115 年影像判讀繼續教育課程
急重症影像判讀

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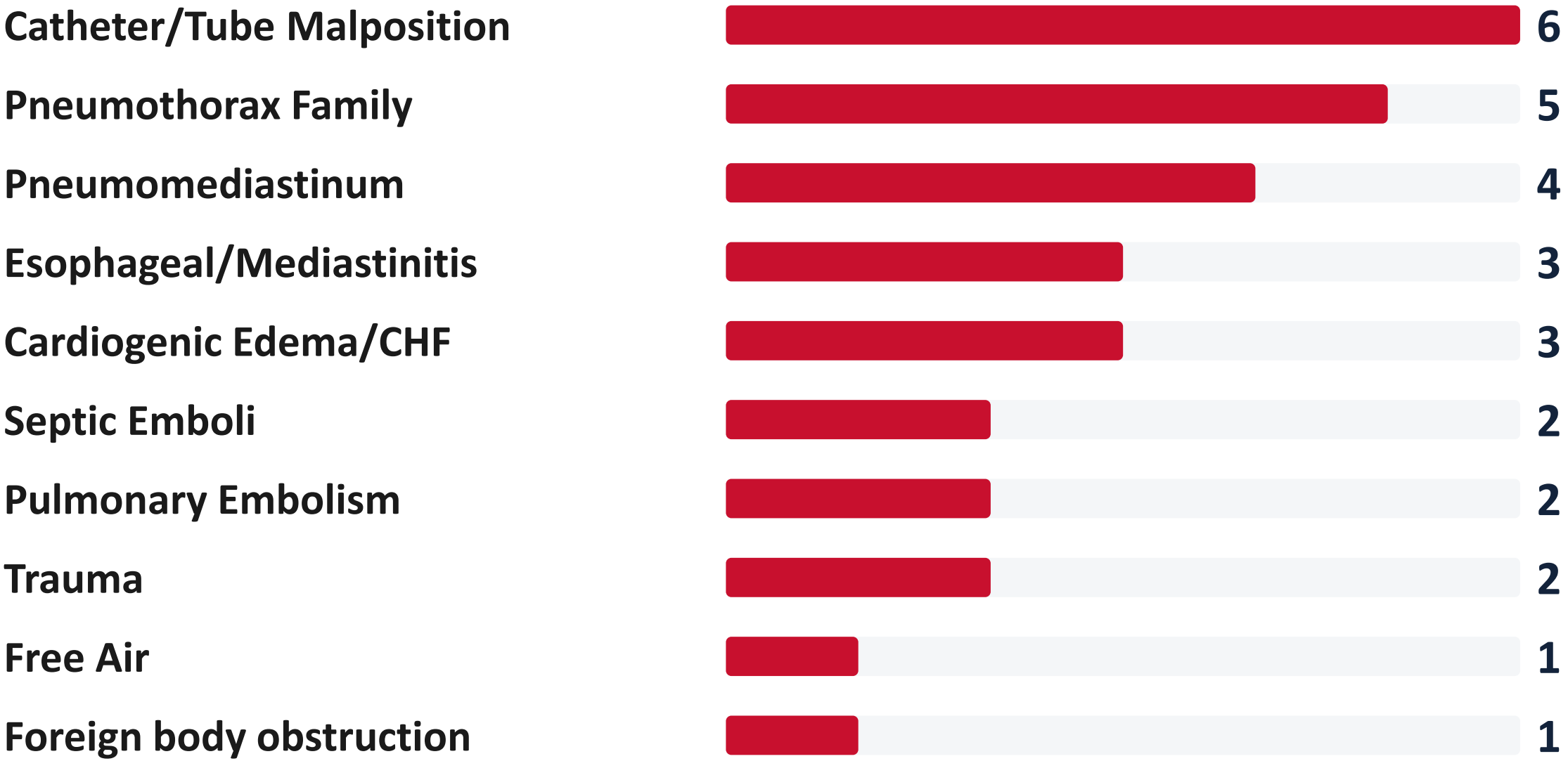
鍾心珮 醫師

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.

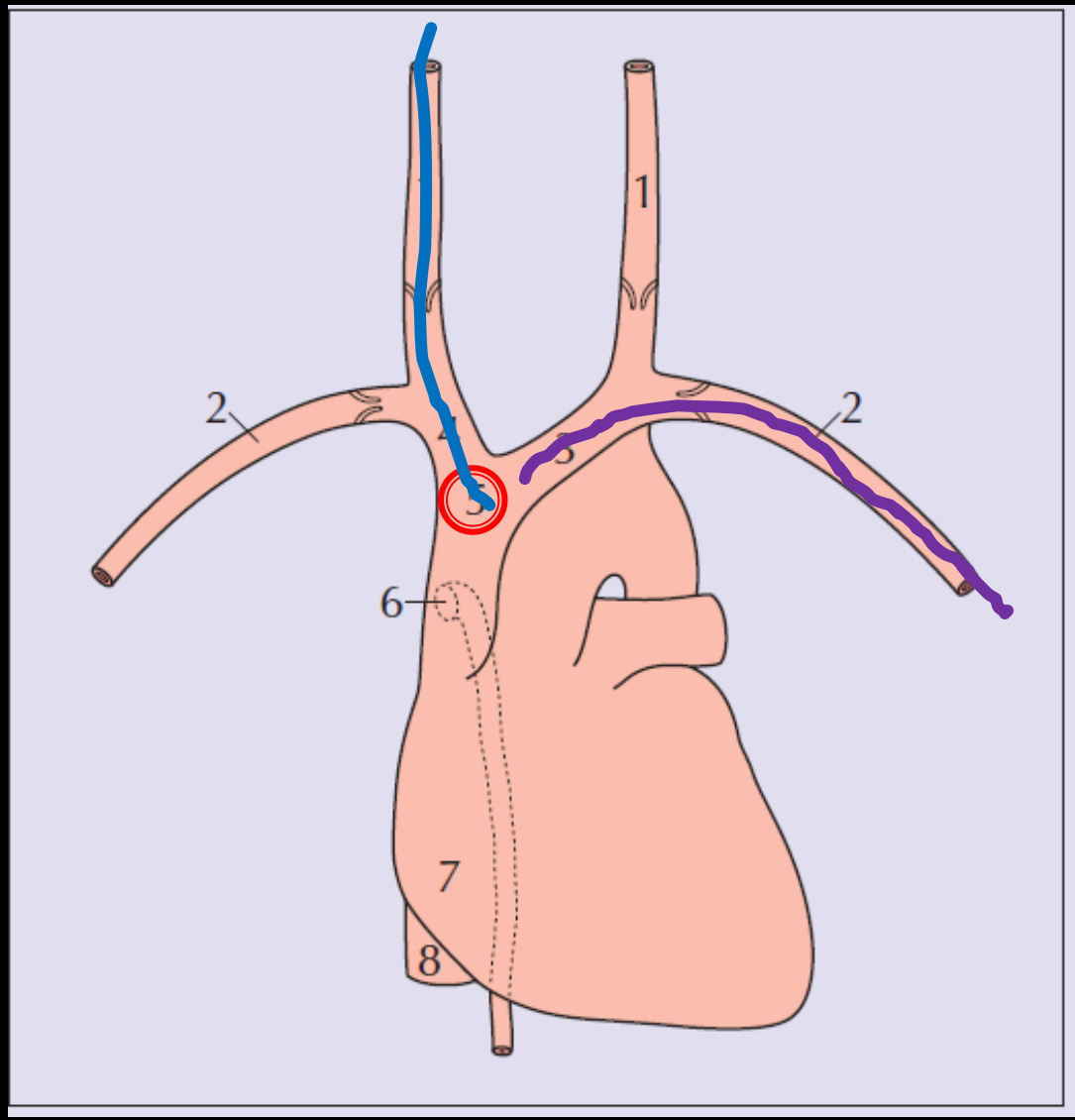
Line, tube, wire	Purpose / function	Best position for the tip
Central venous pressure line	■ Monitoring right atrial pressure ■ Fluid infusion / nutrition ■ Drug administration	Superior vena cava or brachiocephalic vein
Swan–Ganz catheter (Pulmonary arterial catheter)	■ Monitoring pulmonary arterial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



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.*

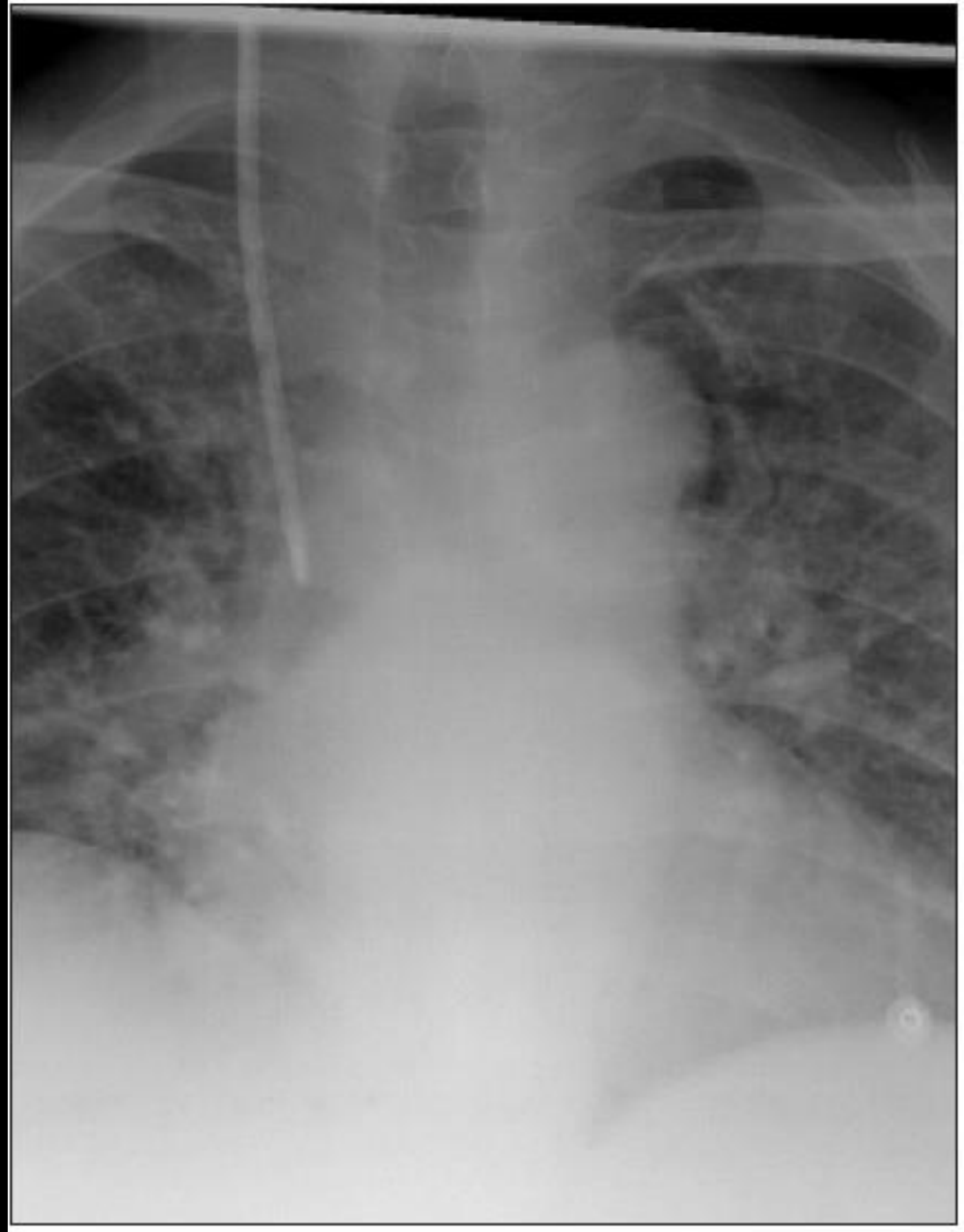
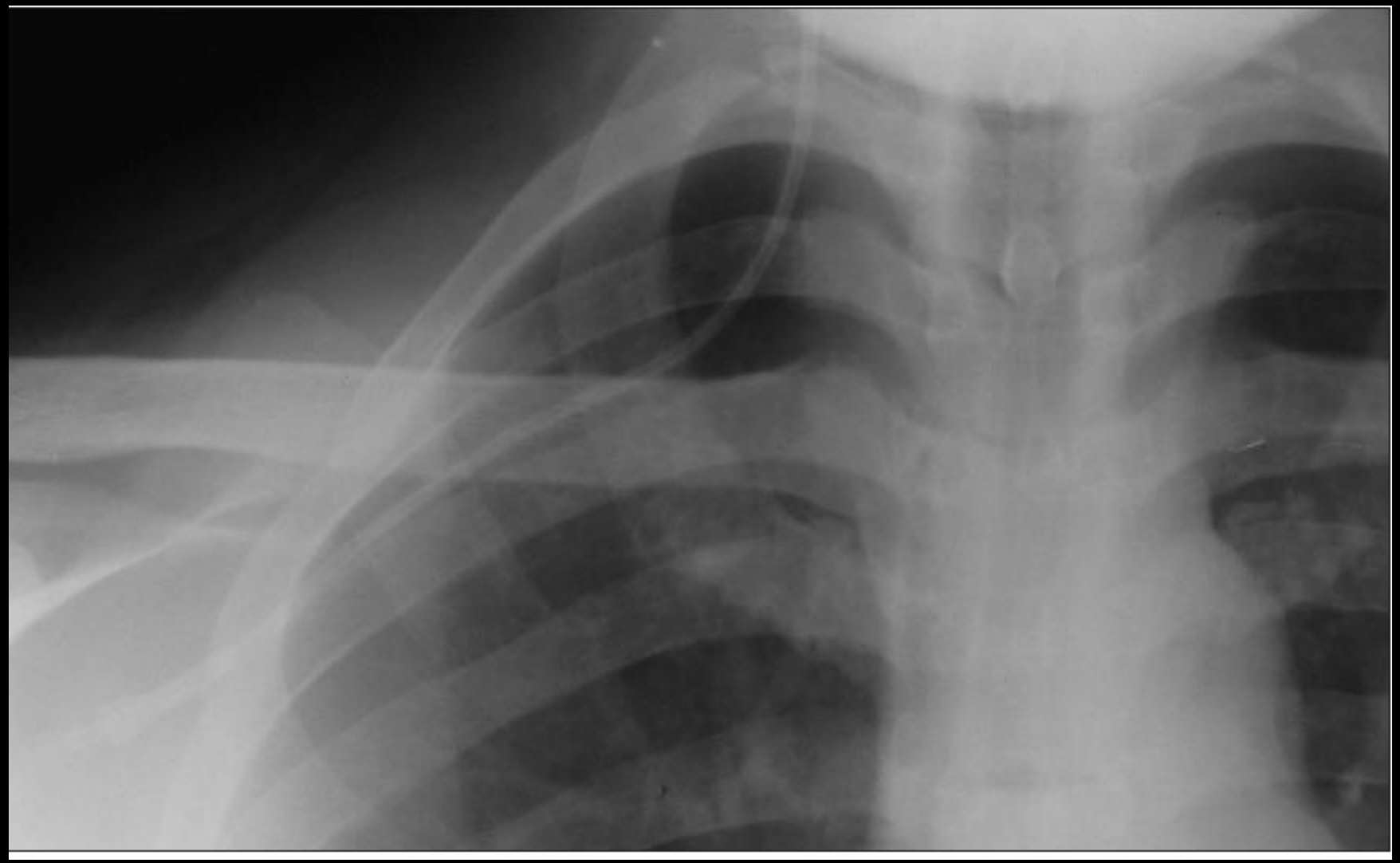


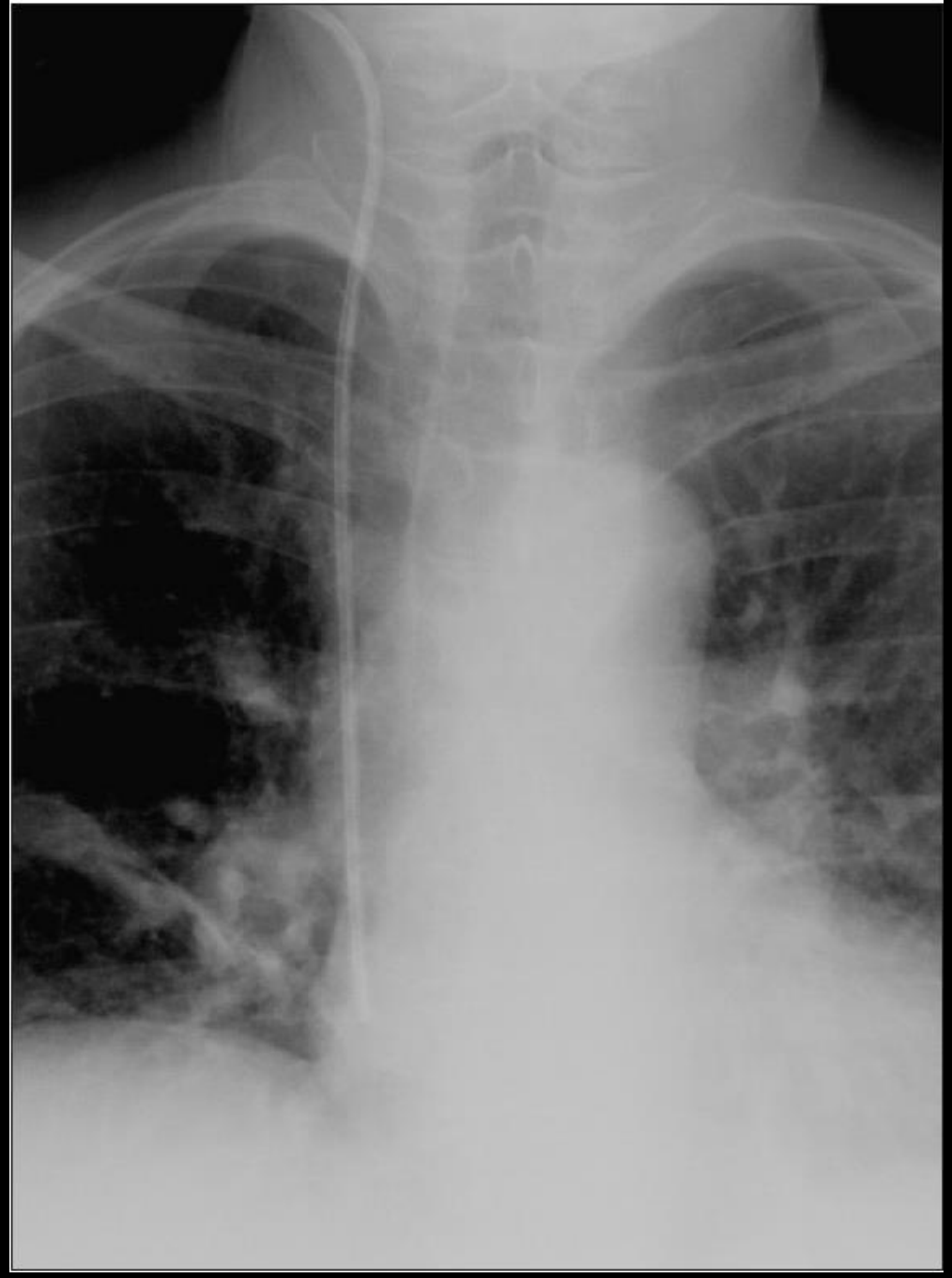
Figure 13.5 *Right internal jugular line in good position. (Retouched.)*

