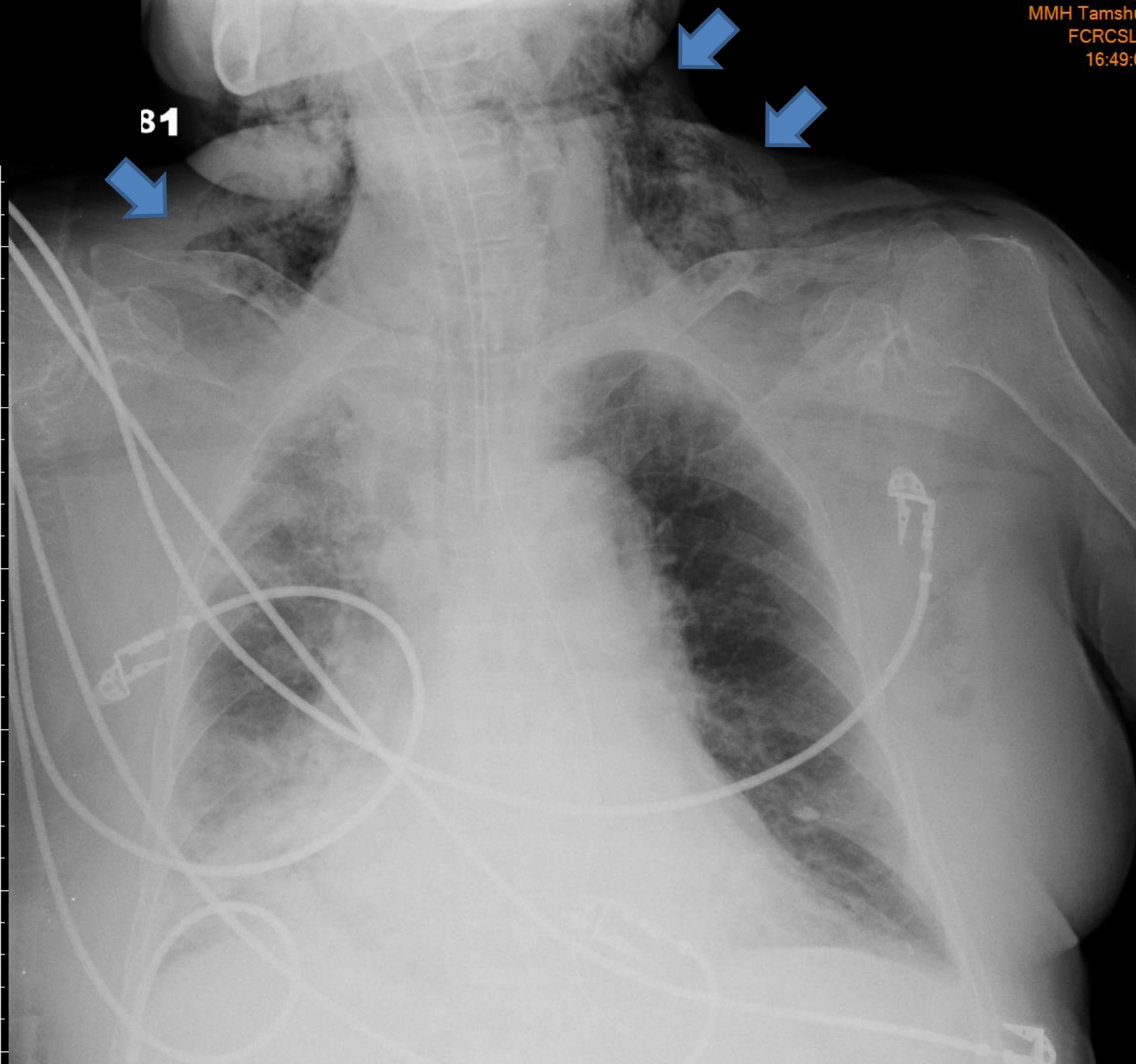
R26

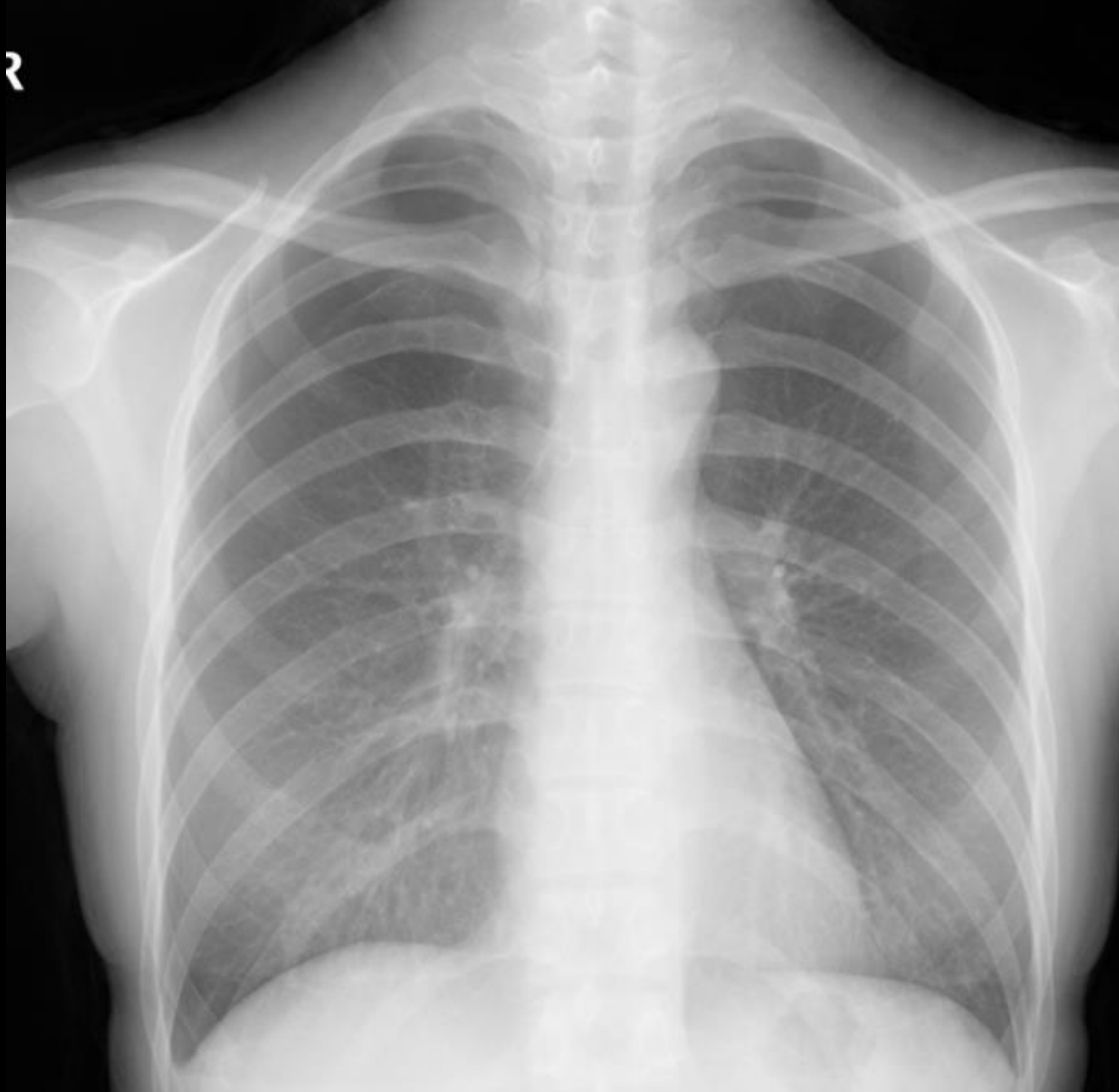




Tension Pneumothorax

31





35 / F
Chest pain

Pneumothorax Family (1/2)

氣胸家族 (n=5)

22

Left pneumothorax

Concurrent right lung abscess and ETT malposition, same film

23

Massive pneumothorax

Near-complete lung collapse — classic emergency pattern

24

Left pneumothorax

Isolated finding — visceral pleural line recognition

Pneumothorax Family (2/2)

氣胸家族 (n=5)

25

Drug-induced fibrosis + pneumothorax + pneumomediastinum

Combined air-leak pattern over fibrotic lung disease

25

Right hydropneumothorax (post-pneumonectomy)

Post-surgical air-fluid level in the pneumonectomy space

Pneumomediastinum

縱膈氣腫 ($n=4$)