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

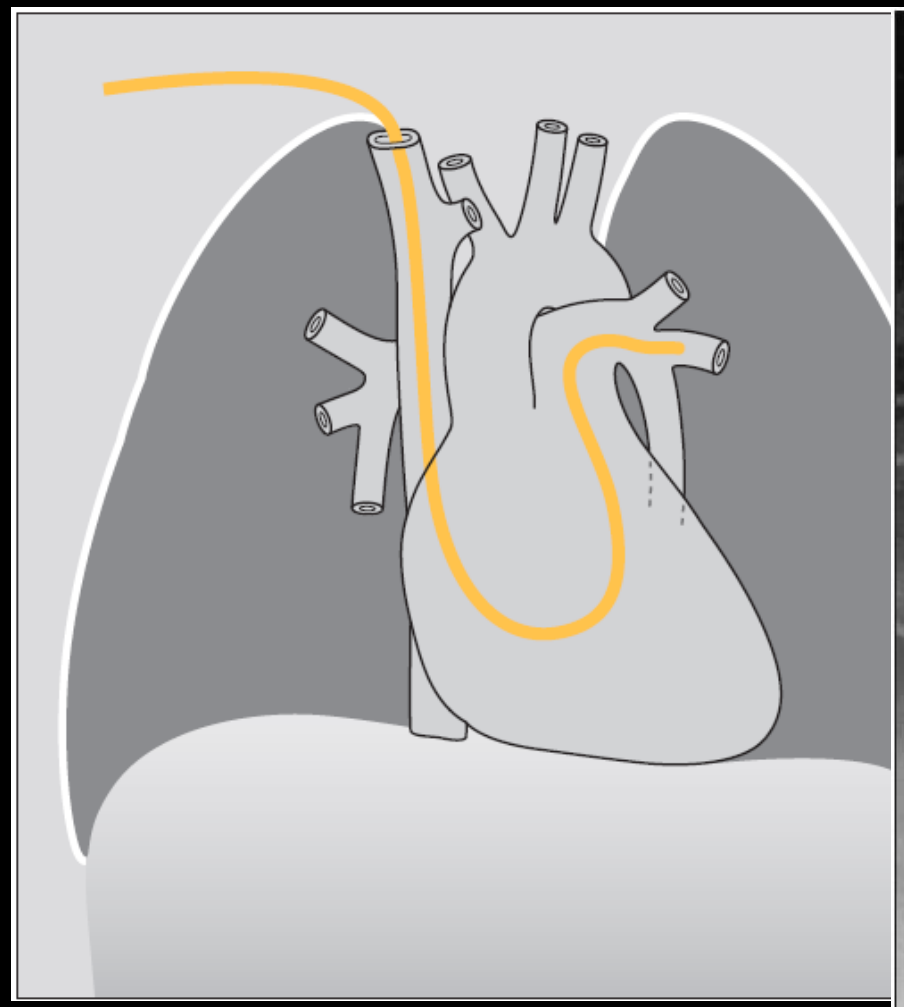


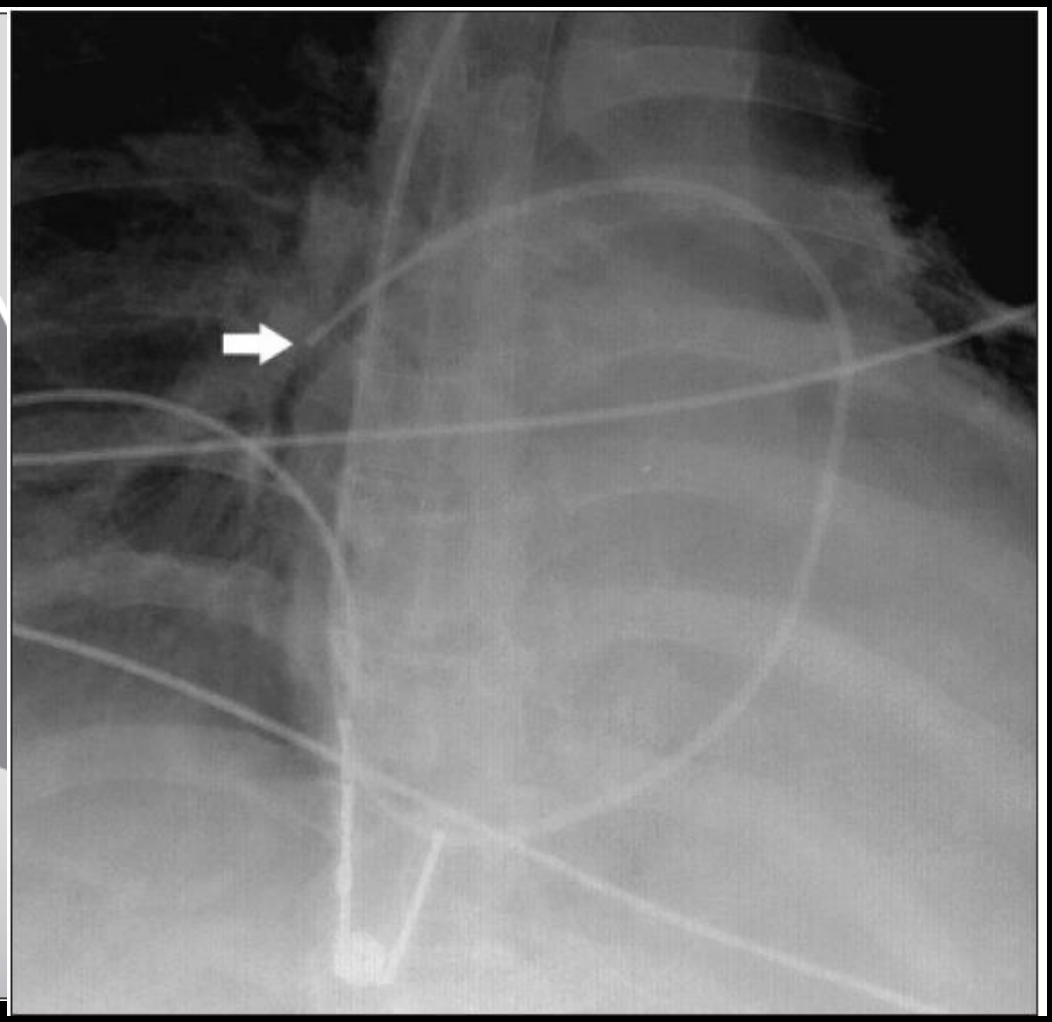
Malposition



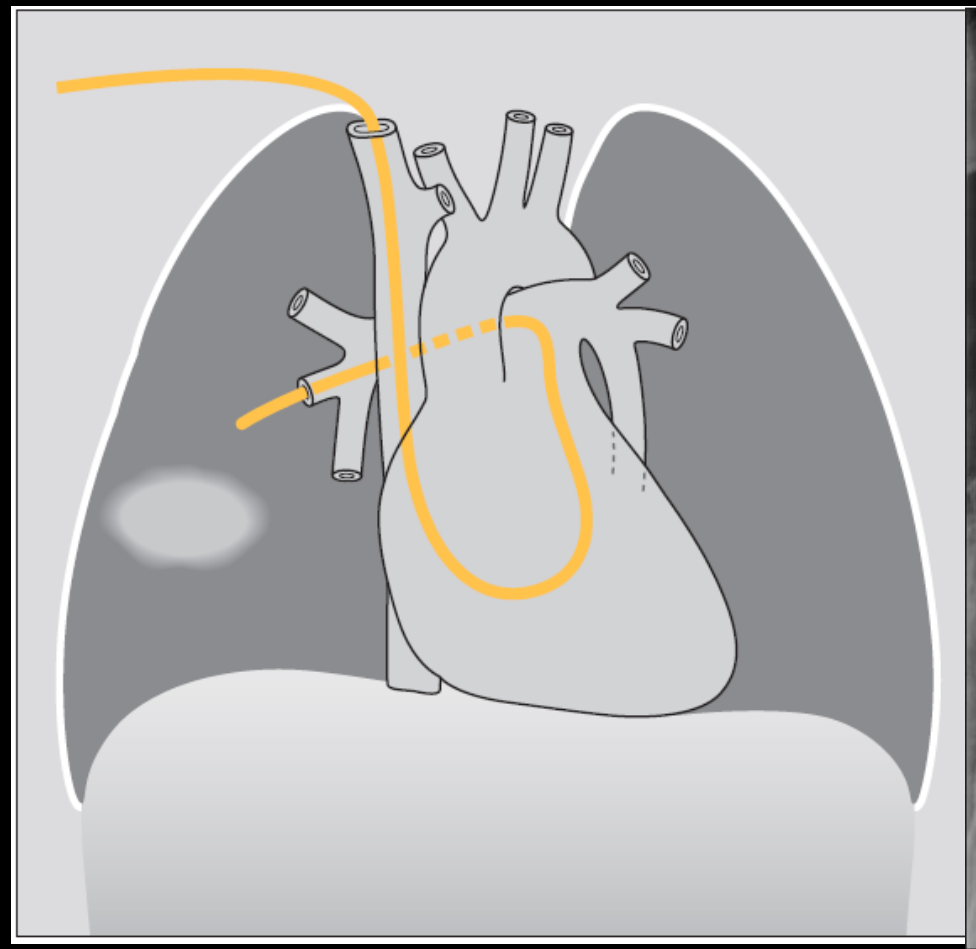
Swan-Ganz Catheter

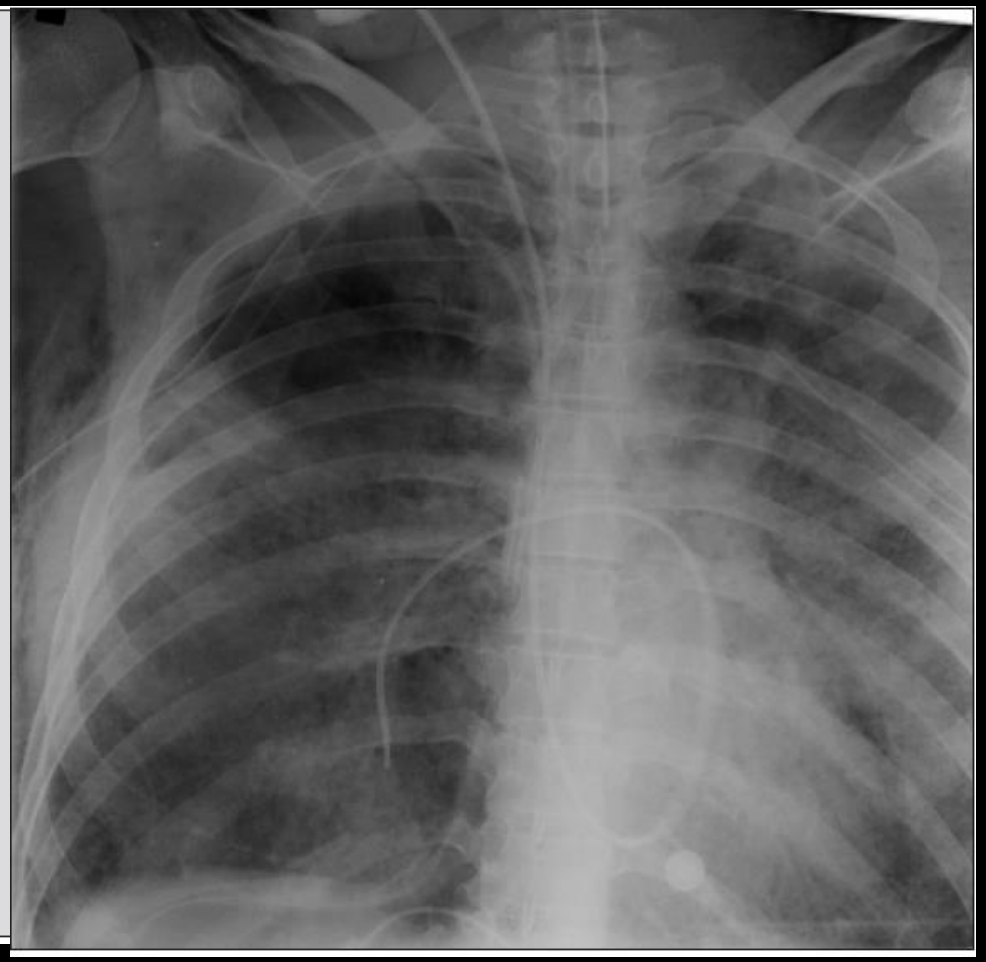
The tip overlies the border of the heart





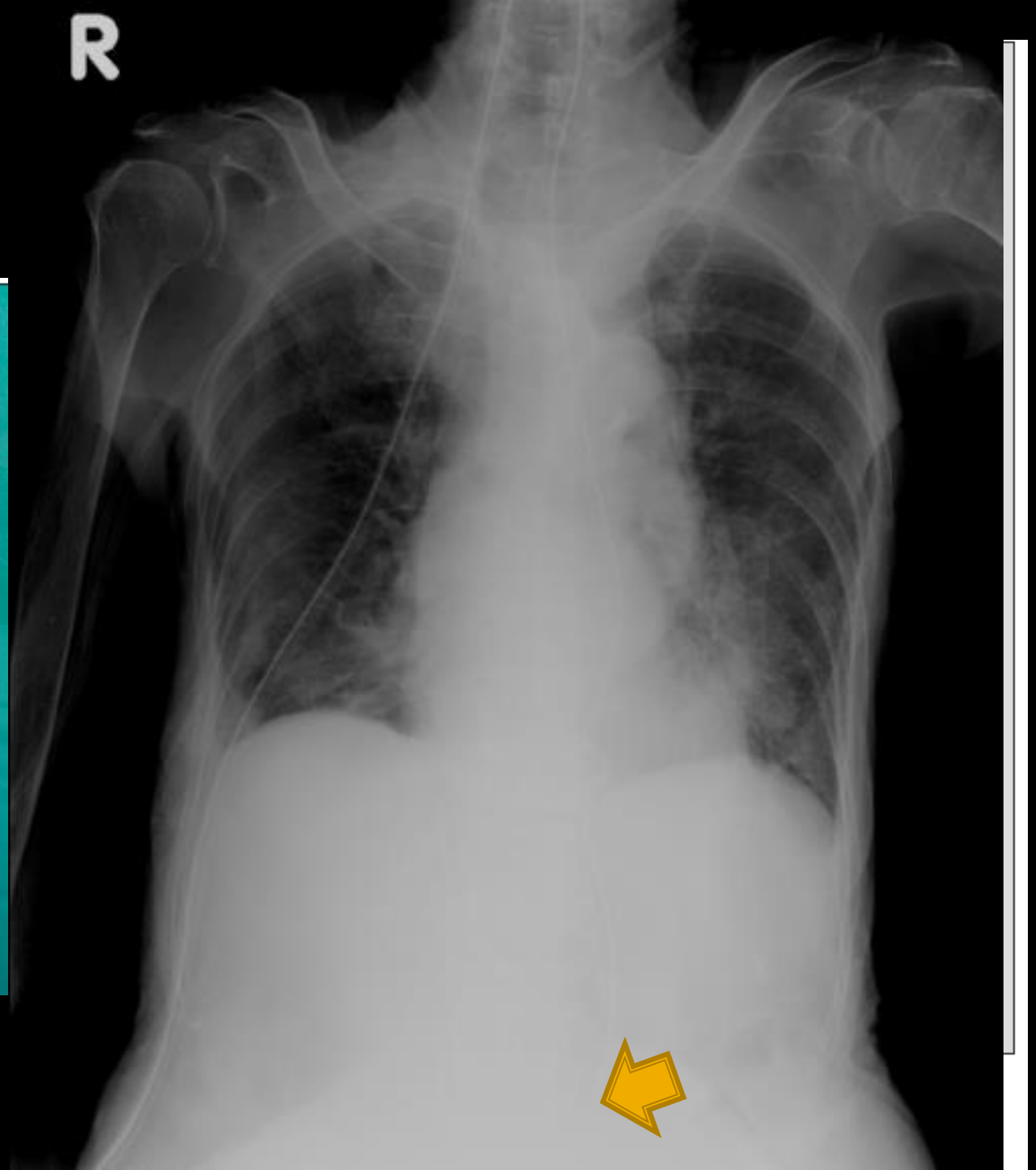
The Tip Beyond the Mediastinum



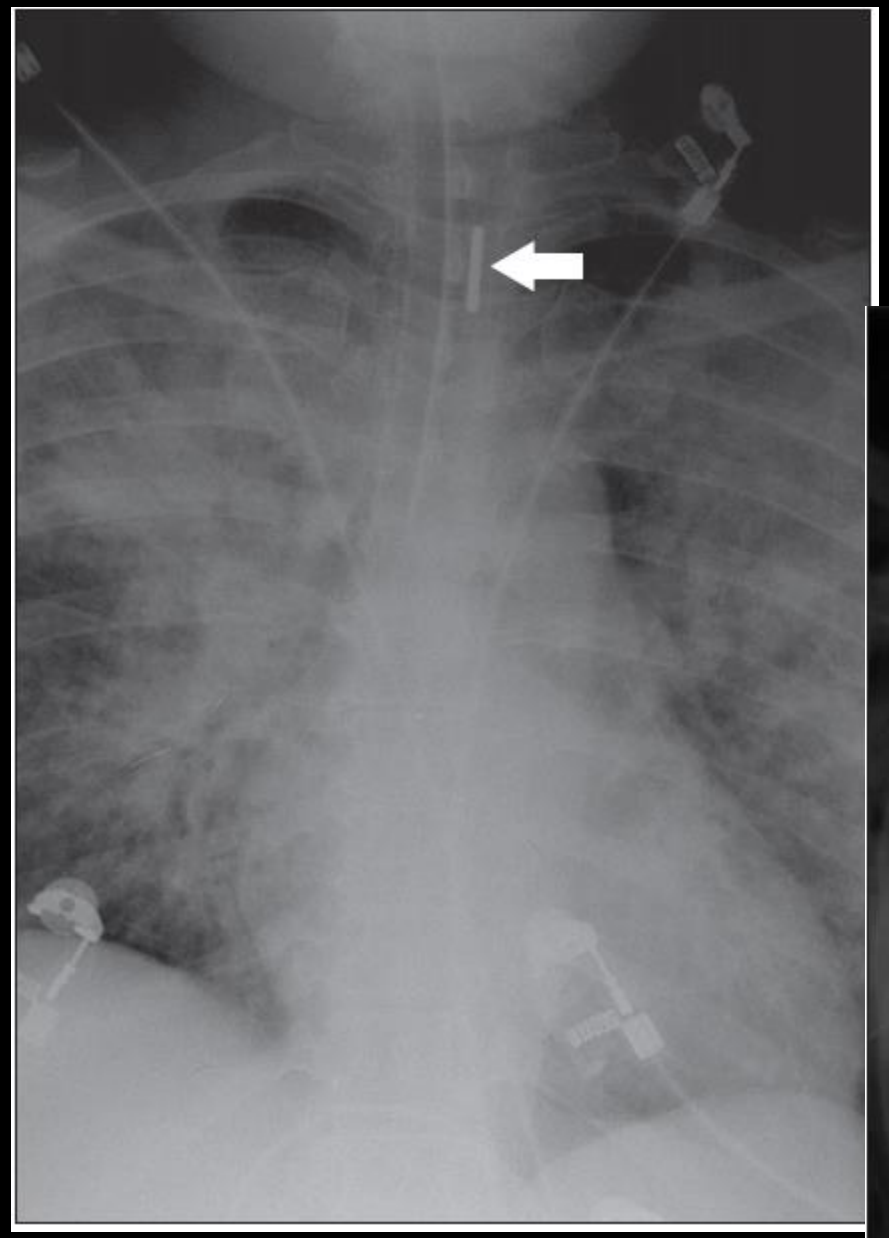


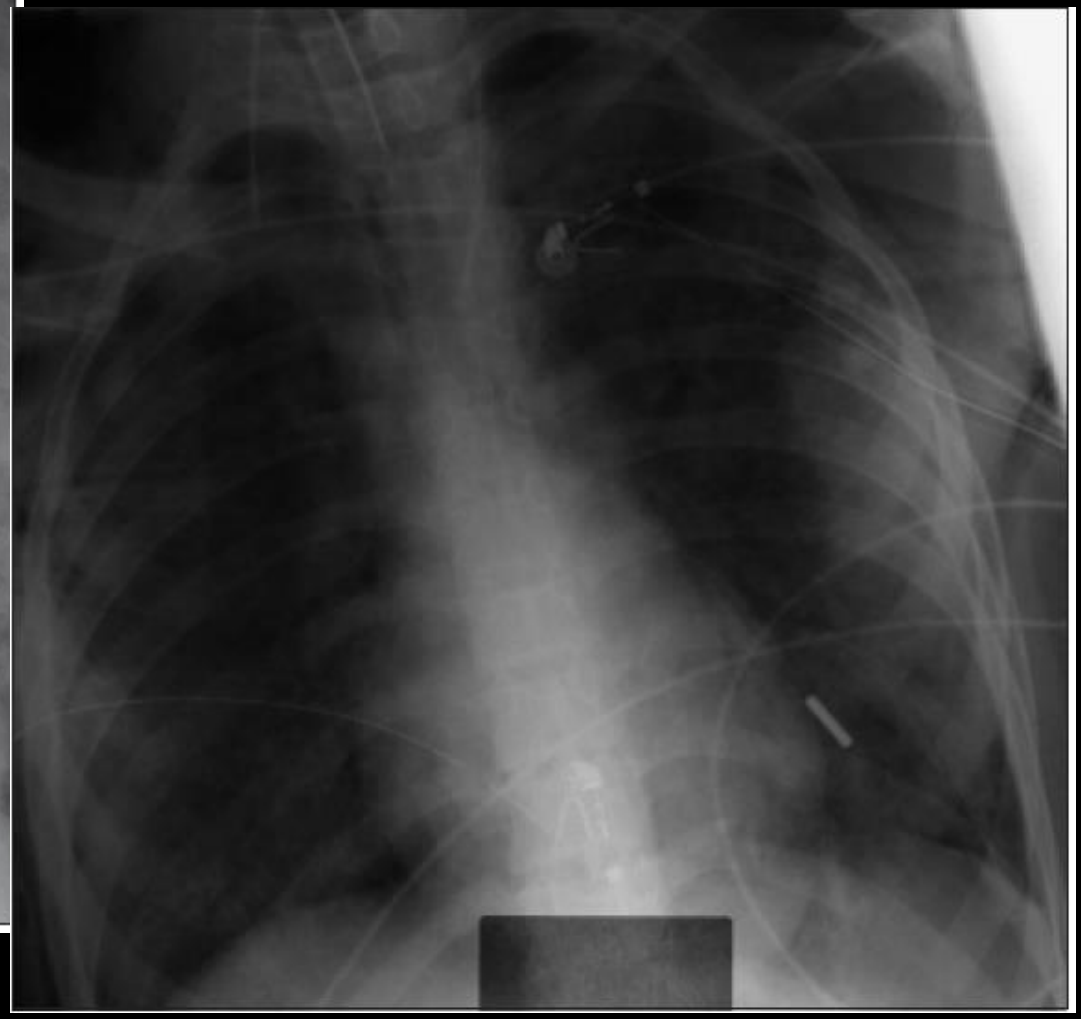
NG Tubes

10 cm



Malposition



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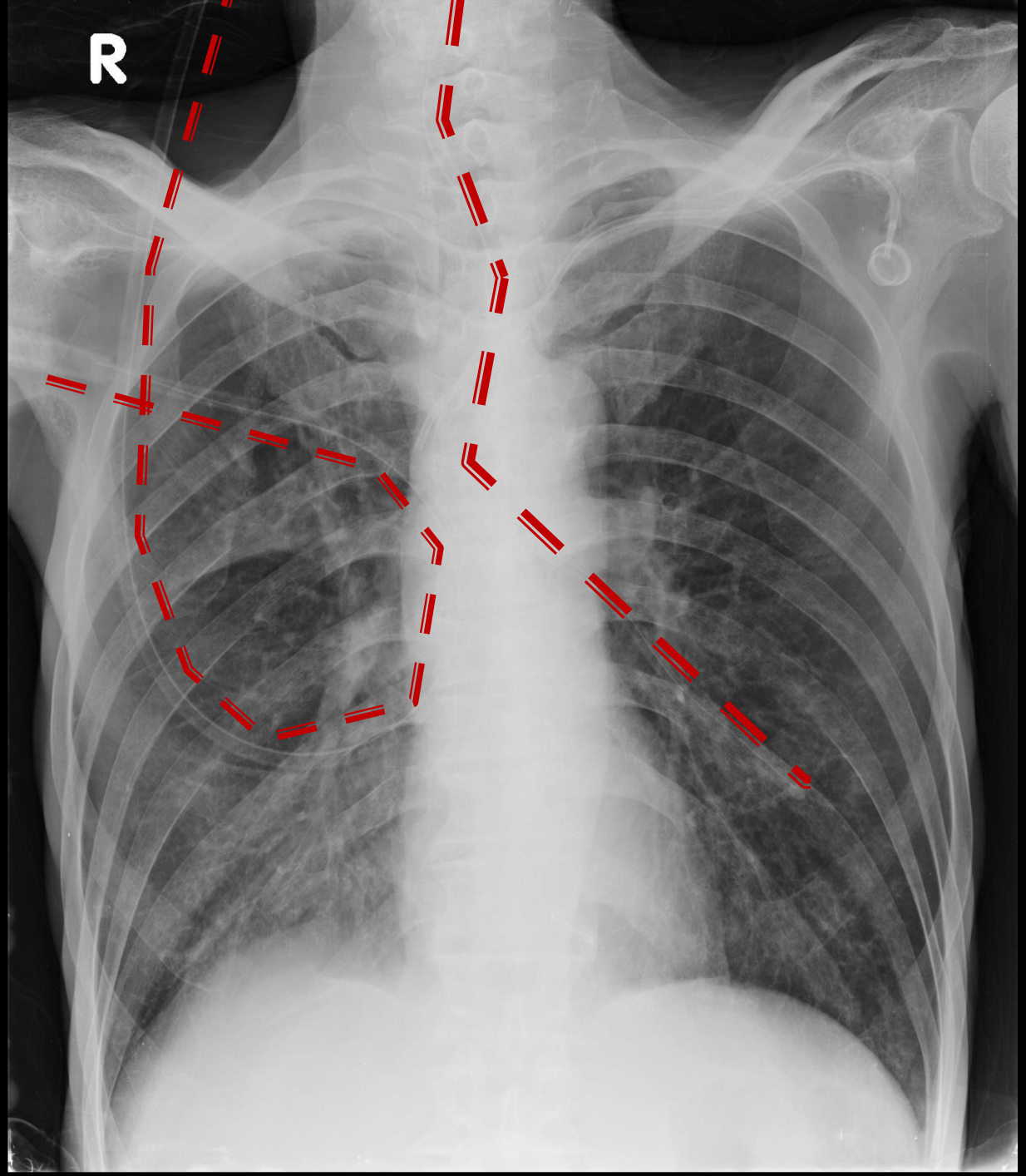
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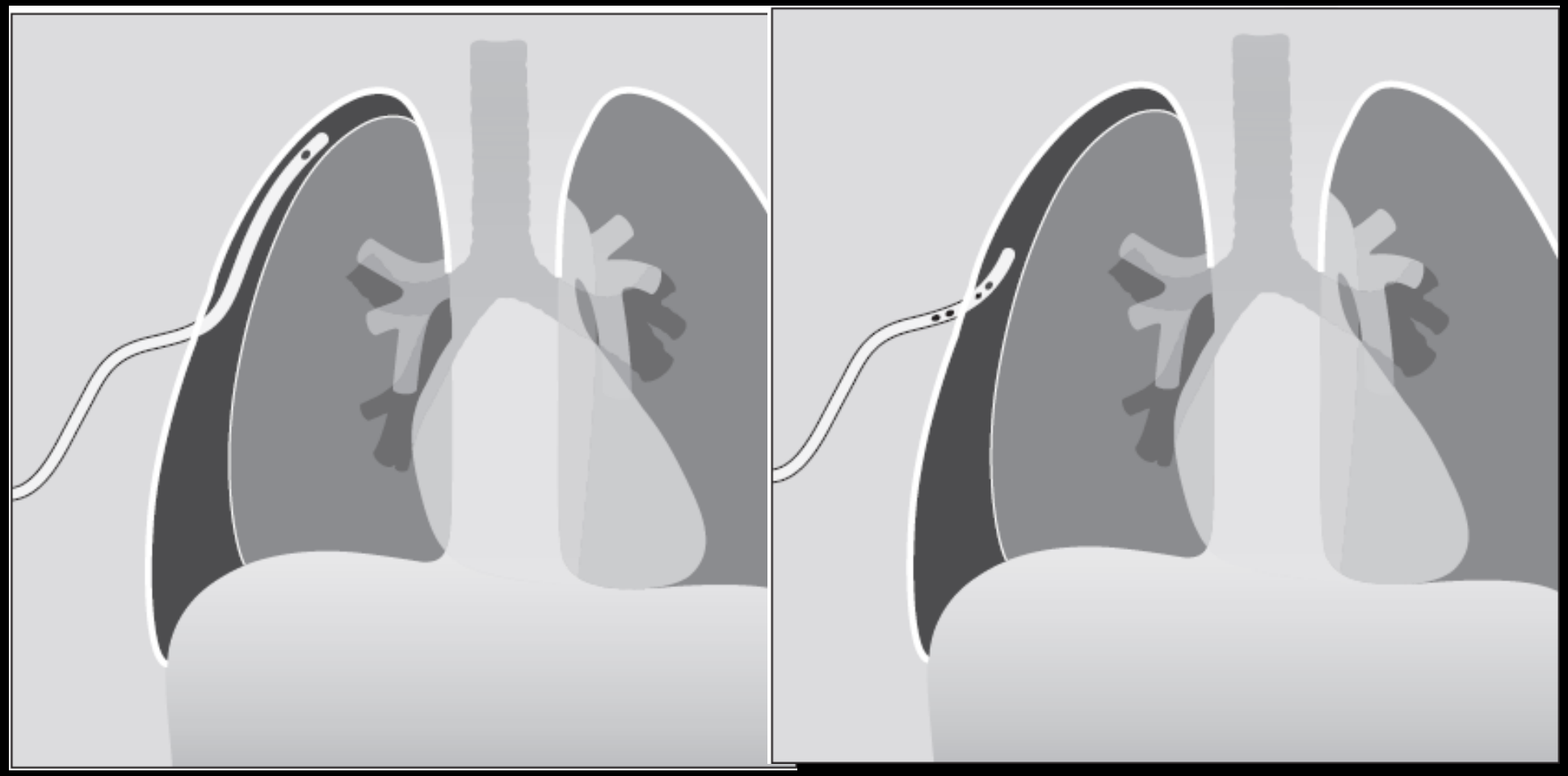
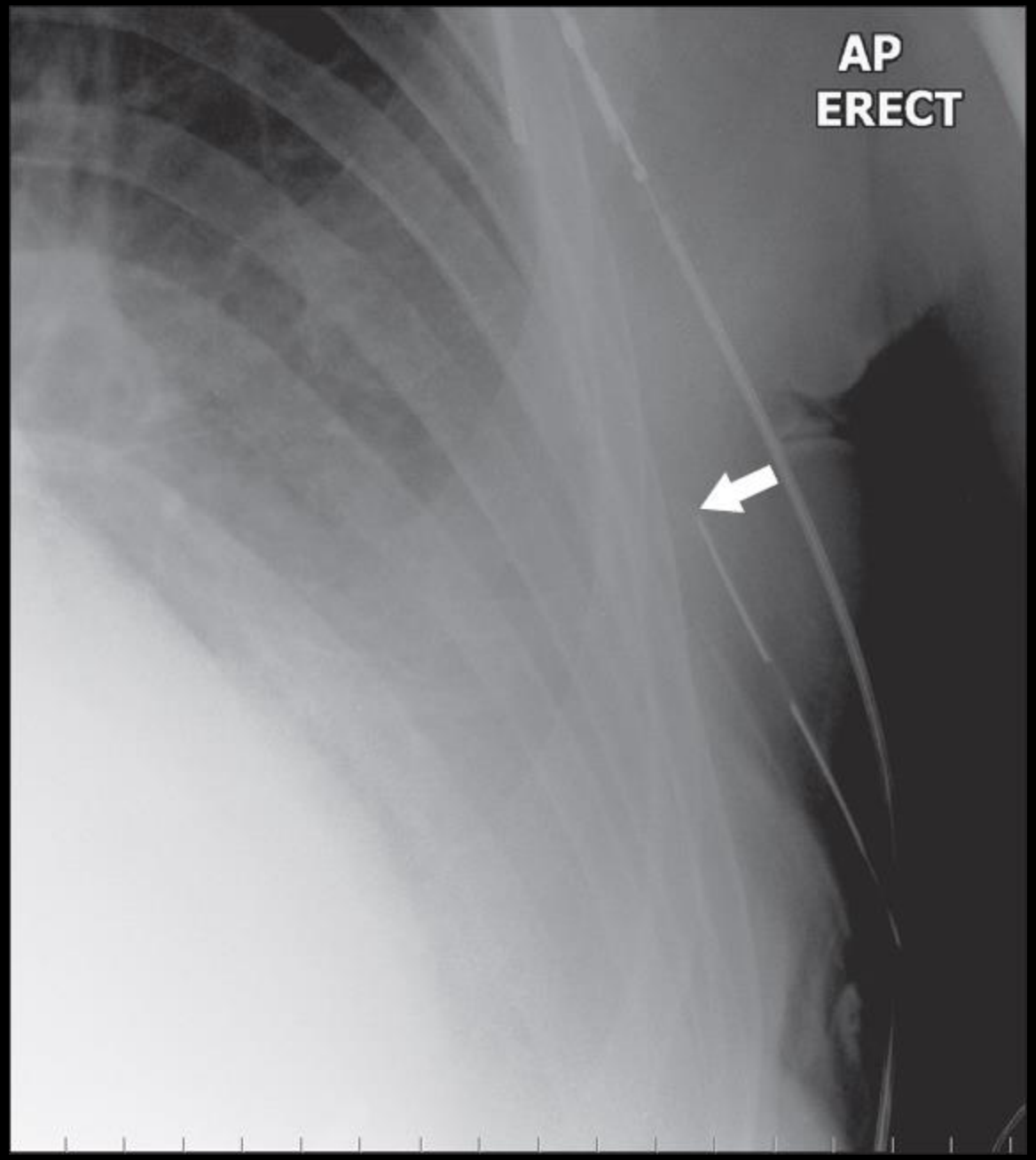
Chest Tubes



Pneumothorax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Endotracheal tube