21

AIDS + PJP pneumonia

Air-leak complicating severe Pneumocystis pneumonia

21

Spontaneous, 18-year-old male

Sudden chest pain — thin-build young male, Macklin effect

23

Spontaneous, 21-year-old male

Same demographic pattern — recurring exam favorite

25

With pneumothorax (drug-induced fibrosis)

Combined air-leak pattern (cross-listed)

Esophageal Perforation & Mediastinitis

食道穿孔 / 縱膈炎 (n=3)

21

Esophageal perforation with mediastinitis

Boerhaave-pattern — mediastinal widening with air

24

Descending mediastinitis

Infection tracking from neck/upper airway into mediastinum

24

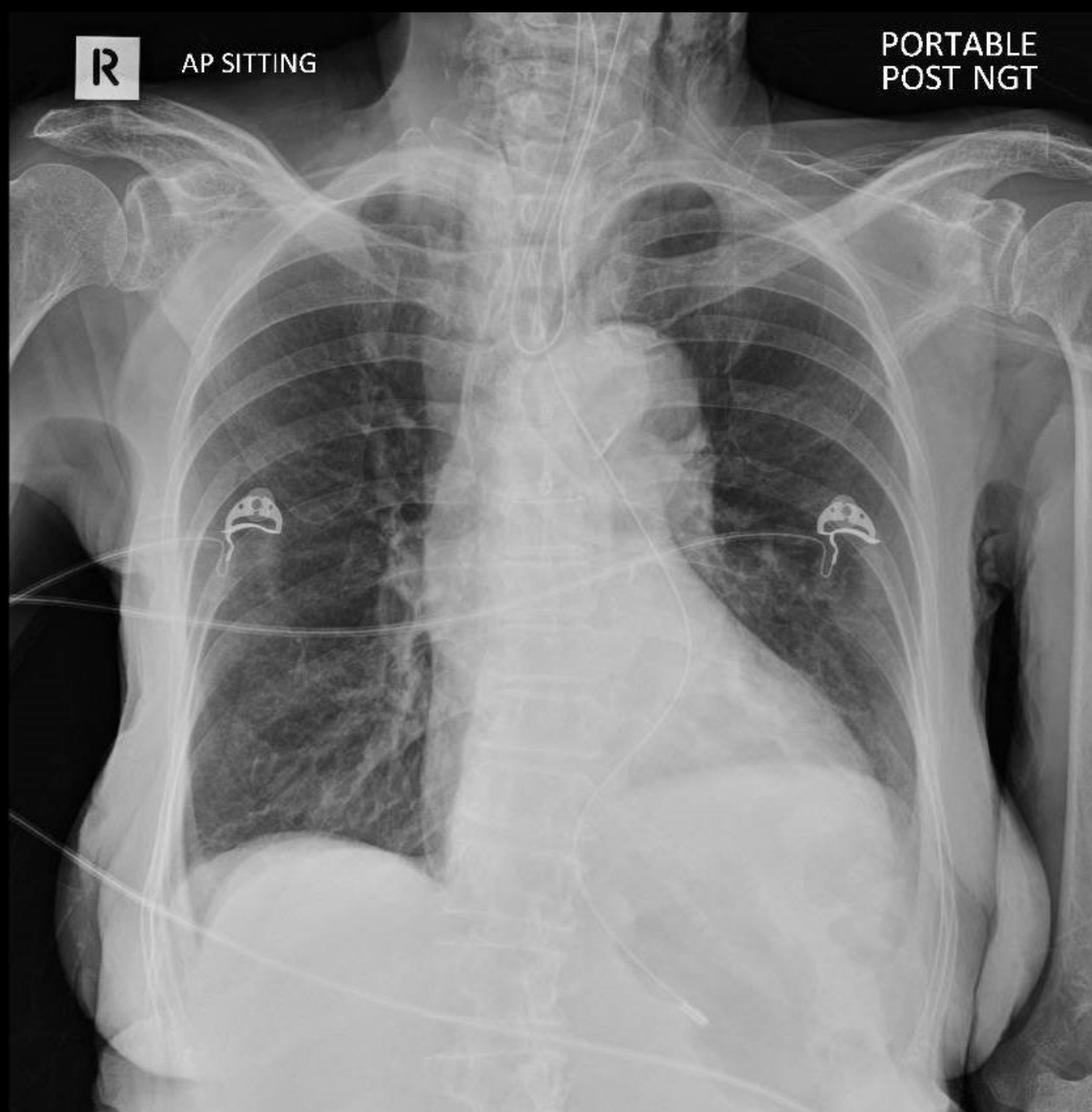
Post-esophagectomy anastomotic leak

Leak at anastomosis site causing empyema

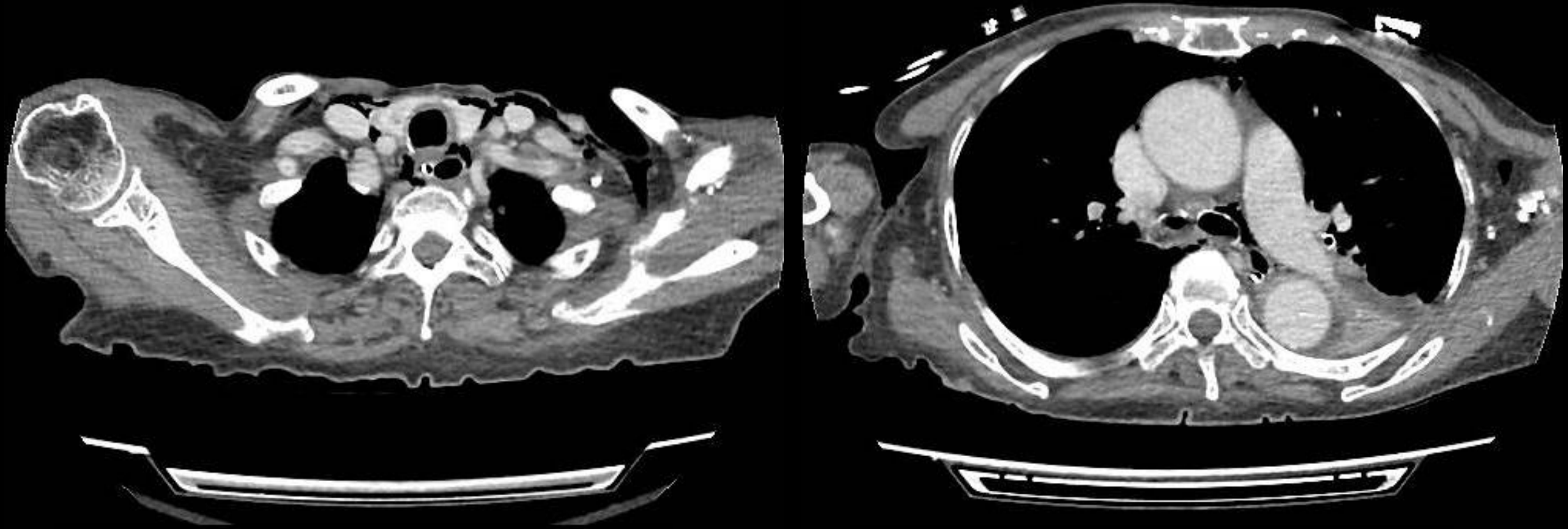
#22 26F



Admitted for community-acquired pneumonia. After-hours portable chest X-ray requested to assess nasogastric tube placement. Ward nurses unable to obtain any aspirate.



Esophageal rupture with extensive mediastinitis



Cardiogenic Pulmonary Edema & CHF

心因性肺水腫 / 心衰竭 (n=3)

22

Interlobar effusion ("phantom tumor") + CHF

Fluid in minor fissure mimicking a mass; resolves with diuresis

23

Cardiogenic pulmonary edema

Classic bat-wing perihilar opacities with cardiomegaly

23

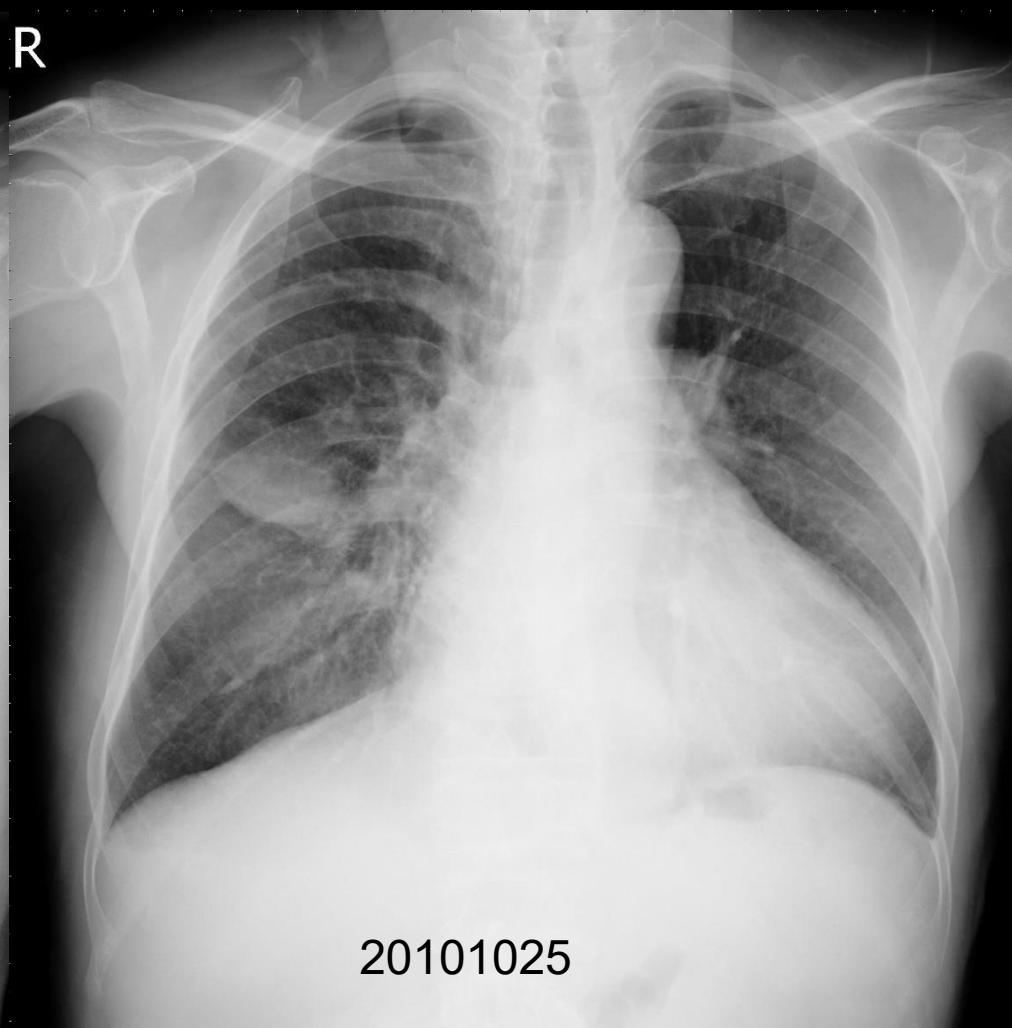
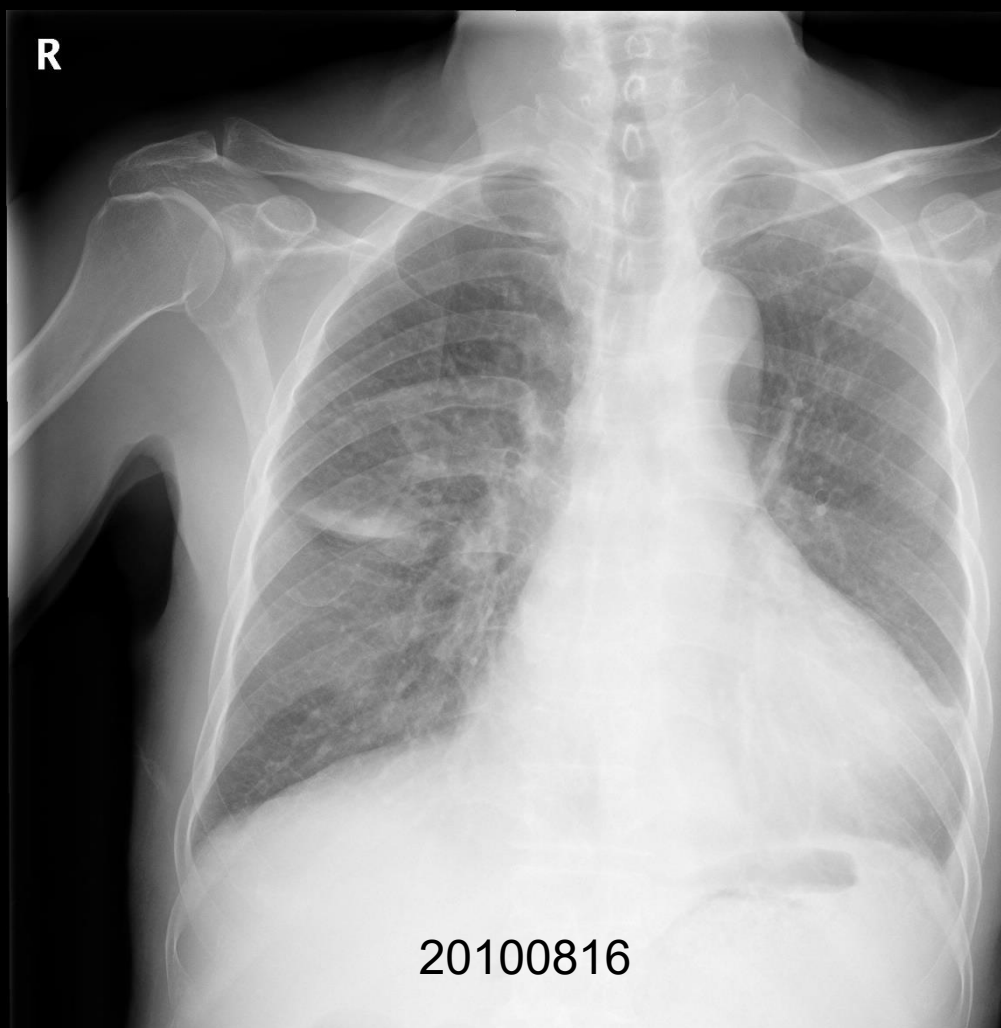
Re-expansion pulmonary edema

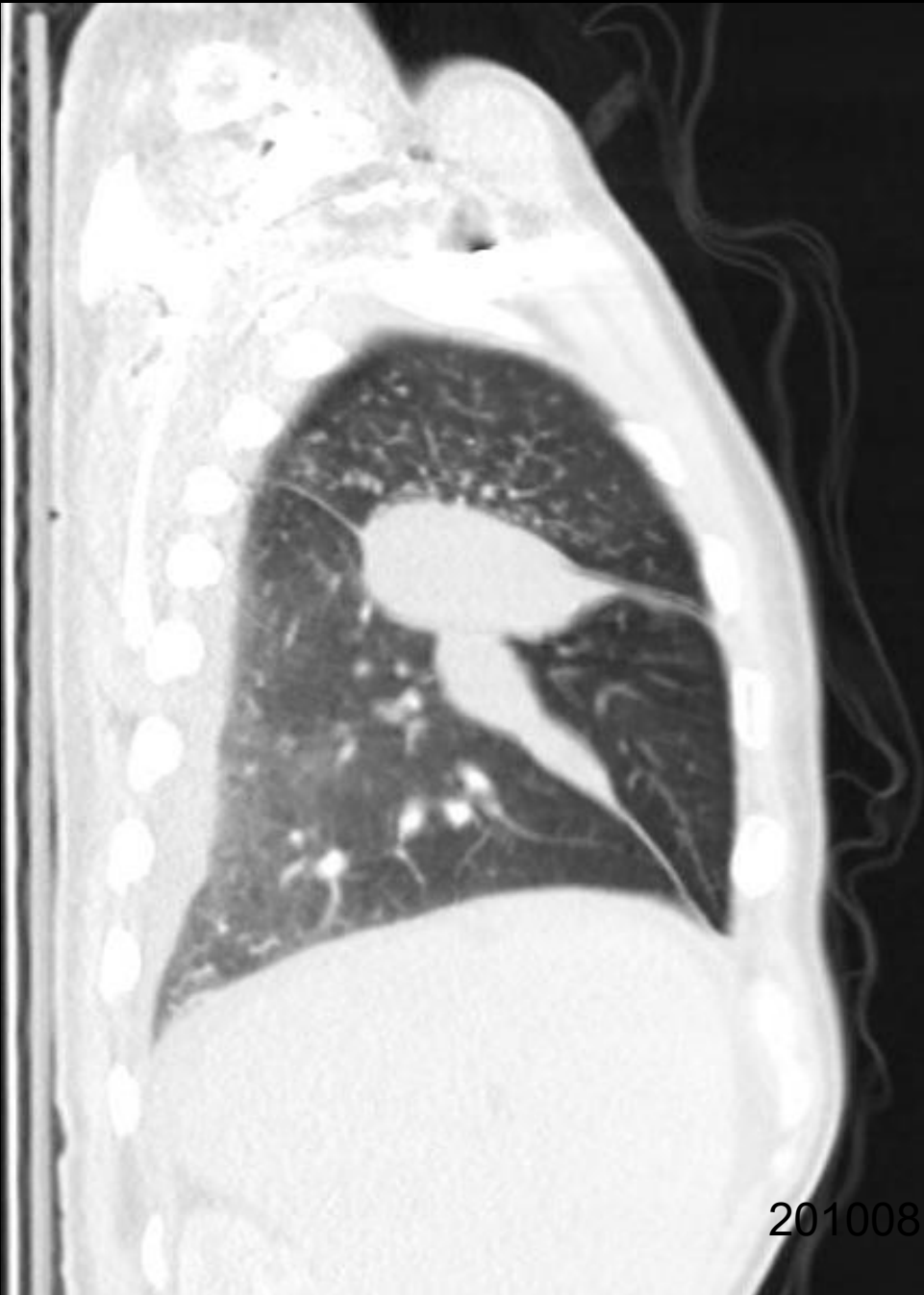
Iatrogenic — after rapid re-expansion post-drainage