- 5-7 cm to carina

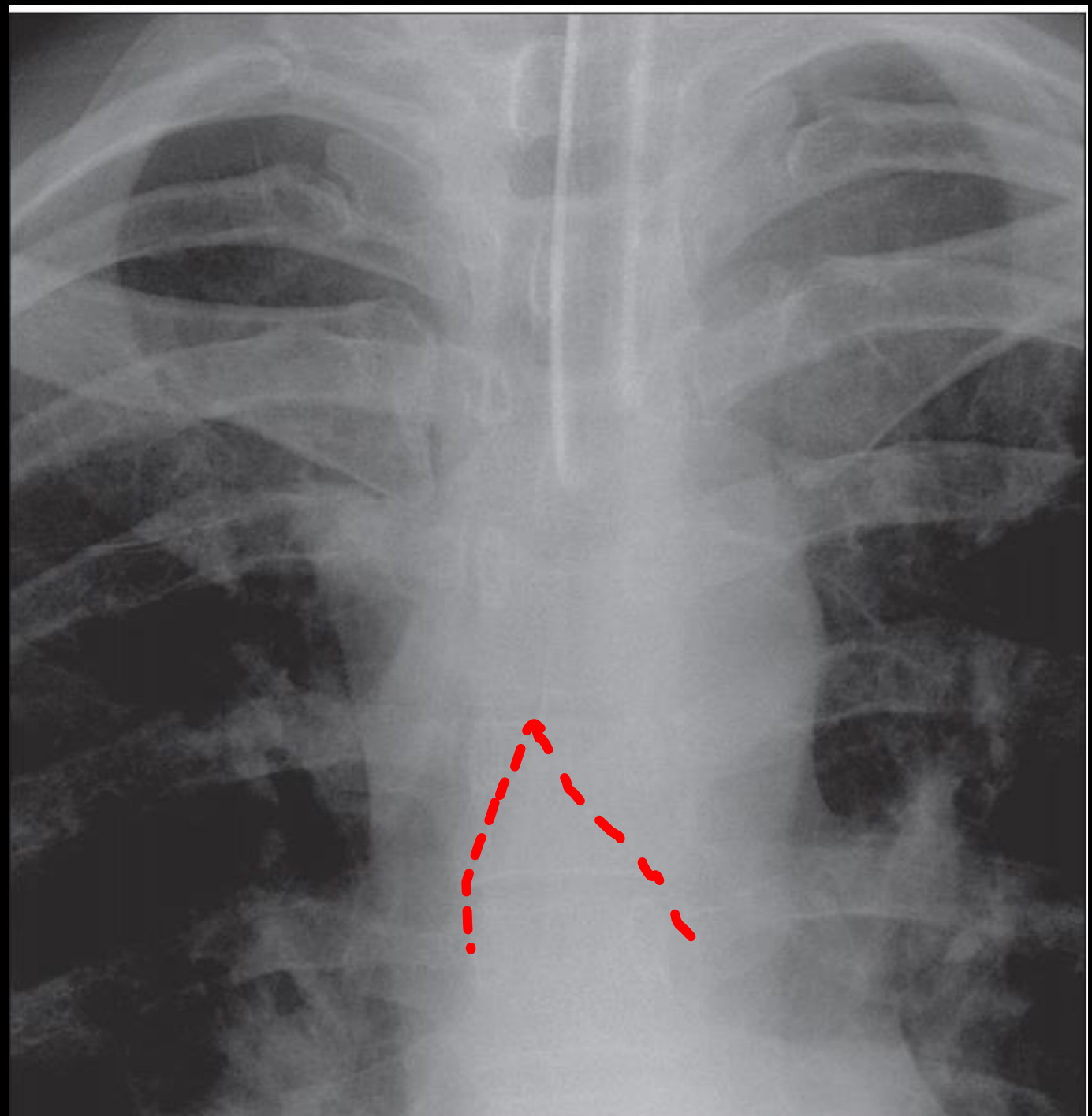
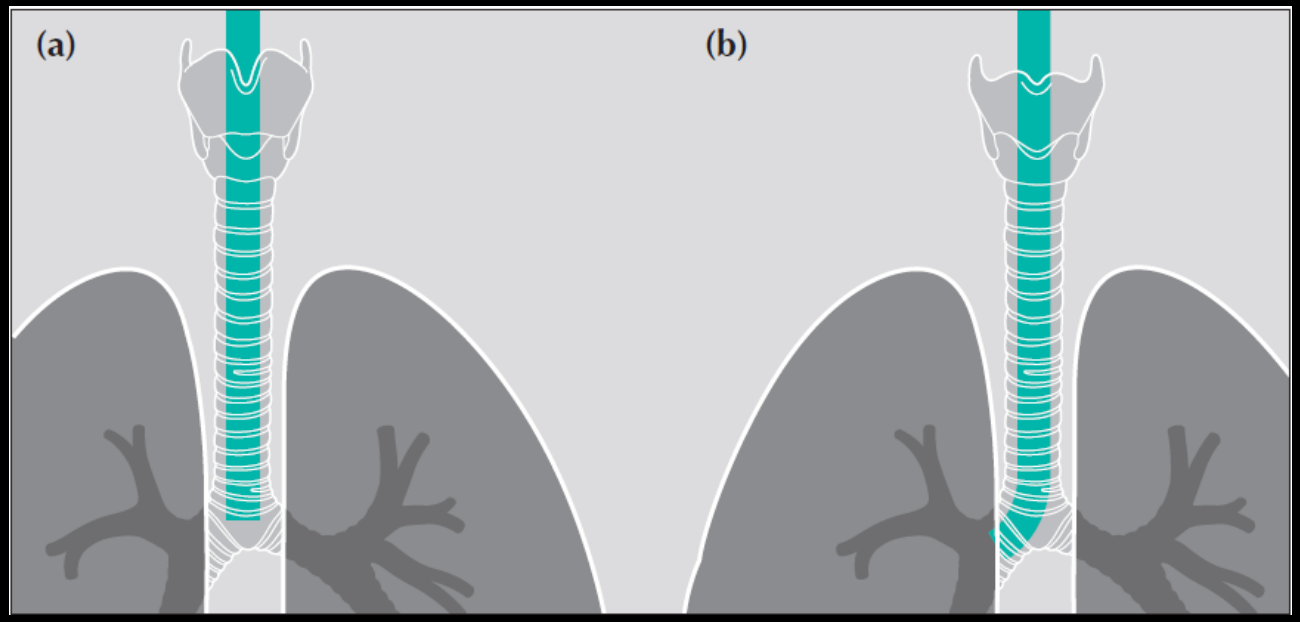
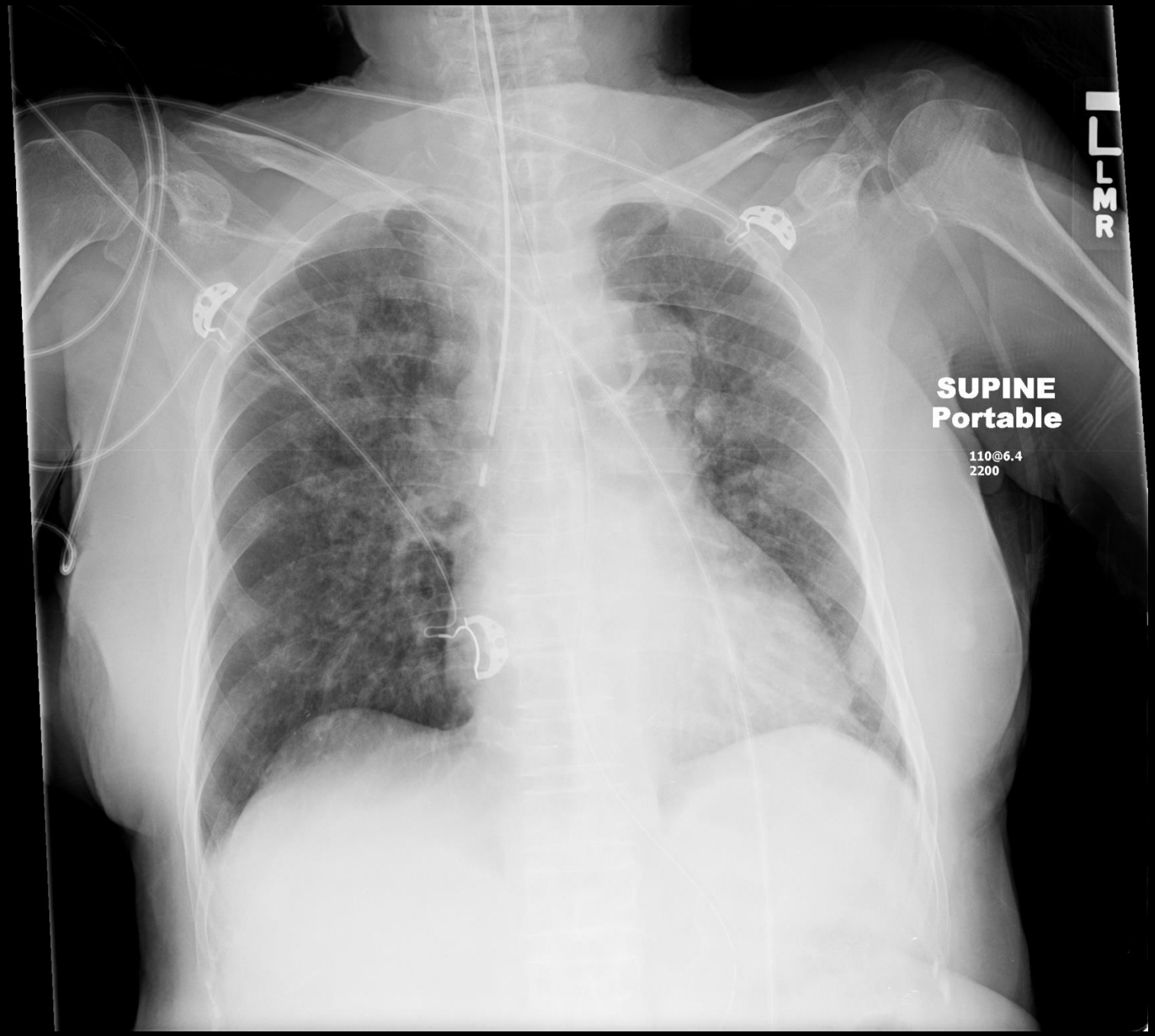


Table 13.2 ETT problems.

ETT malposition 1	ETT malposition 2
Tip in the right main bronchus. May cause:	Tube in the oesophagus. CXR evidence:
■ Left lung collapse	■ ETT lateral to the tracheal air shadow
■ And/or: right upper lobe collapse	■ Oesophagus distended with air
■ Or: right lung over-distension and pneumothorax.	■ Stomach distended with air

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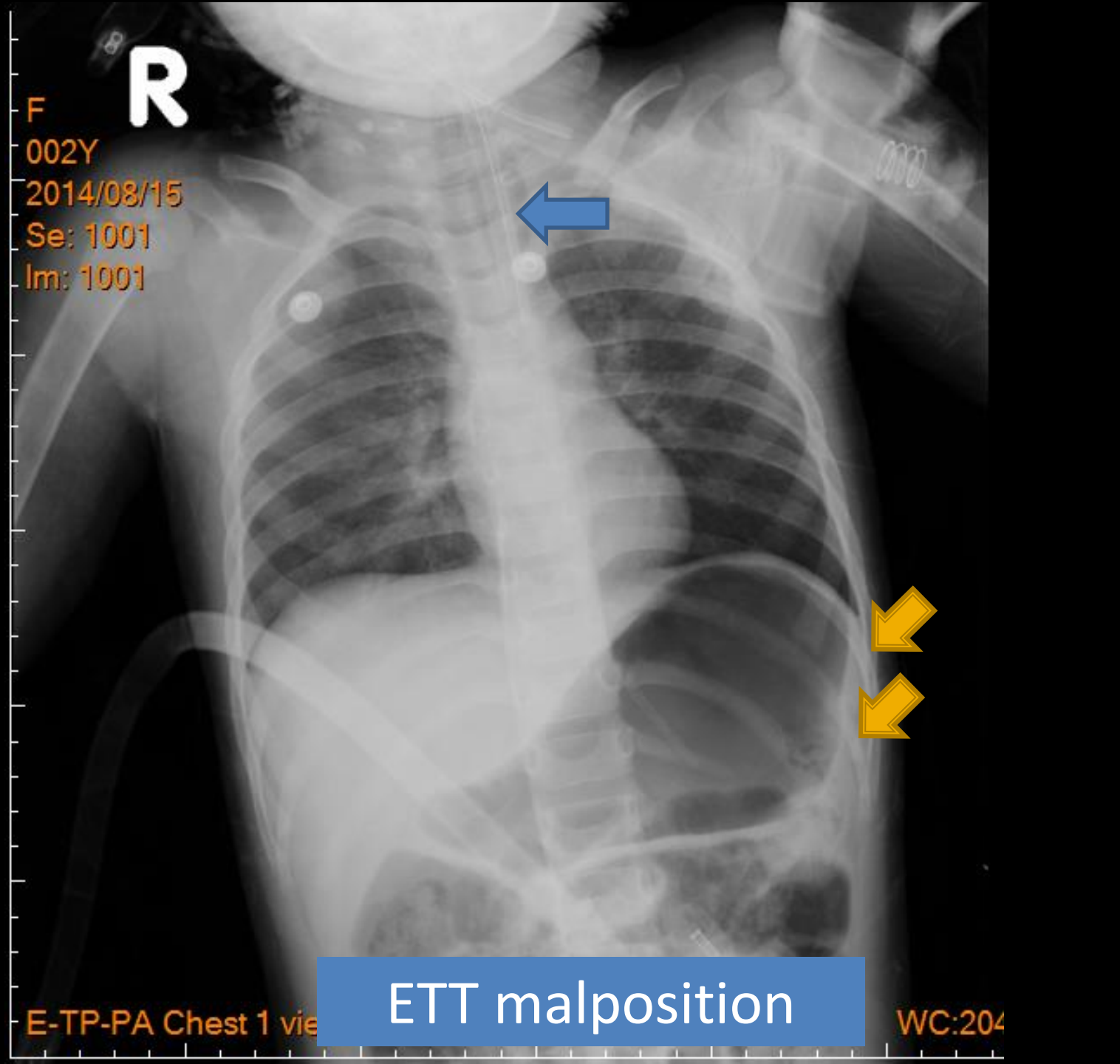
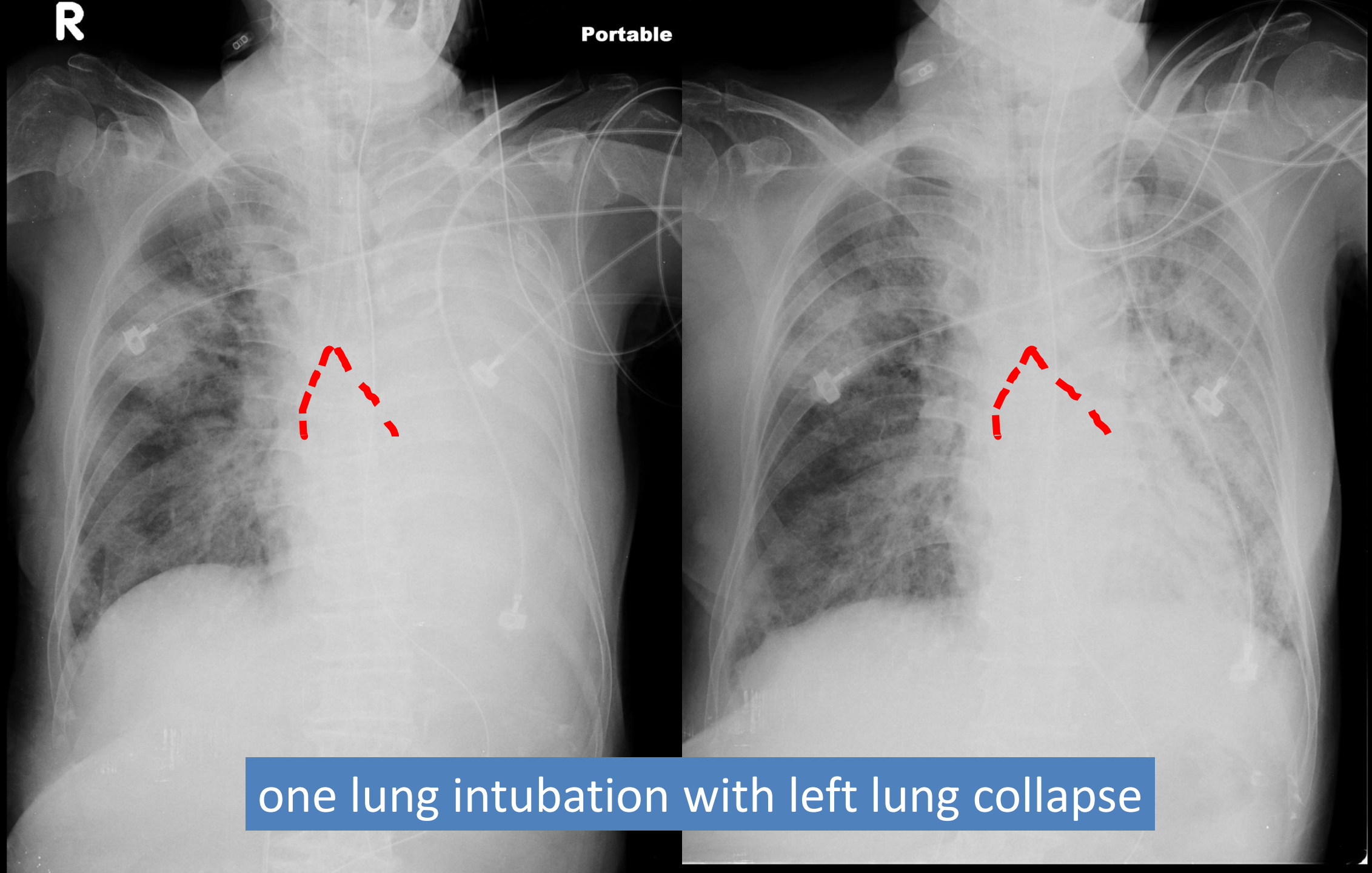
ETT malposition 2

Tube in the oesophagus. CXR evidence:

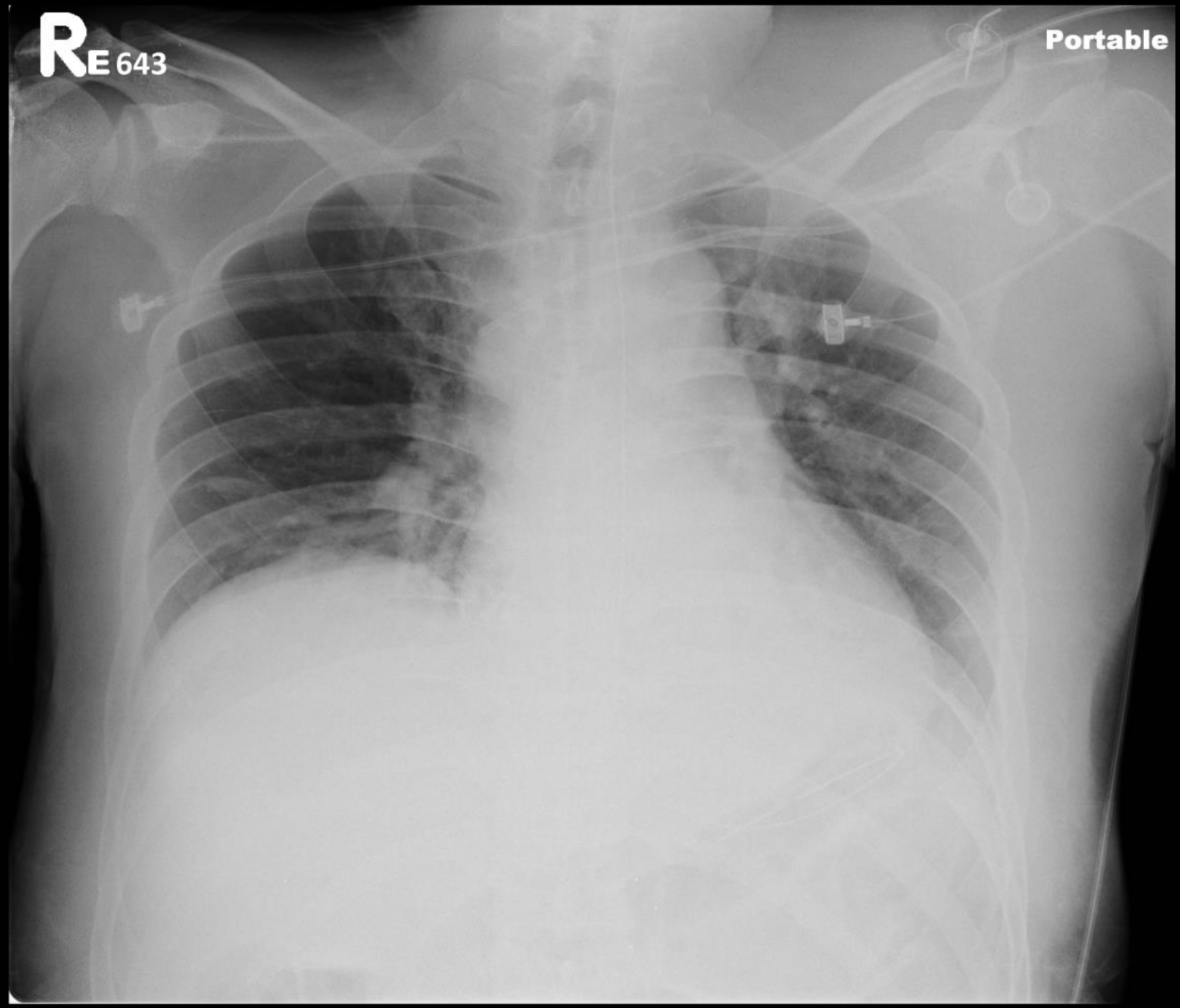
- ETT lateral to the tracheal air shadow
- Oesophagus distended with air
- Stomach distended with air





one lung intubation with left lung collapse

#13
66 / M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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

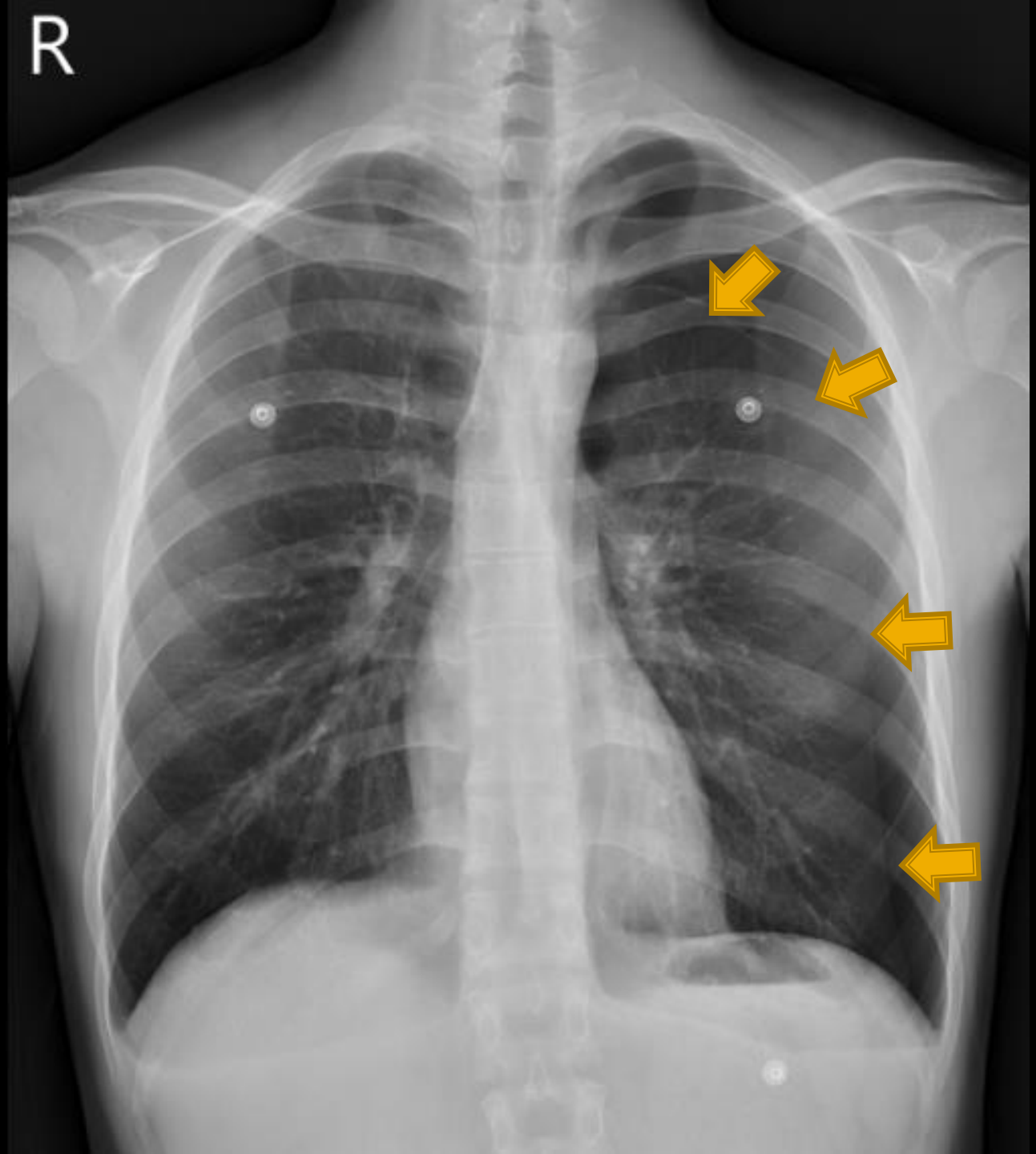
Alongside diffuse + subcutaneous emphysema in a heavy smoker

25

Port-A catheter malposition

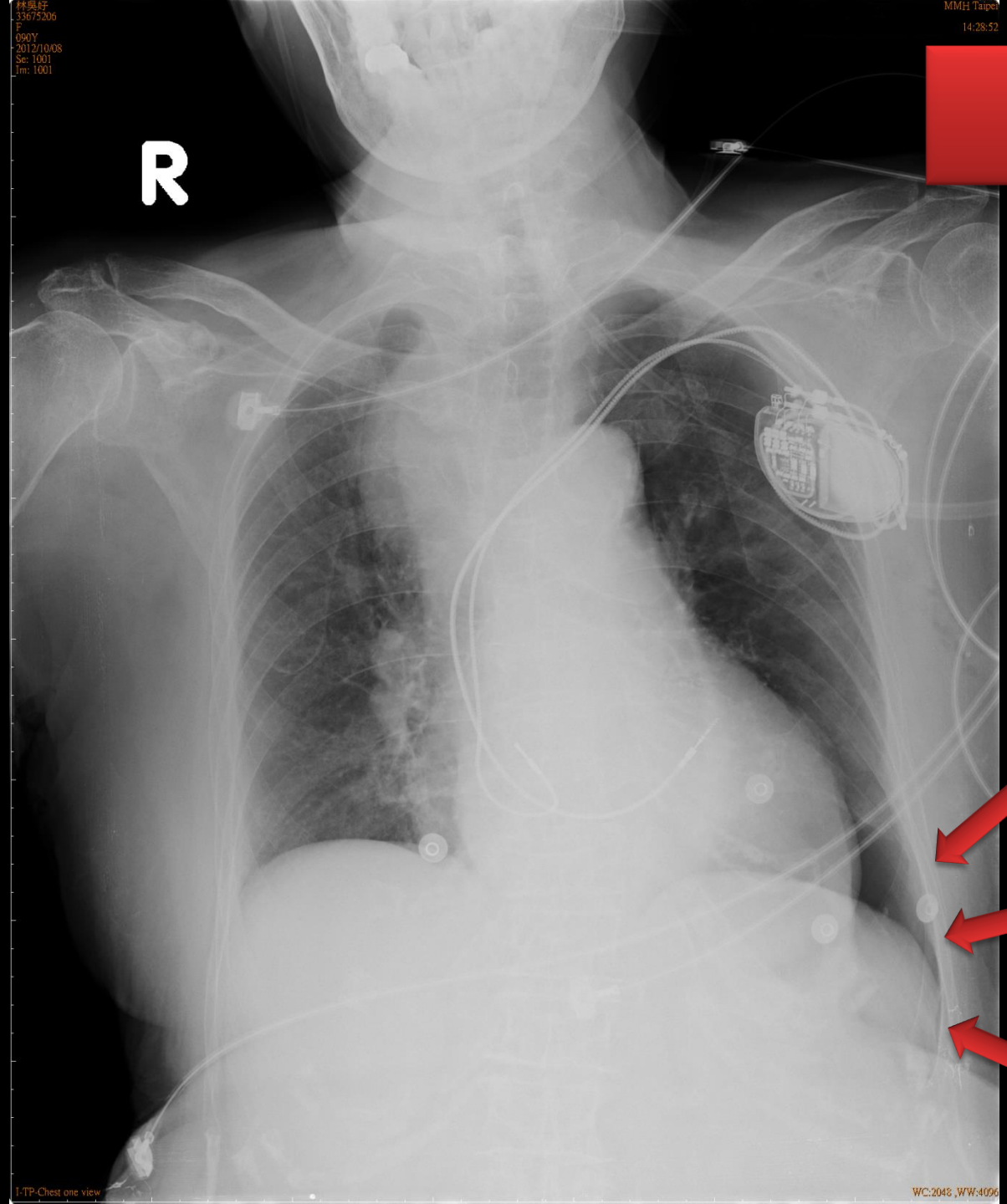
Catheter tip looped into internal jugular vein instead of SVC/right atrium