24879214

- 76 y/o man
dyspnea and
cough for one
week

20100810





- Interlobular pleural effusion due to heart failure

Septic Shock & Septic Emboli

敗血性休克 / 敗血性栓塞 ($n=2$)

23

Septic shock — hollow-organ perforation

ICU patient; free air + consolidation from intra-abdominal source

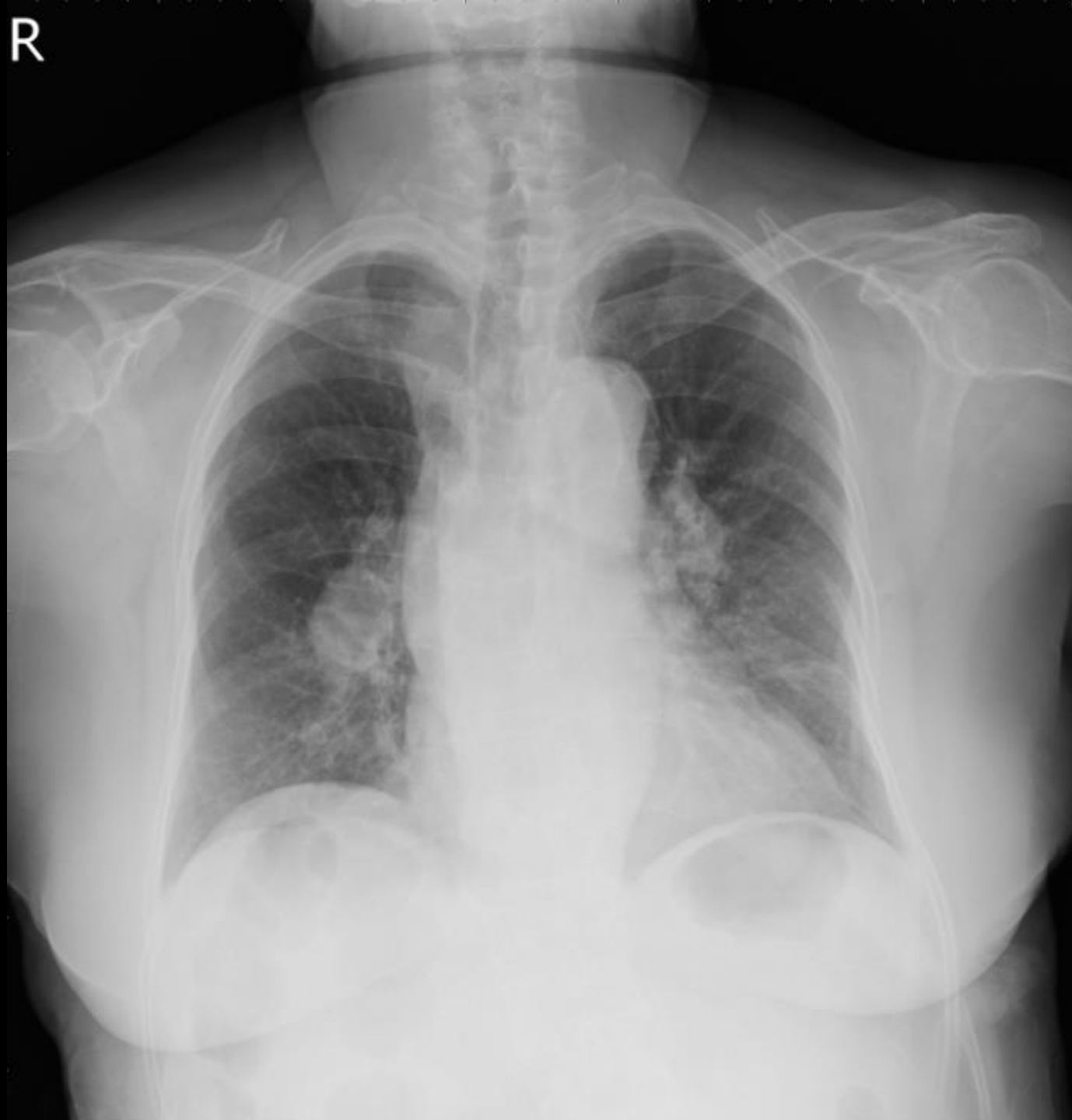
25

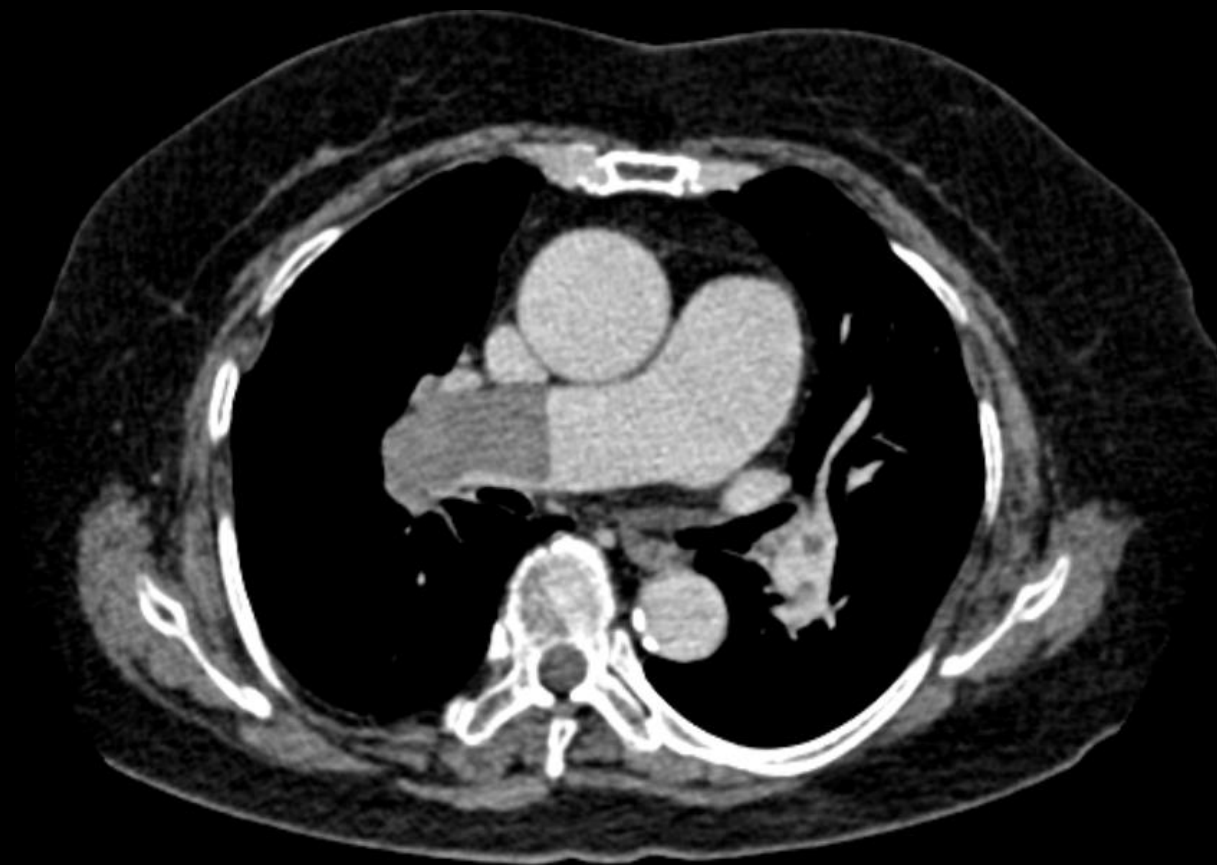
Septic pulmonary emboli

Multiple peripheral cavitating nodules — hematogenous seeding

R

76F 34246993





pulmonary embolism

RE093



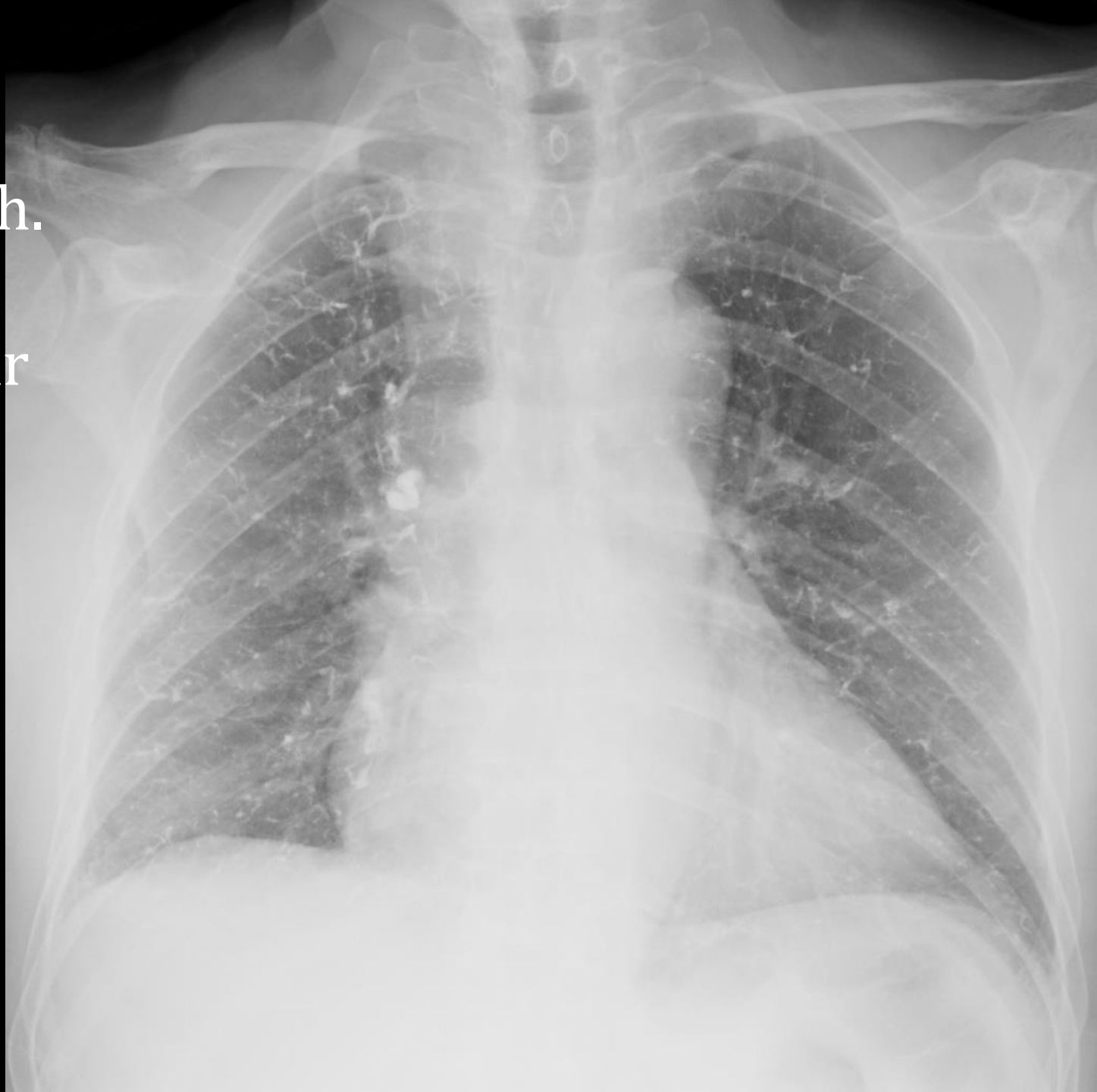
76F 48768286

sudden onset
of conscious
change and
desturation

Ekos catheter directed thrombolysis



Weakness and
shortness of breath.
Recent back pain
and treated lumbar
fracture.



Pulmonary Embolism

肺栓塞 (含醫源性) (n=2)

Acute pulmonary emboli

23

CXR often normal/subtle — Westermark sign, Hampton's hump

Cement embolism

24

Iatrogenic — vertebroplasty cement embolized to pulmonary vasculature

Trauma, Free Air & Foreign body Obstruction

外傷 / 游離氣腹 / 異物阻塞 — 容易被忽略的急症徵象

22

Flail chest with hemothorax

Trauma — multiple rib fractures with hemothorax

24

Rib fracture s/p surgical fixation

Trauma — post-operative hardware on CXR

21

Right subphrenic free air

Free air — acute-abdomen sign on CXR + LUL infiltrate

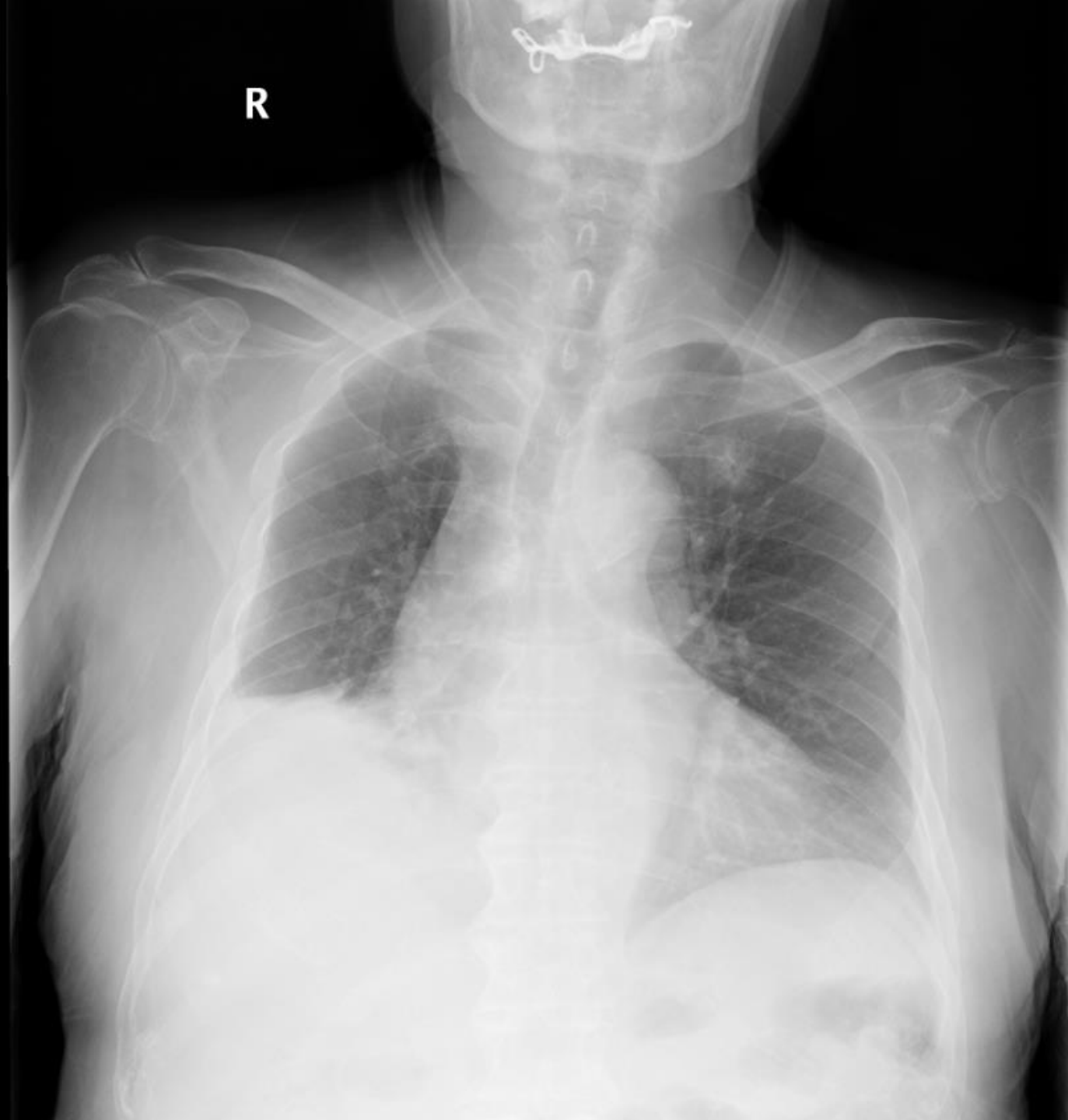
25

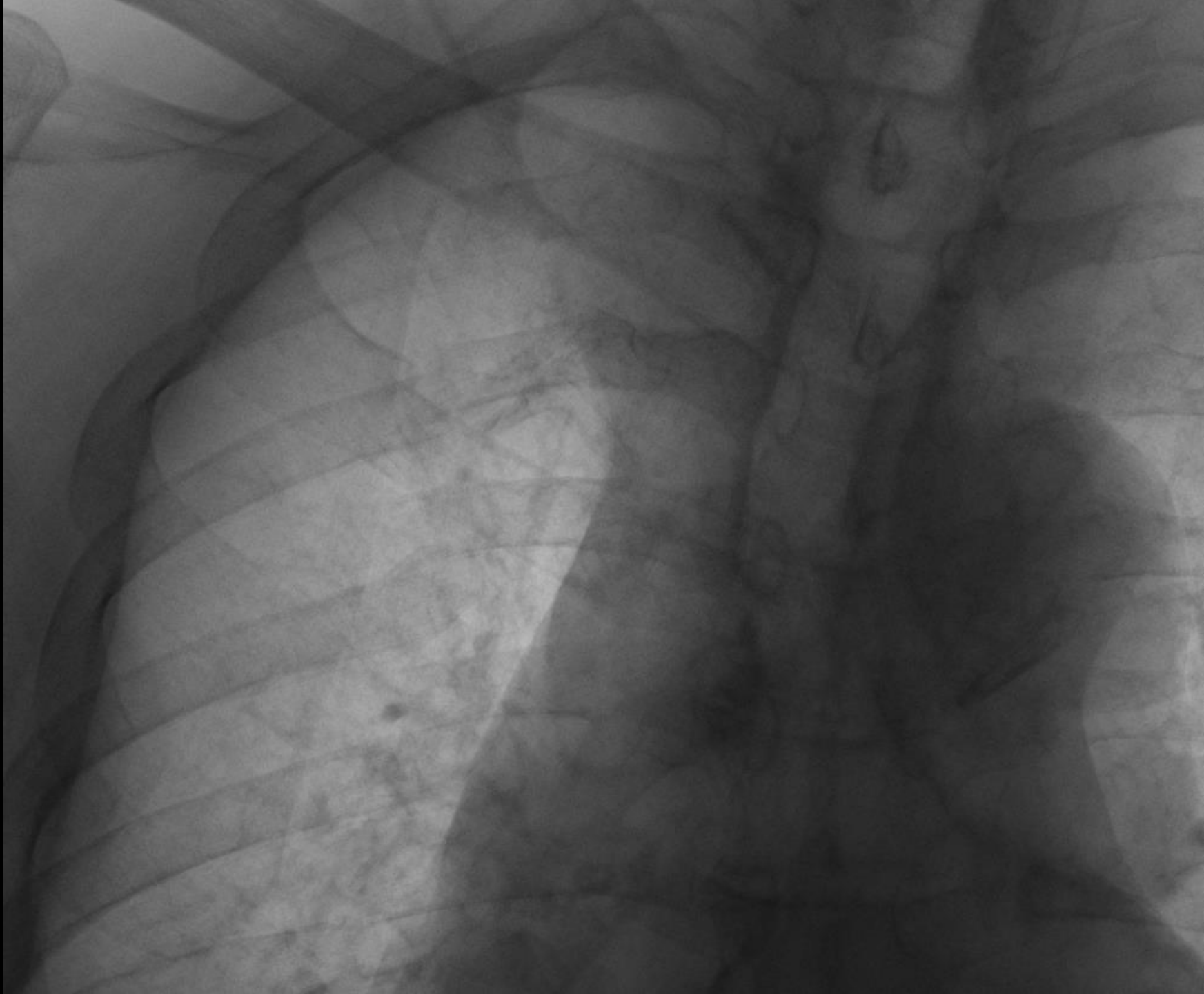
Bronchial foreign-body impaction