Pneumothorax

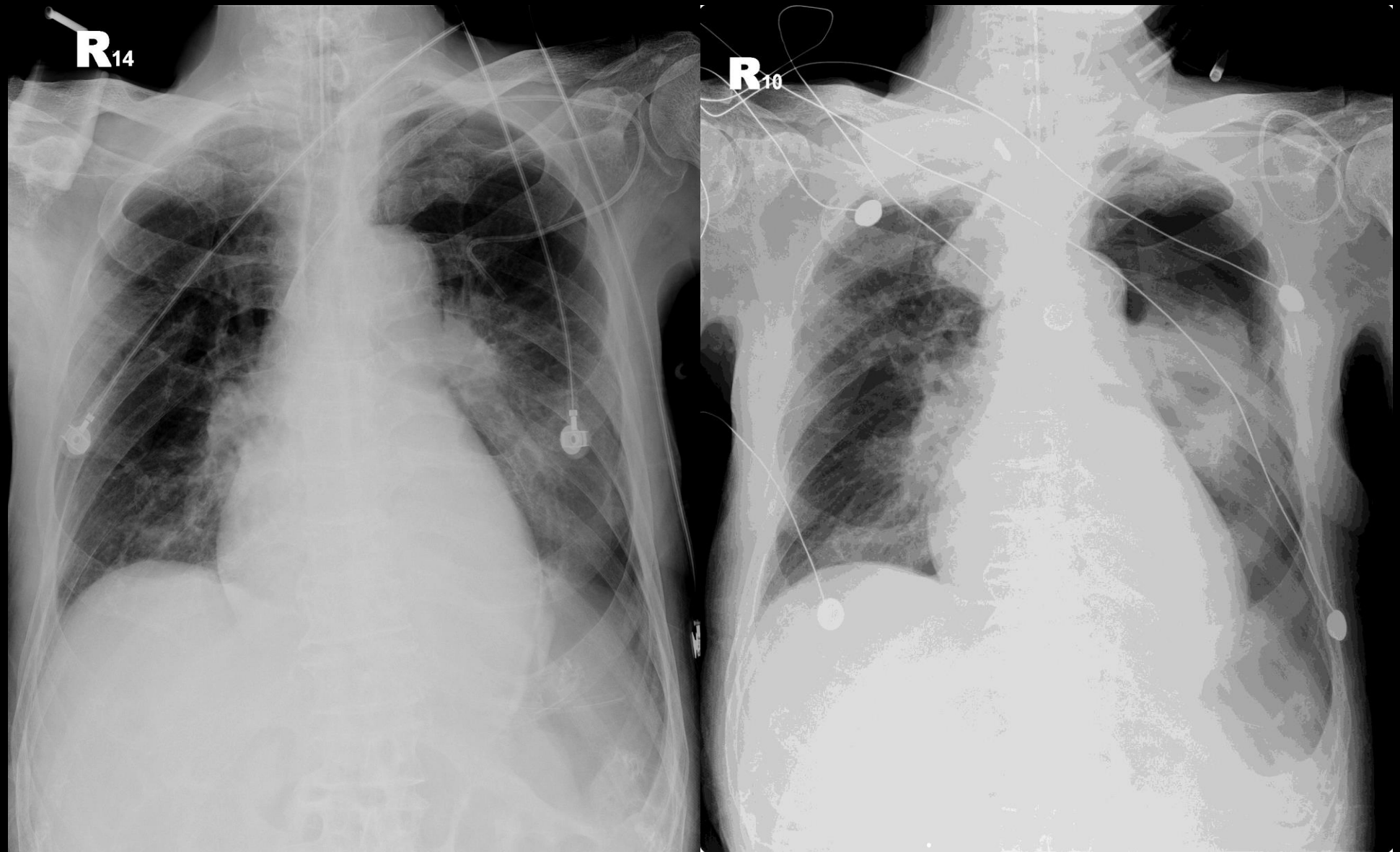


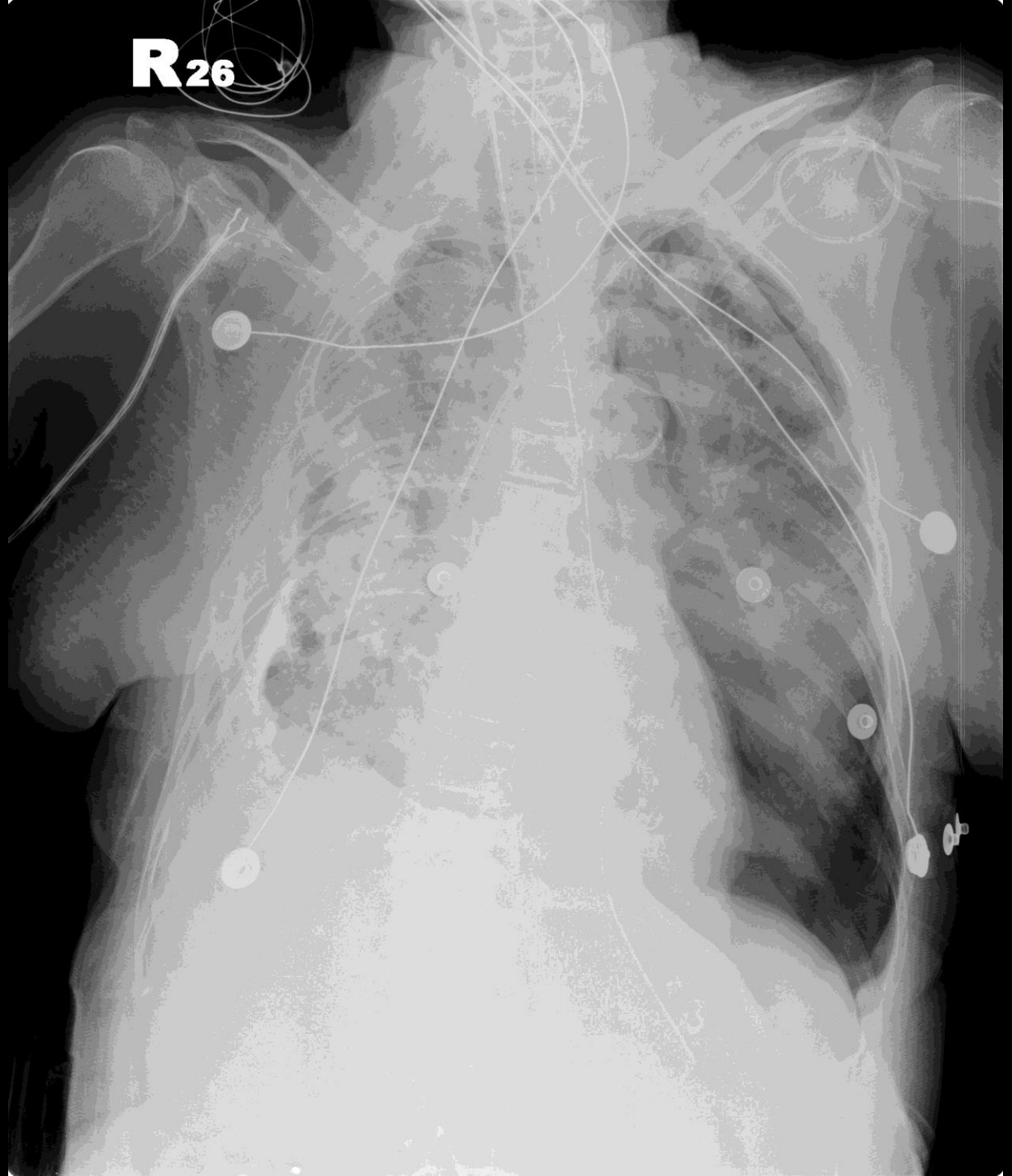
PA View

Deep Sulcus Sign



Deep Sulcus Sign

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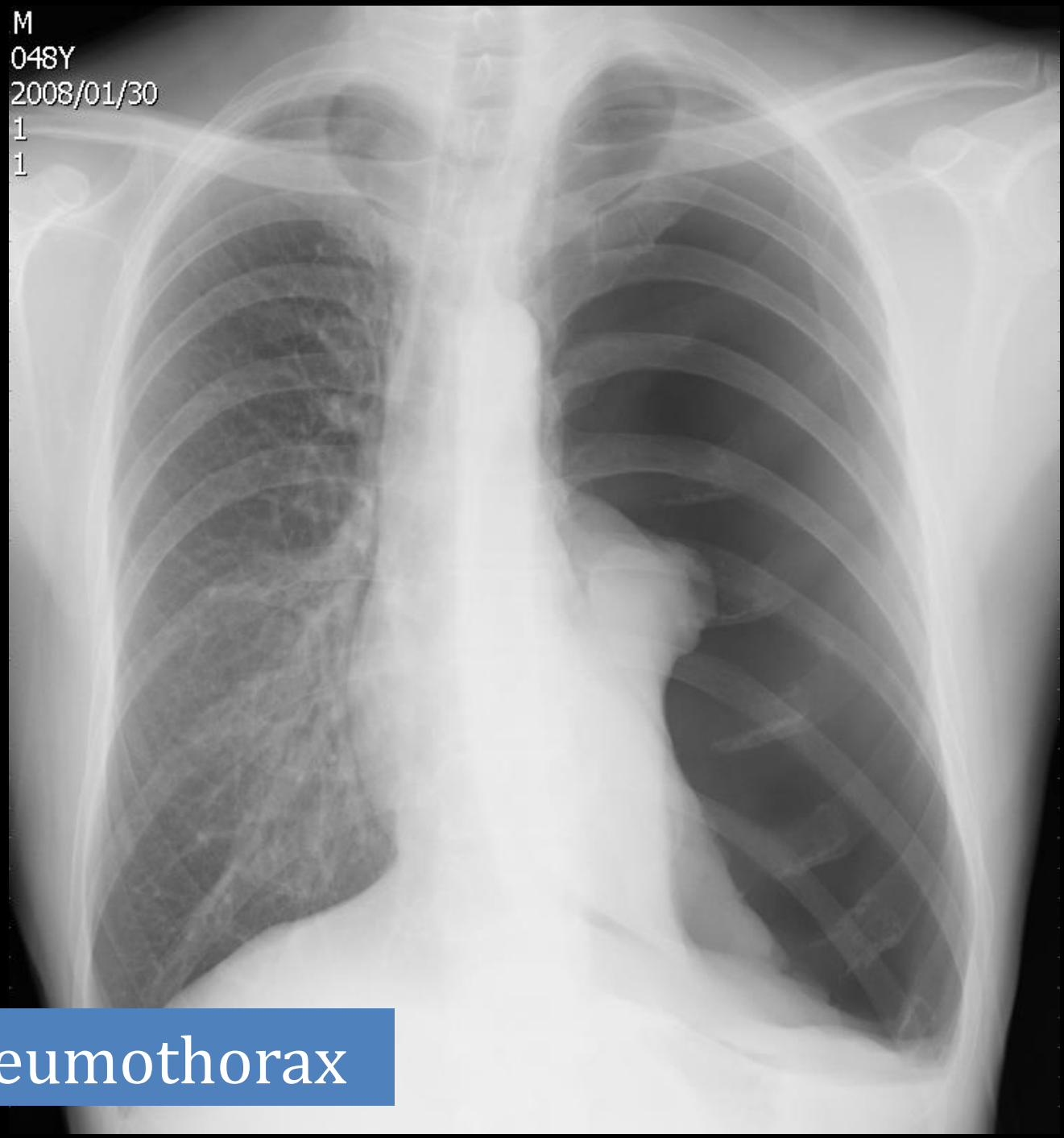
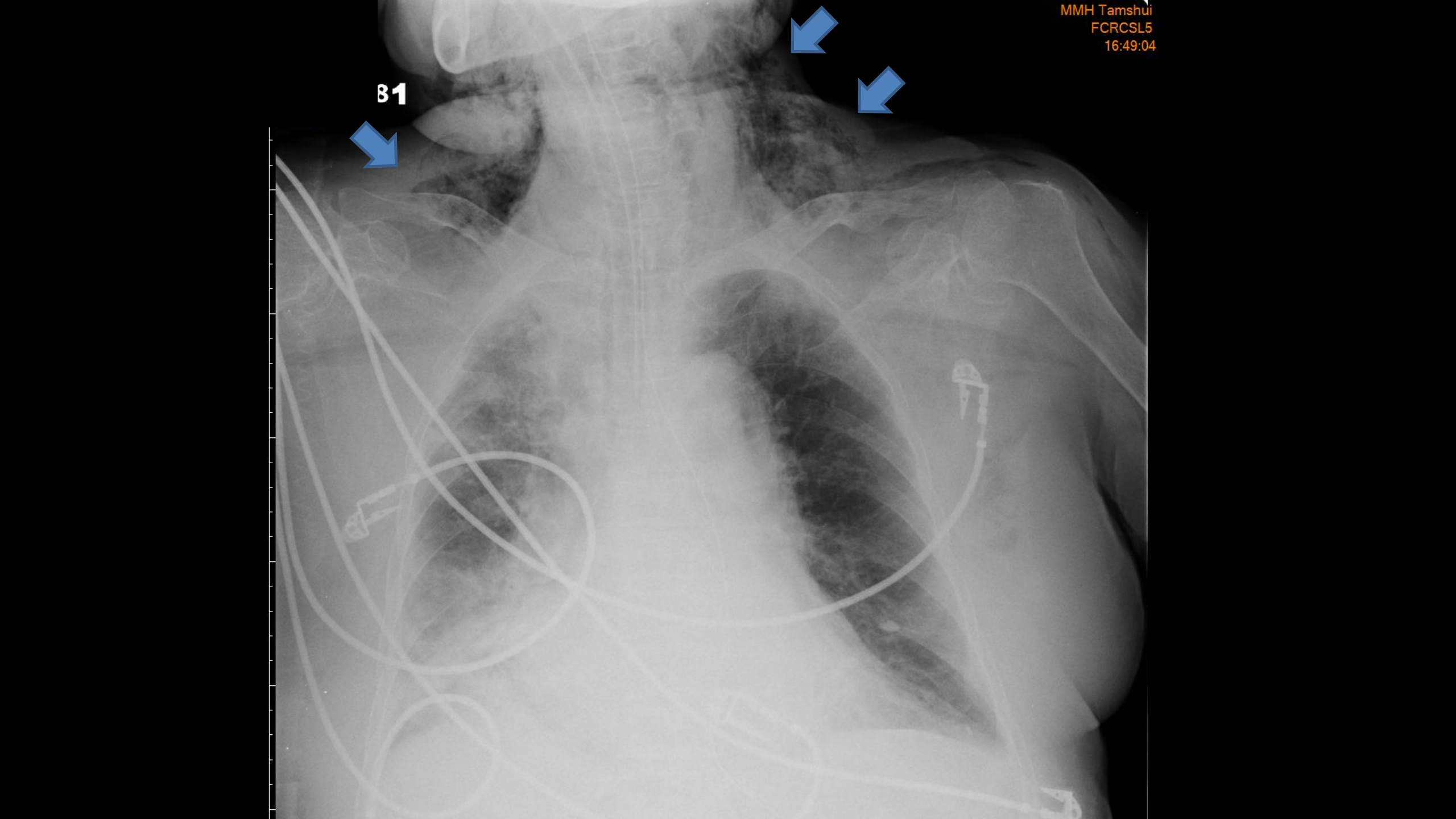


Tension Pneumothorax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81

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)

Drug-induced fibrosis + pneumothorax + pneumomediastinum

25

Combined air-leak pattern over fibrotic lung disease

Right hydropneumothorax (post-pneumonectomy)

25

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 / 縦隔炎 (n=3)

21

Esophageal perforation with mediastinitis

Boerhaave-pattern — mediastinal widening with air

24

Descending mediastinitis

Infection tracking from neck/upper airway into mediastinum

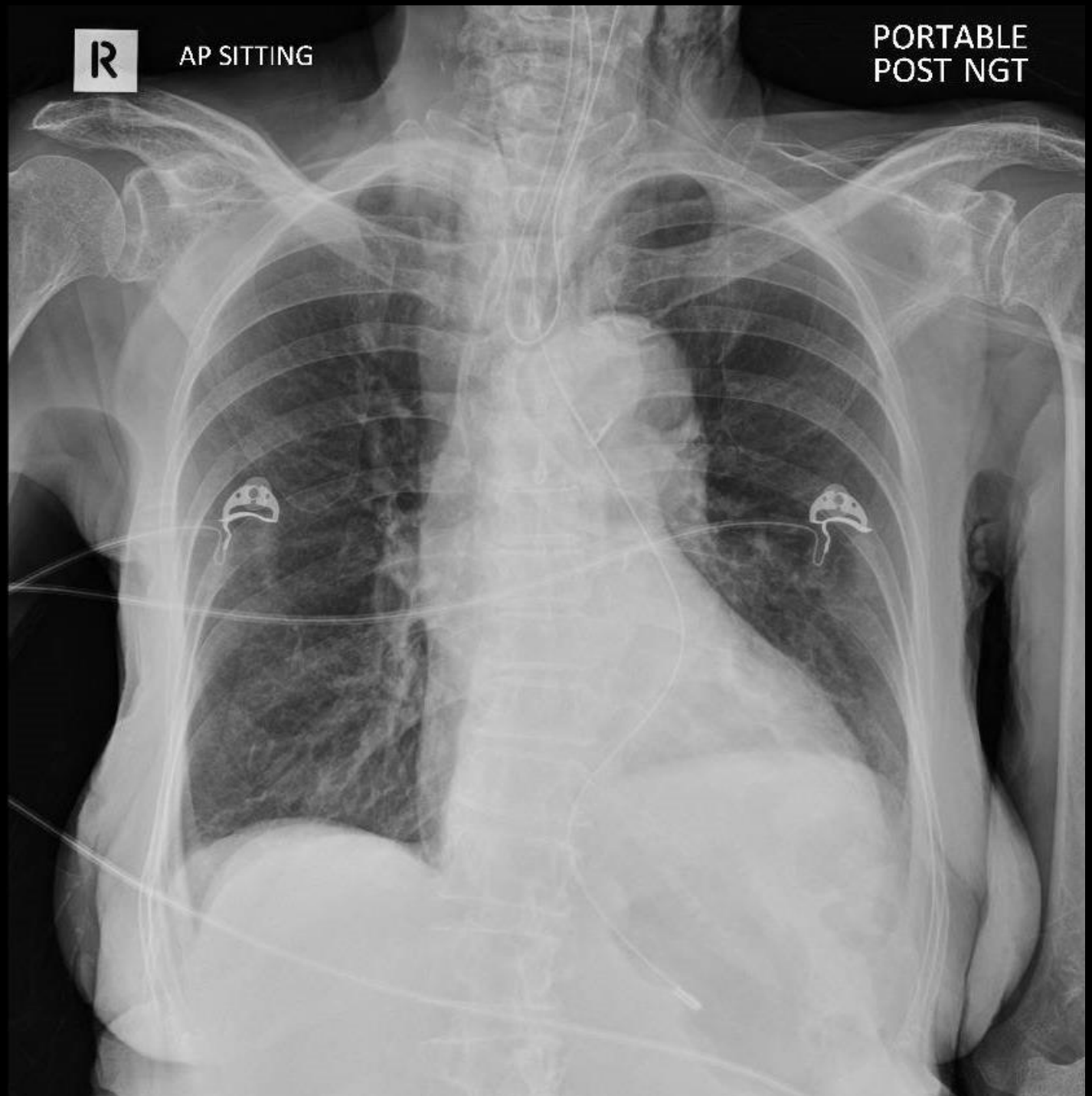
24

Post-esophagectomy anastomotic leak

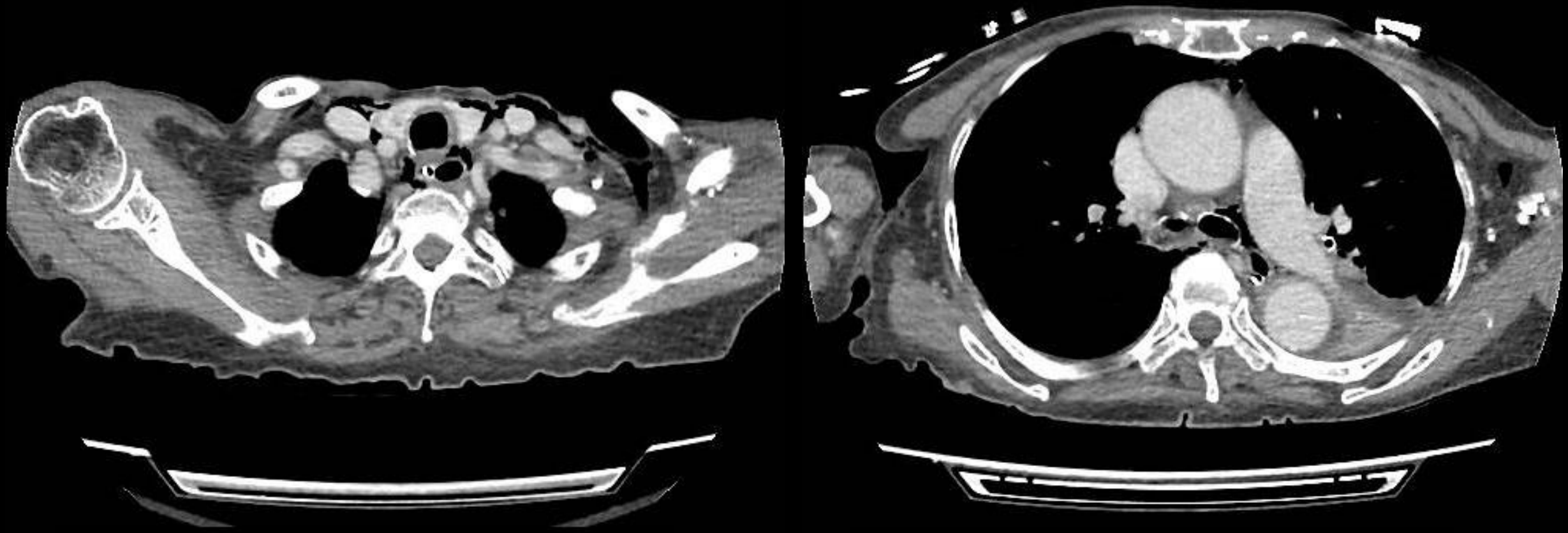
Leak at anastomosis site causing empyema

#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

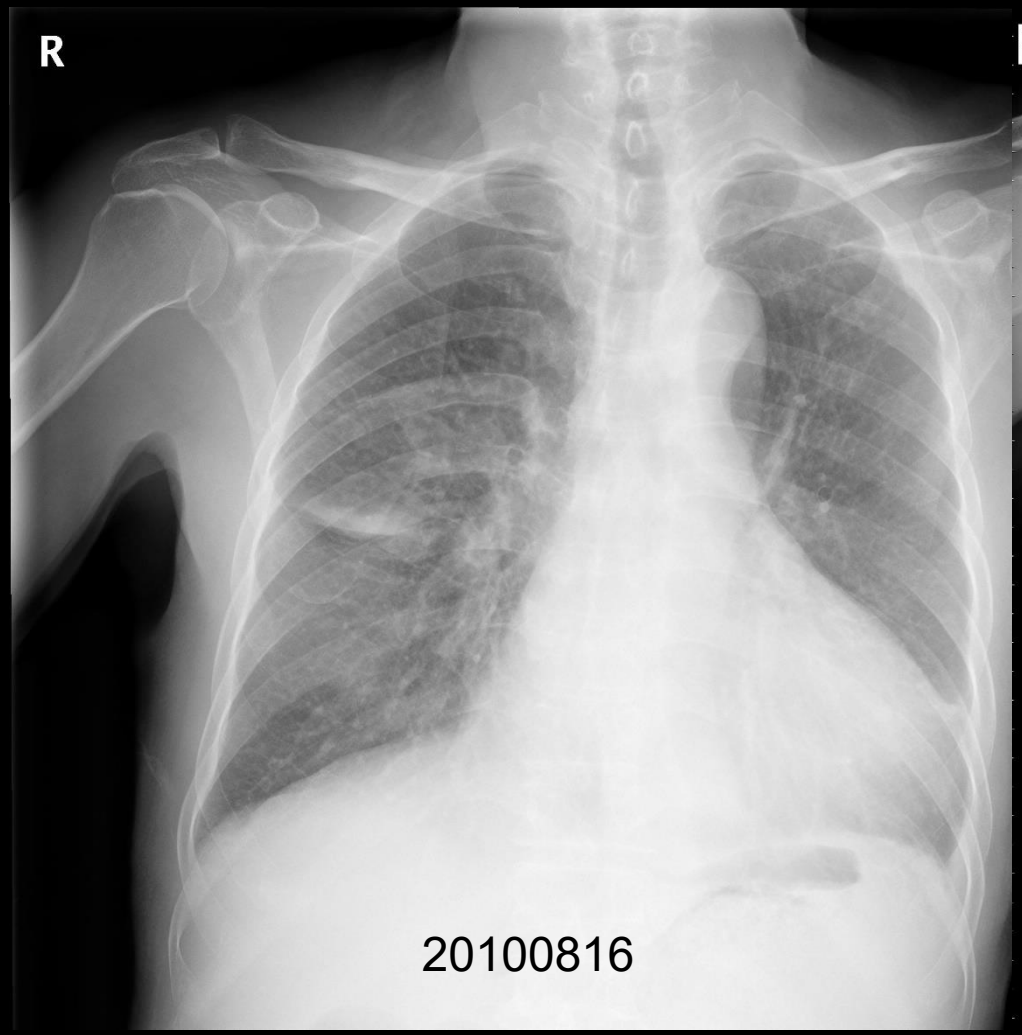
Classic bat-wing perihilar opacities with cardiomegaly