Foreign body obstruction — RLL post-obstructive consolidation

92 / M
46520702

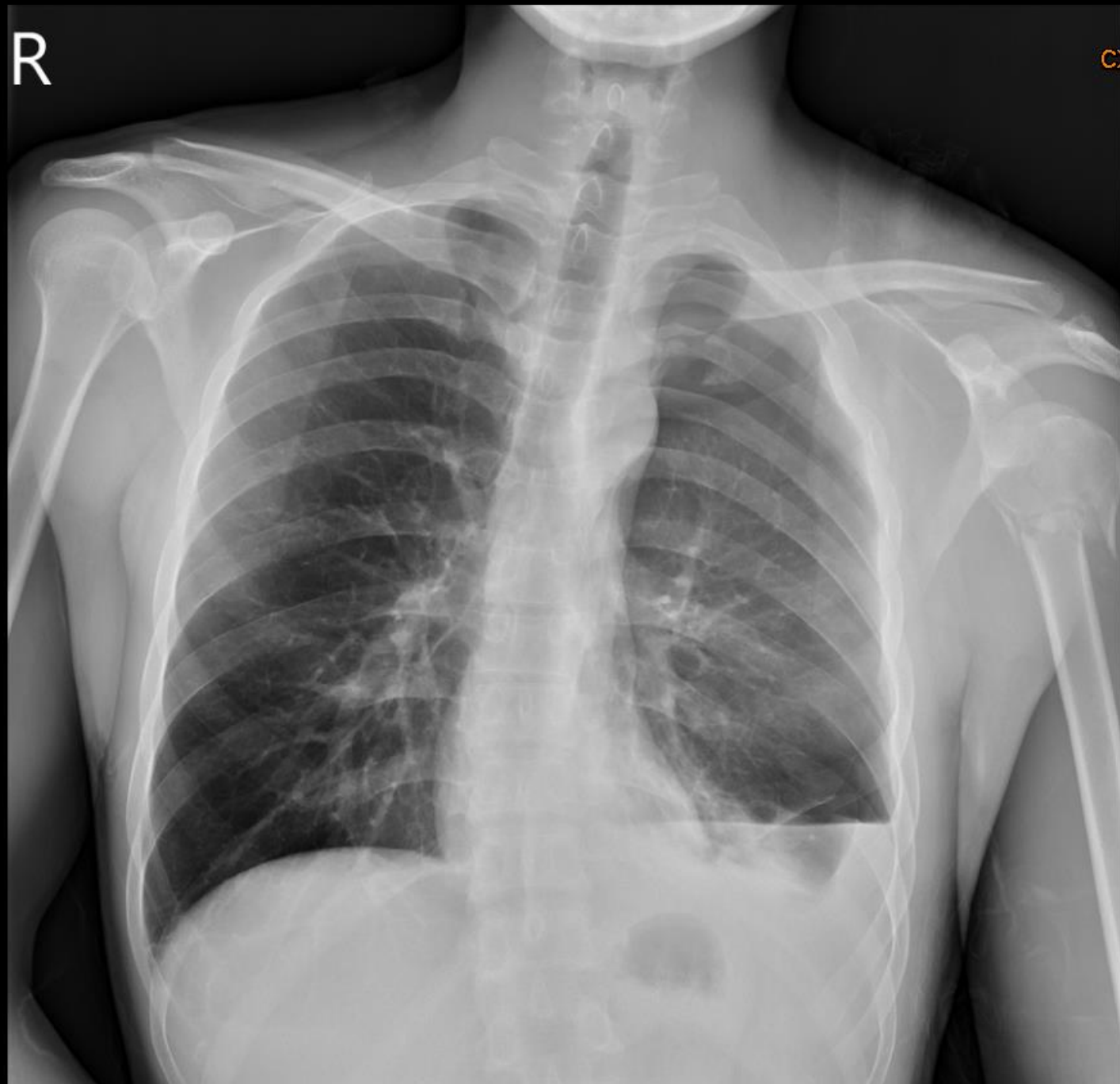
wheezing
breath
sounds for
1 week

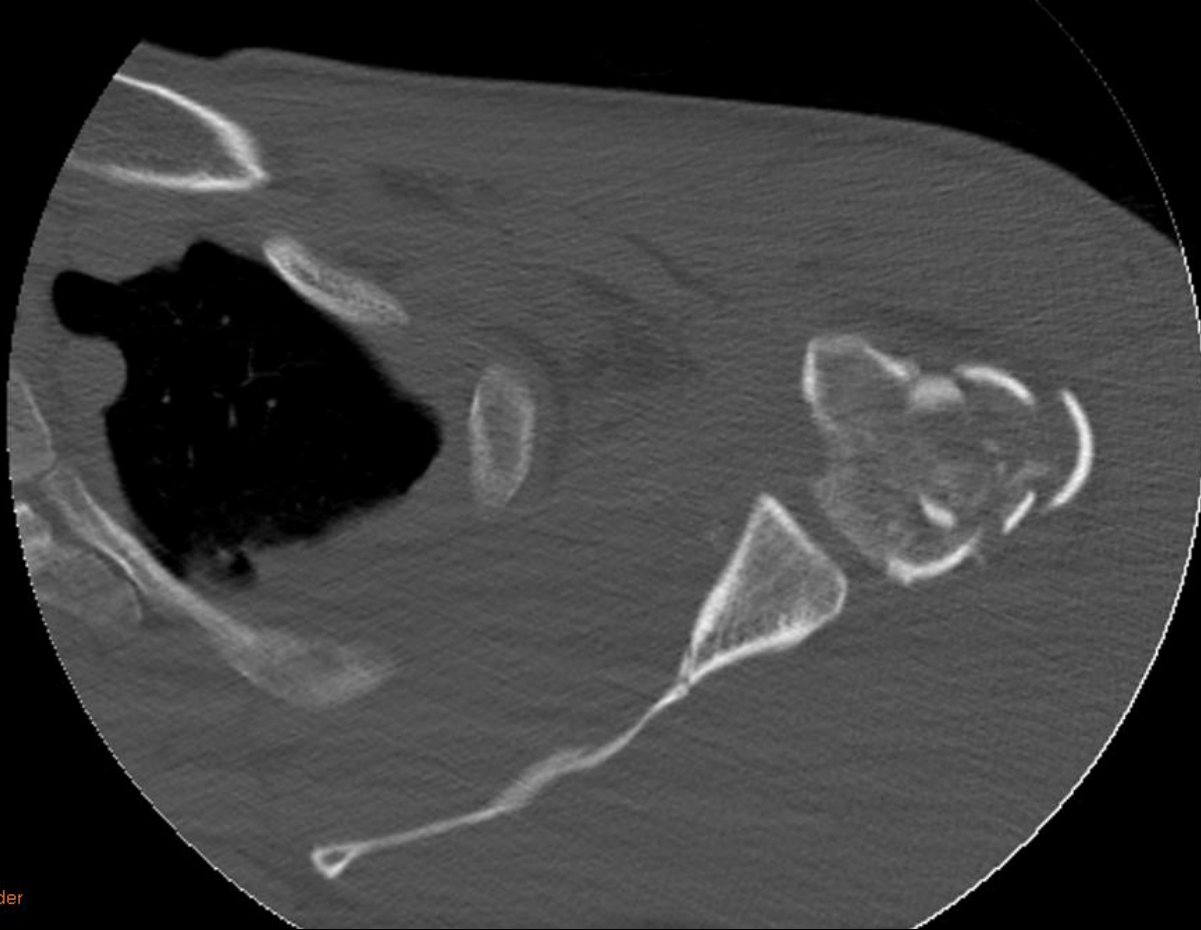




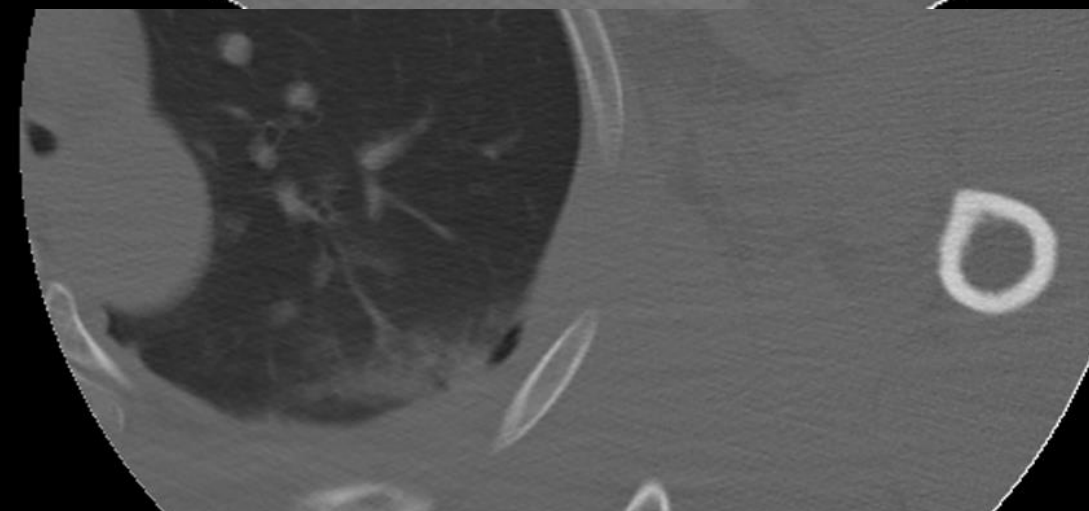
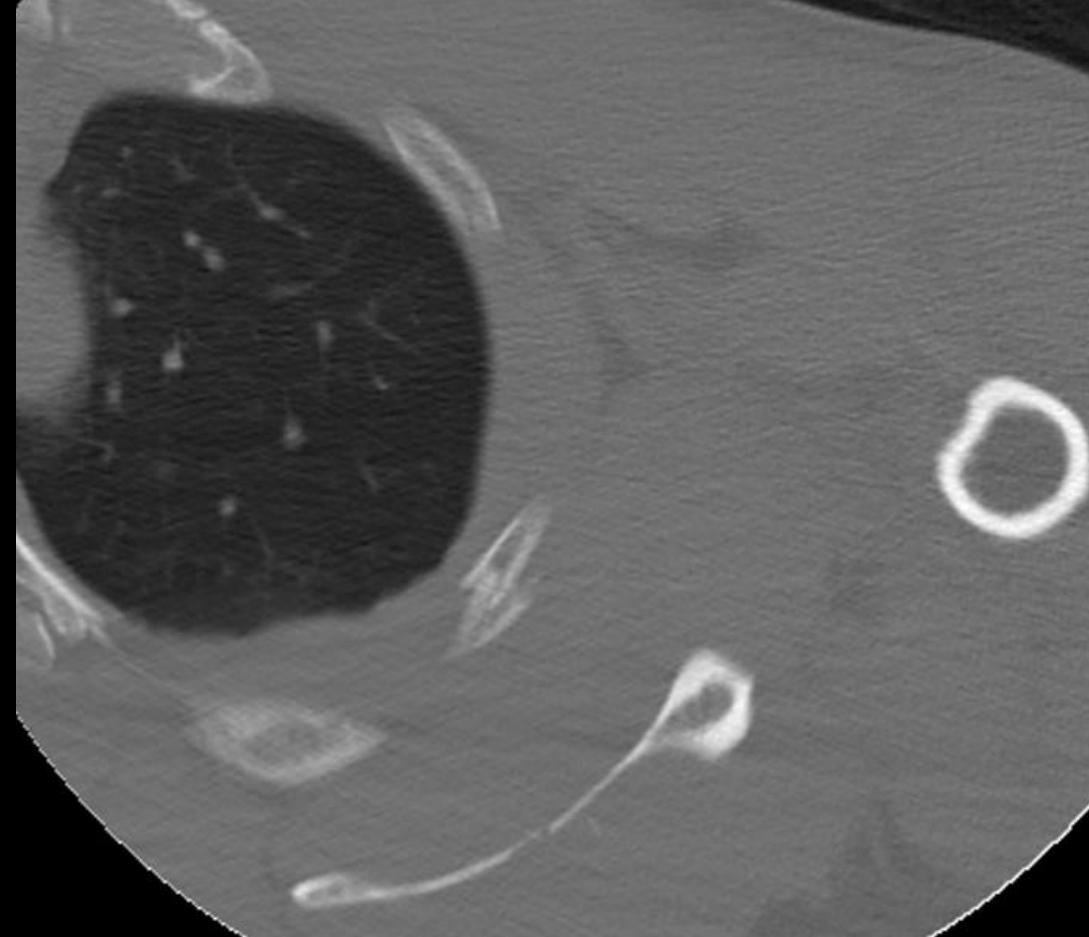
31 / M
46167826

Chest &
left arm
pain





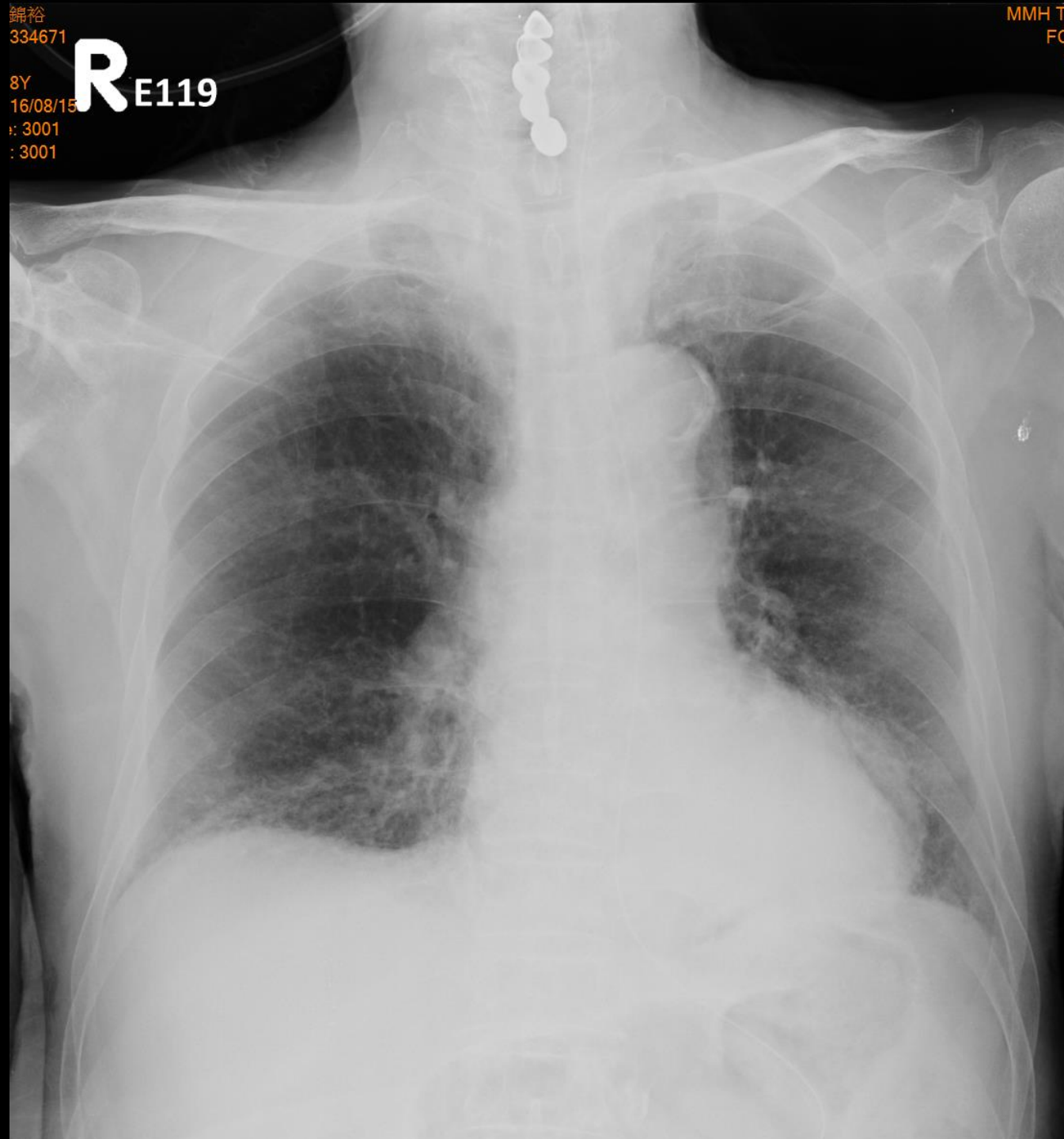
houlder



2 days ago
Left shoulder CT

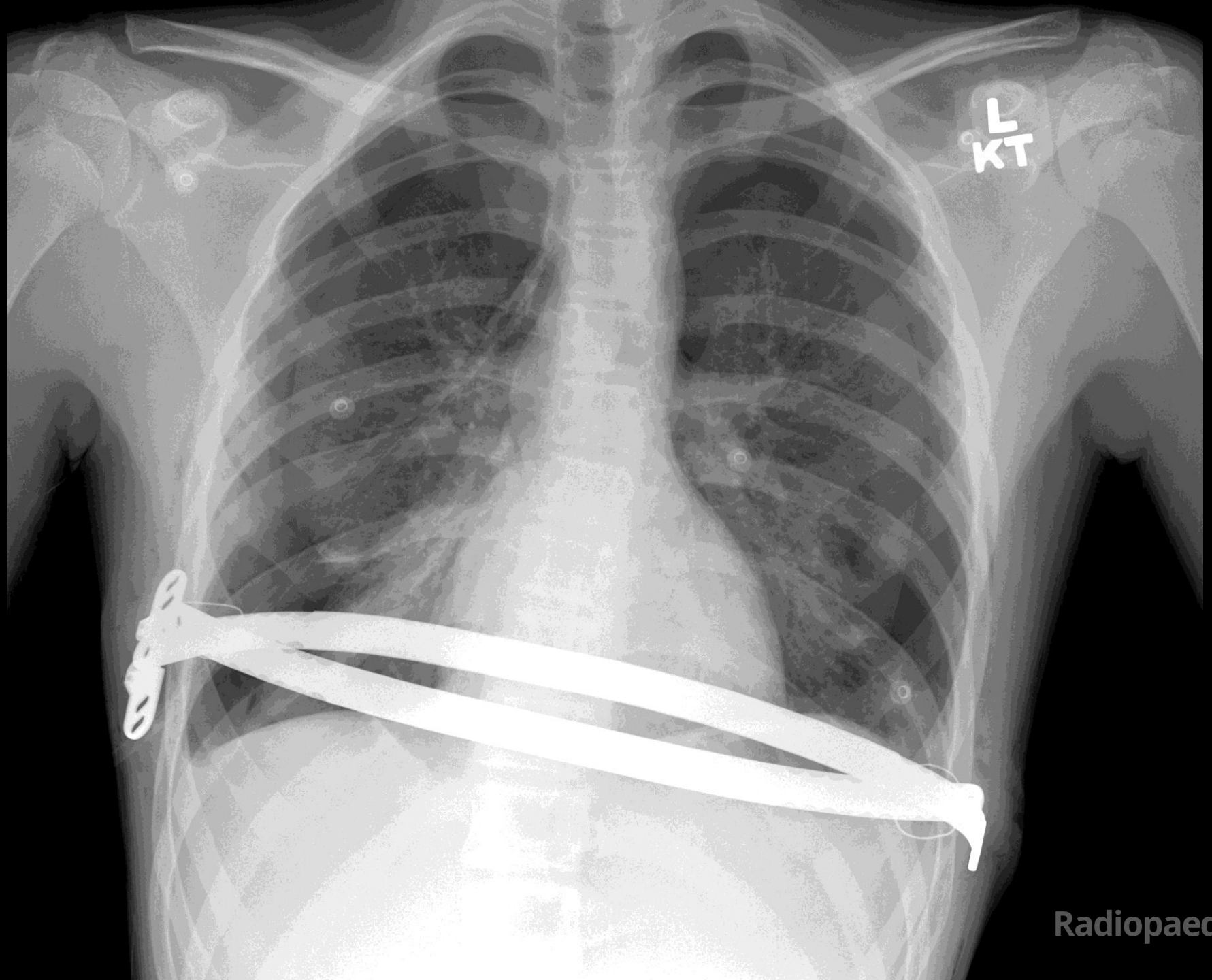
78 / M
31334671

Difficult
breathing





**Bilateral
pneumothorax
following a
Nuss
procedure**



Summary

重點統整

165 imaging questions reviewed across 5 years (2021–2025) — 27 critical-care cases identified after excluding infection/airway topics

- | | |
|---|-----------------------------------|
| 6 Catheter / Tube Malposition | 2 Septic Emboli |
| 5 Pneumothorax Family | 2 Pulmonary Embolism |
| 4 Pneumomediastinum | 2 Trauma |
| 3 Esophageal Perf. / Mediastinitis | 1 Free Air |
| 3 Cardiogenic Edema / CHF | 1 Foreign Body Obstruction |

Highest-yield teaching focus: line/tube malposition → pneumothorax family → pneumomediastinum

複習重點建議：導管管路異常→氣胸家族→縱隔氣腫，三者共作最高頻

Exam Strategy

應考心法

- 1 閱讀題目敘述，快速圈出關鍵字
- 2 有 CT 影像，先看 CT 再作答
- 3 每個看到的管路都要描述，留心異物
- 4 看到皮下氣腫，馬上檢查是否合併氣胸家族（單或雙側）、縱膈腔氣腫
- 5 肋膜積水要特別注意：外傷（骨折？）或懷疑腫瘤（骨轉移？）