23

Re-expansion pulmonary edema

Iatrogenic — after rapid re-expansion post-drainage

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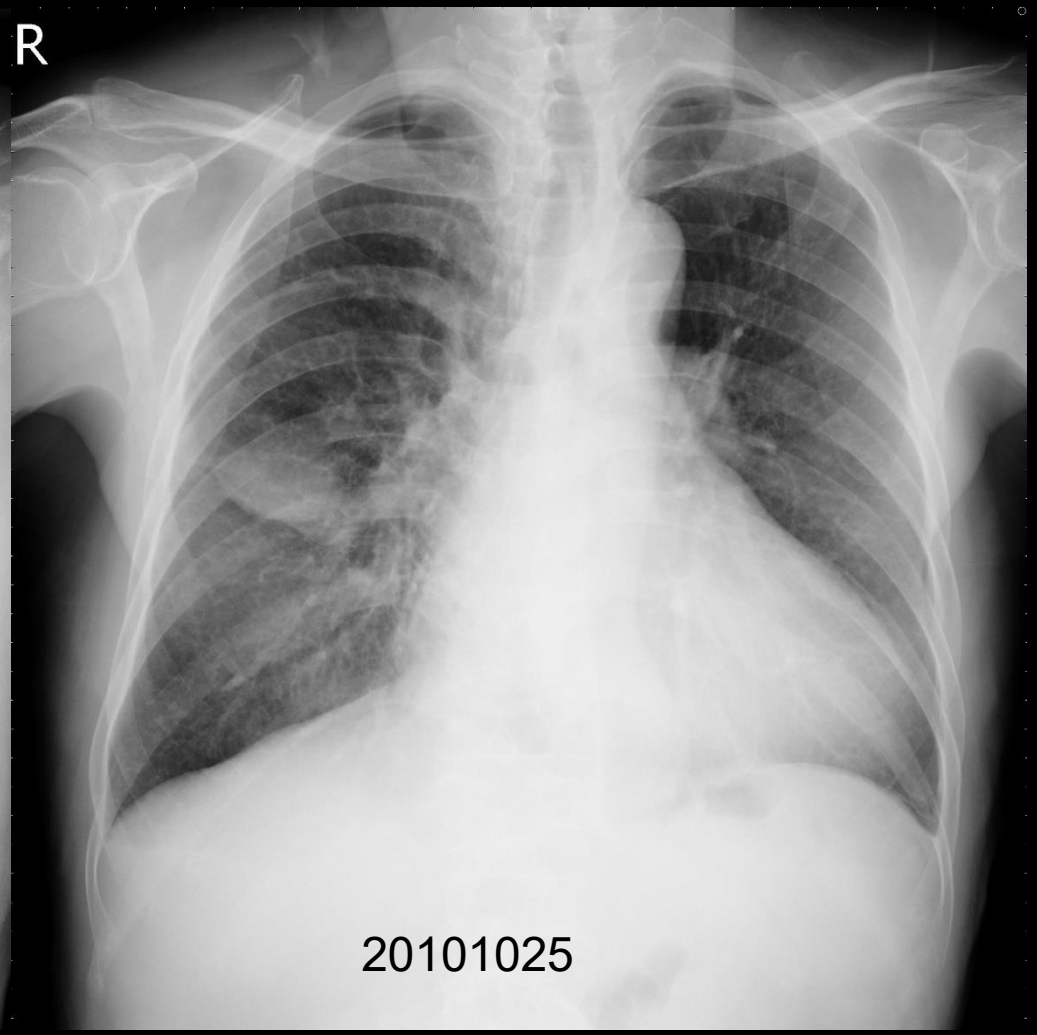
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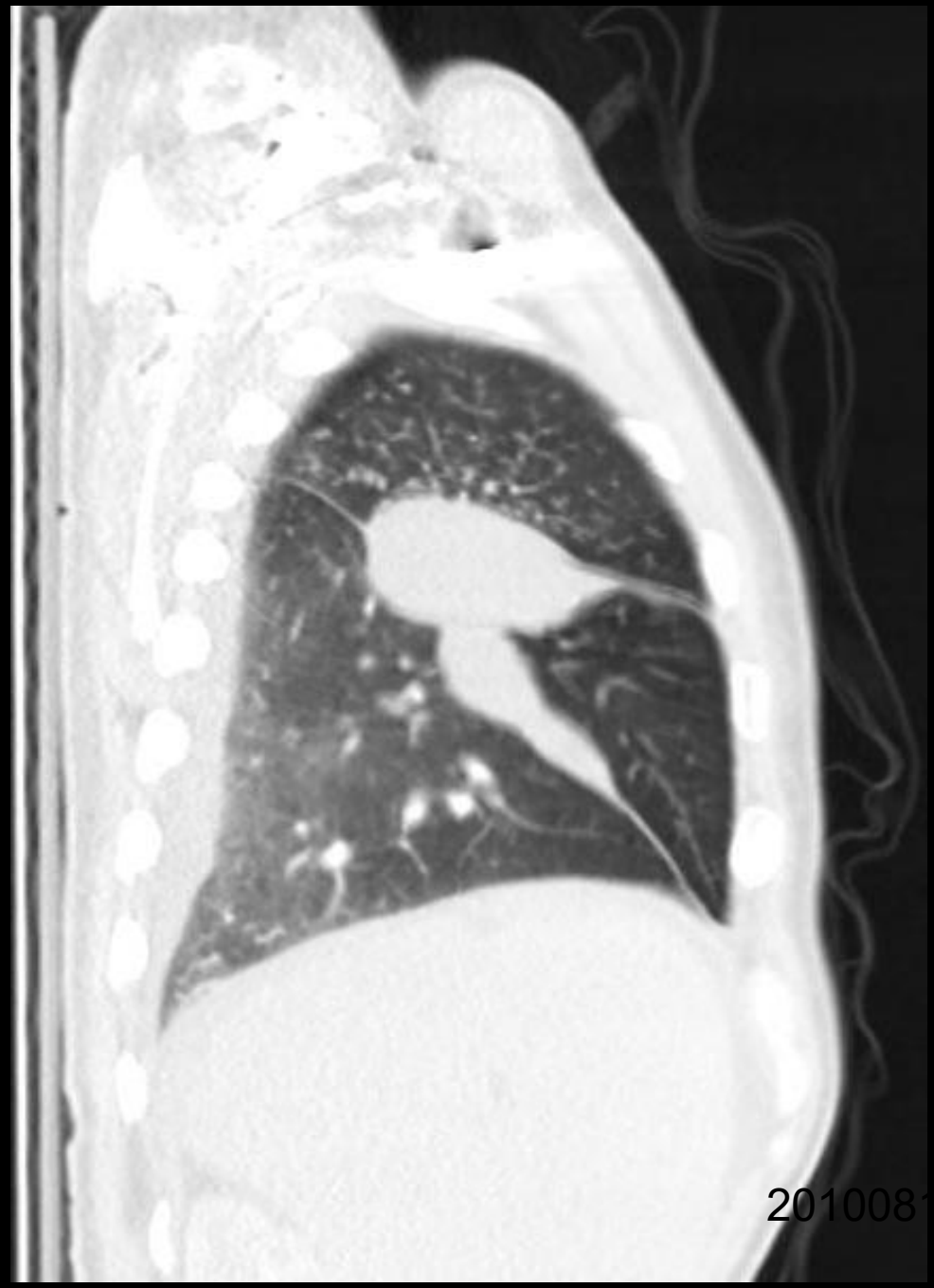


- Interlobular pleural effusion due to heart failure

Septic Shock & Septic Emboli

敗血性休克 / 敗血性栓塞 (n=2)

23

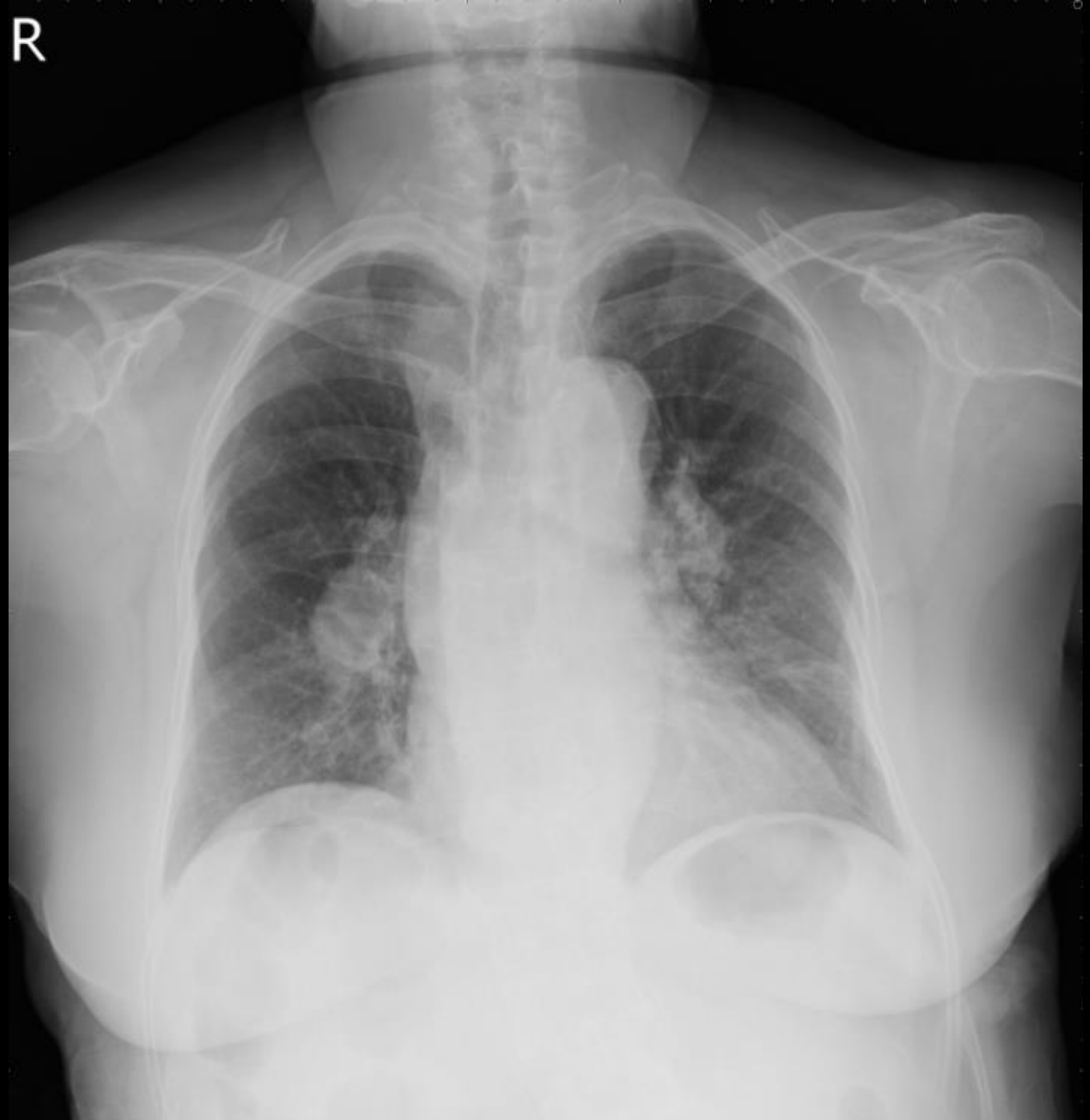
Septic shock — hollow-organ perforation

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

25

Septic pulmonary emboli

Multiple peripheral cavitating nodules — hematogenous seeding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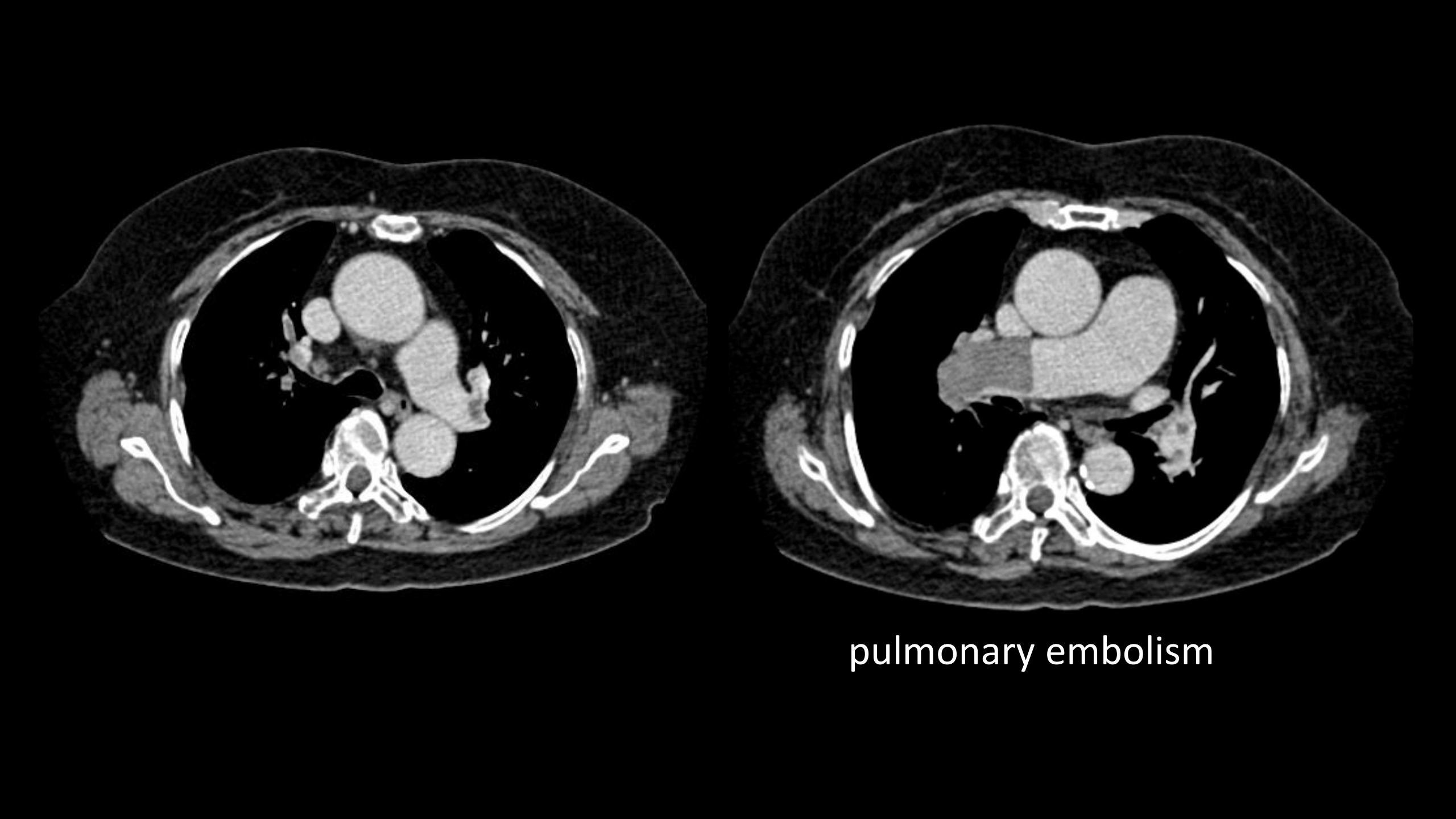
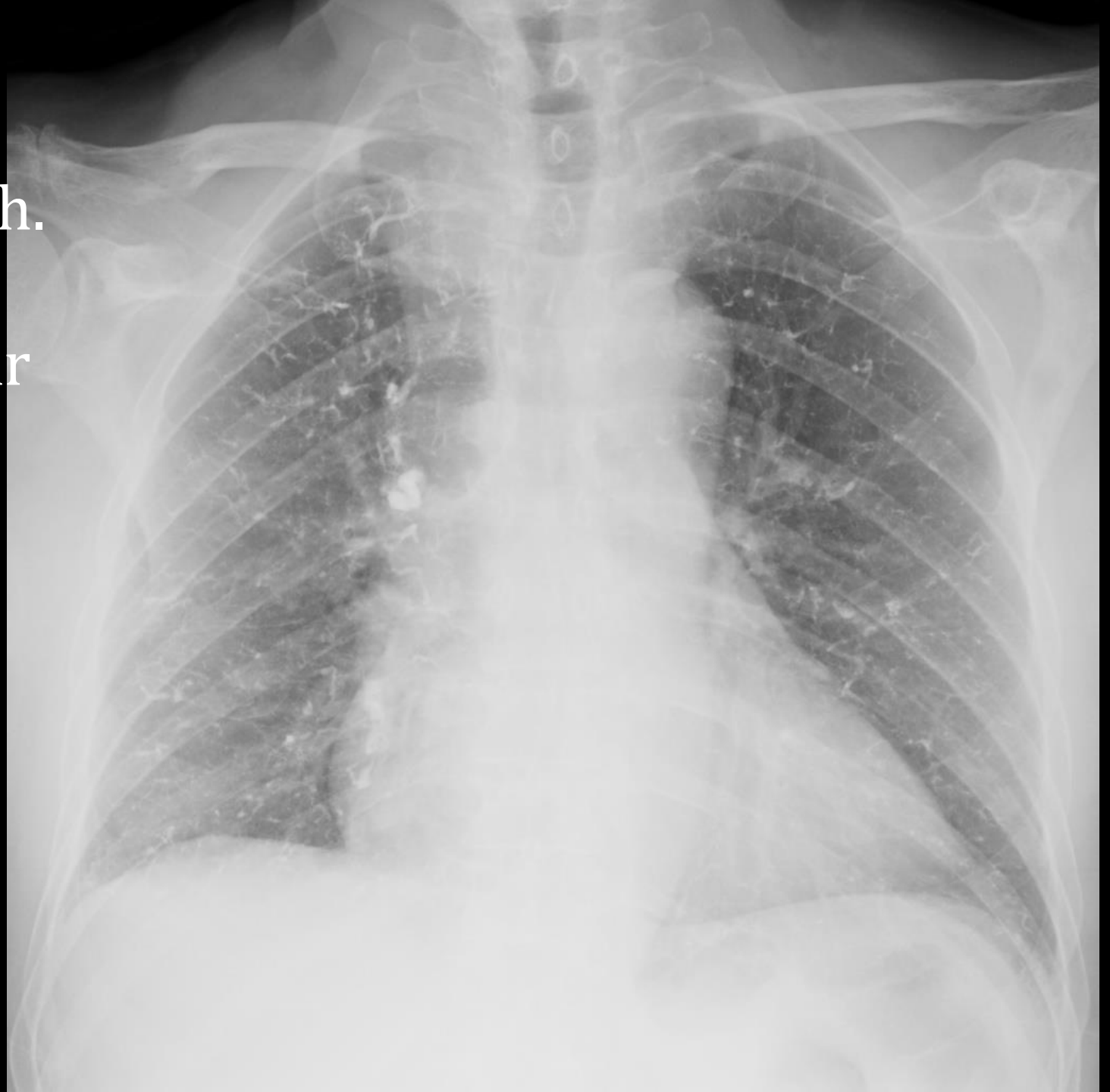


pulmonary embolism

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



Pulmonary Embolism

肺栓塞（含醫源性）(n=2)

23

Acute pulmonary emboli

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

24

Cement embolism

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
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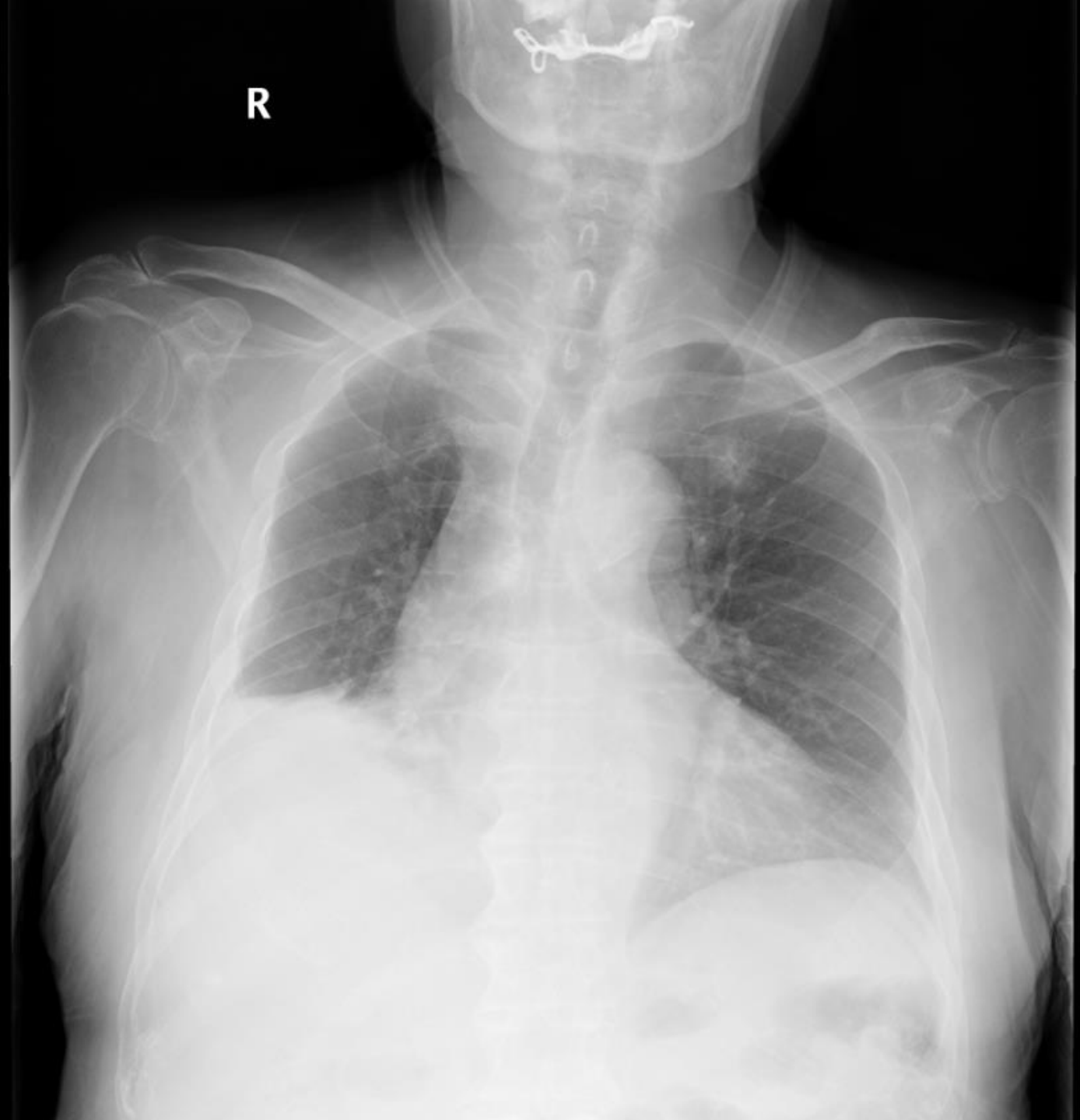
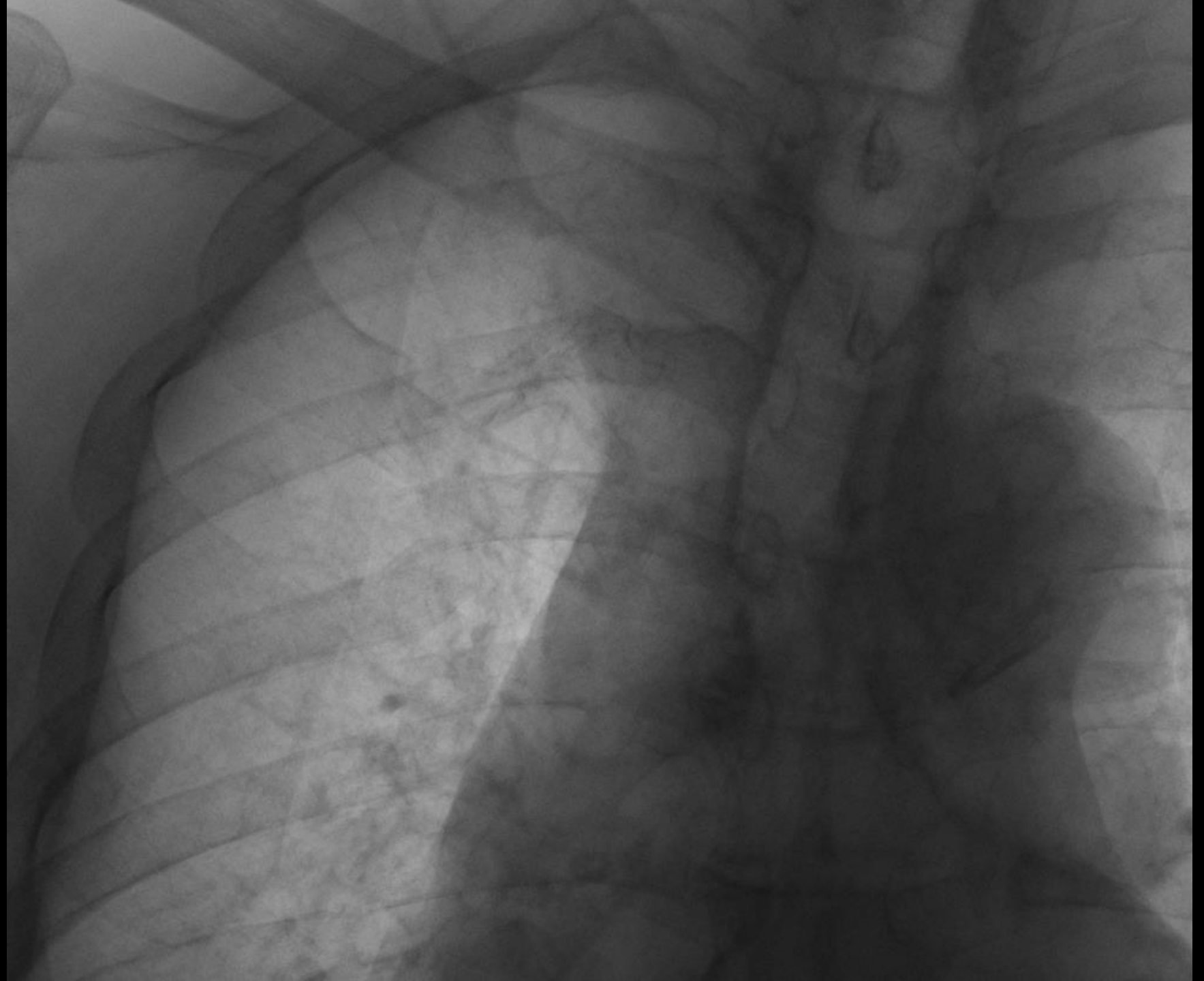
wheezing
breath
sounds for
1 week





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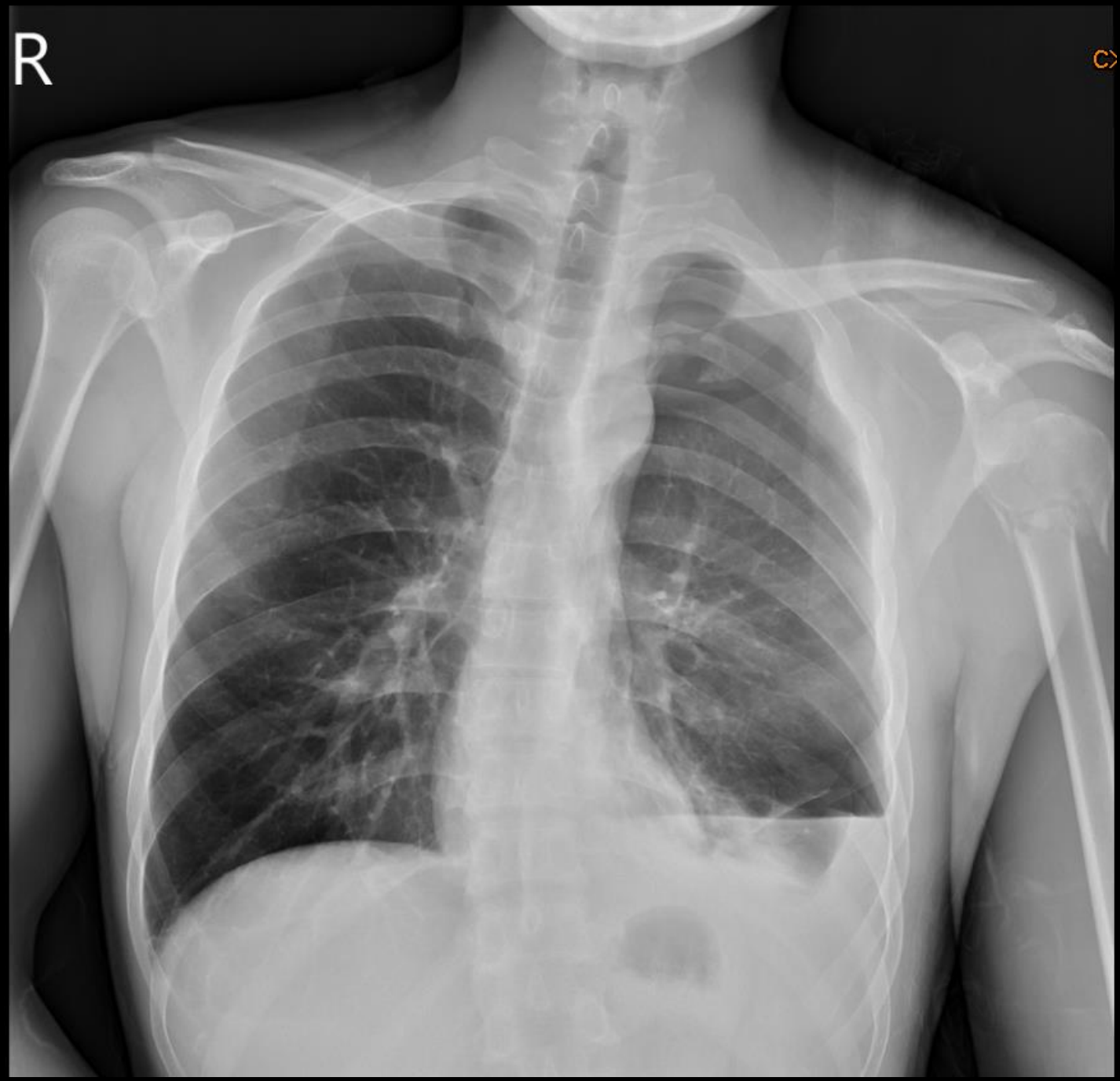
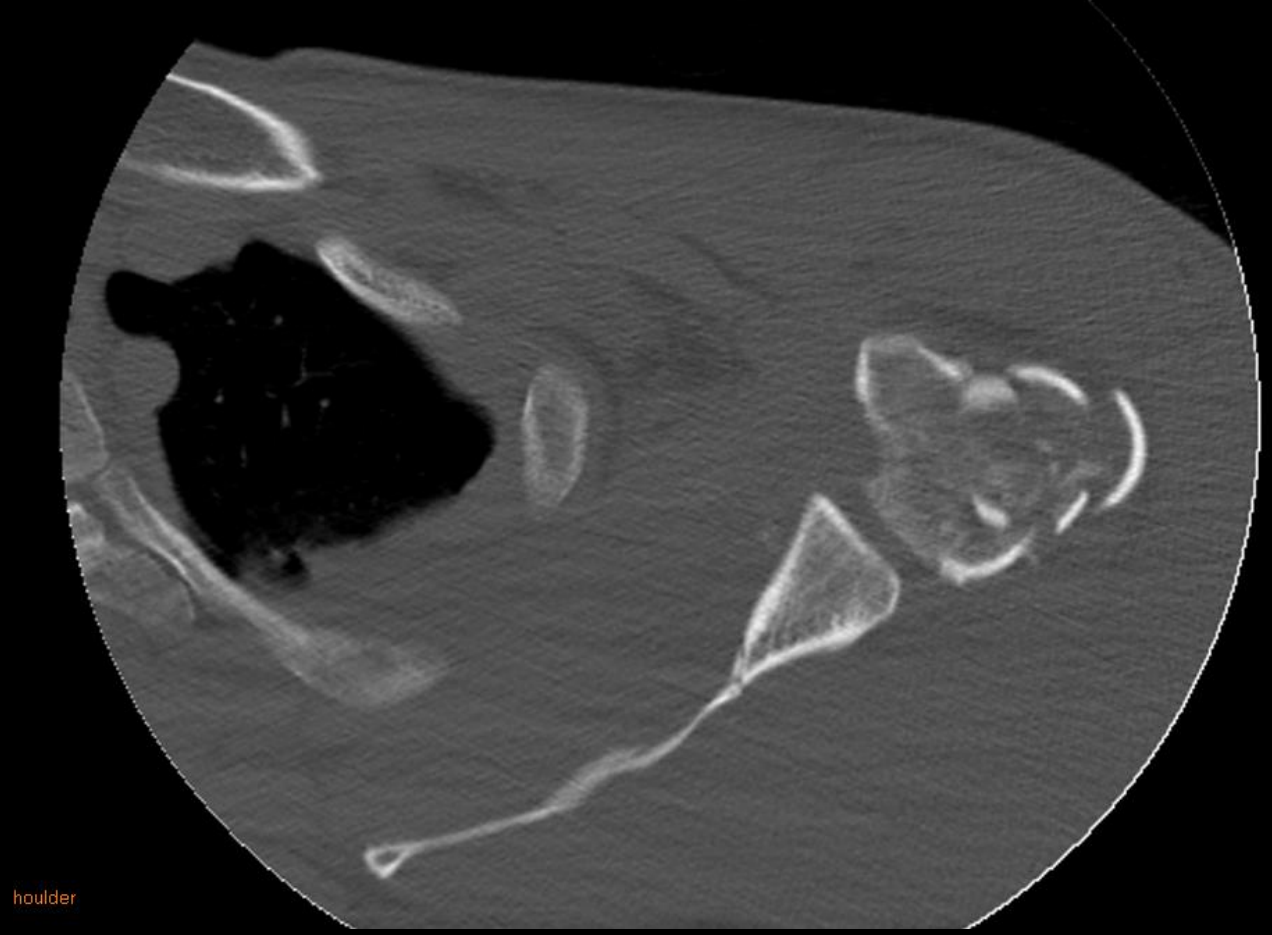
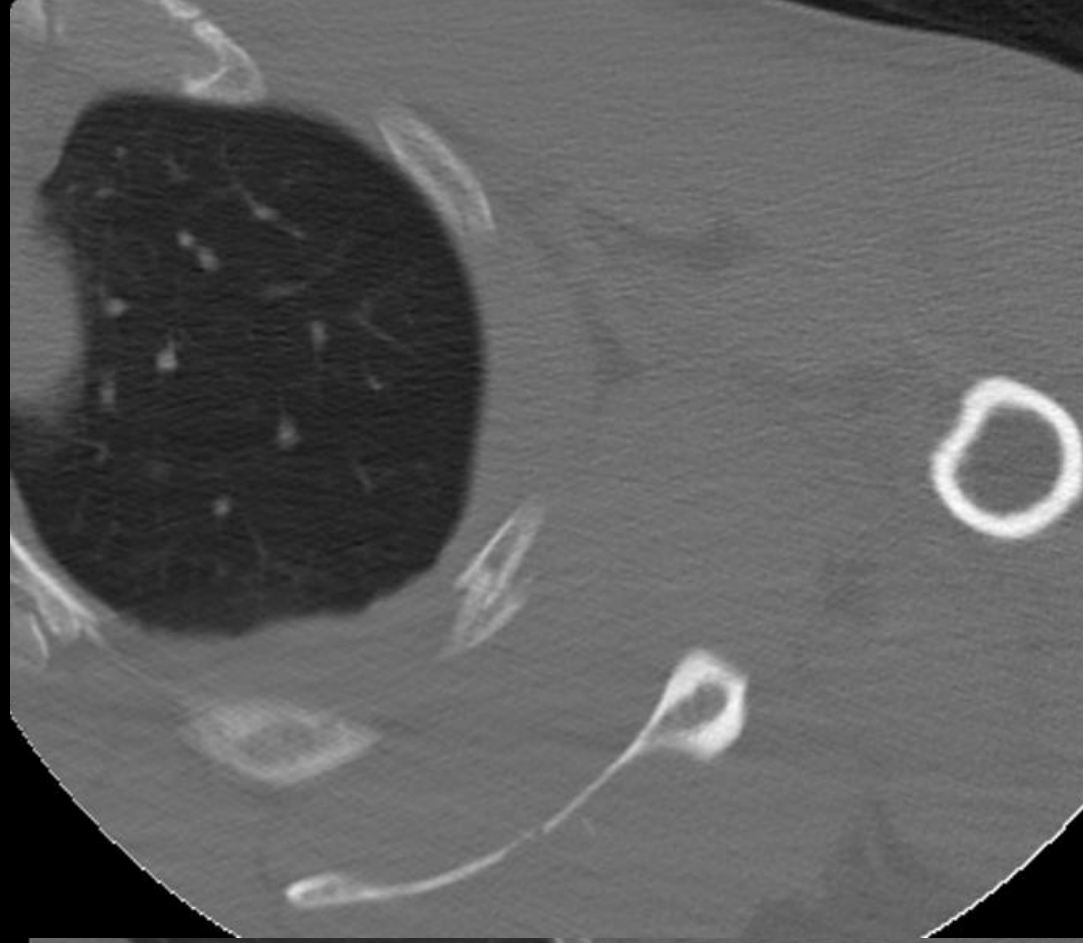
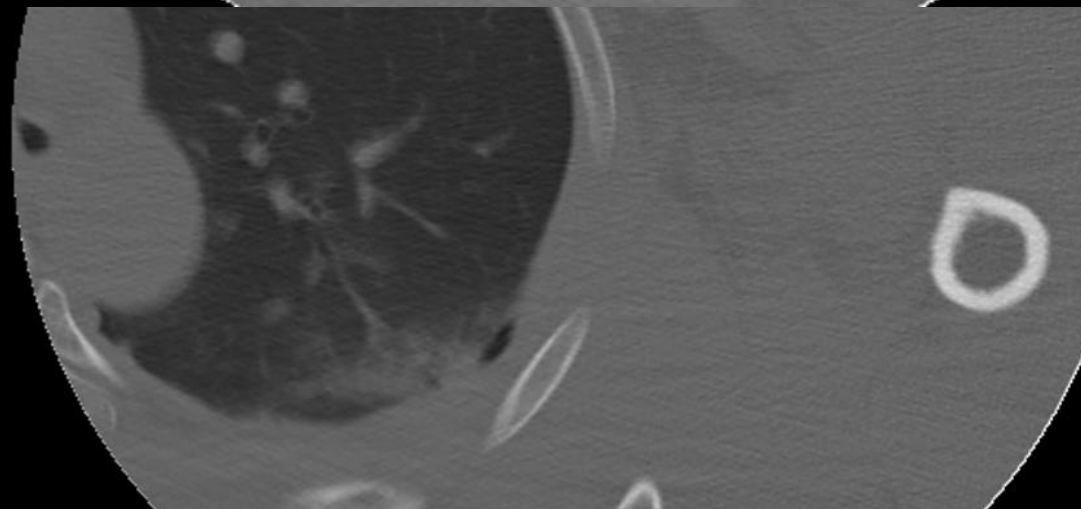
Chest &
left arm
pain









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Left shoulder CT

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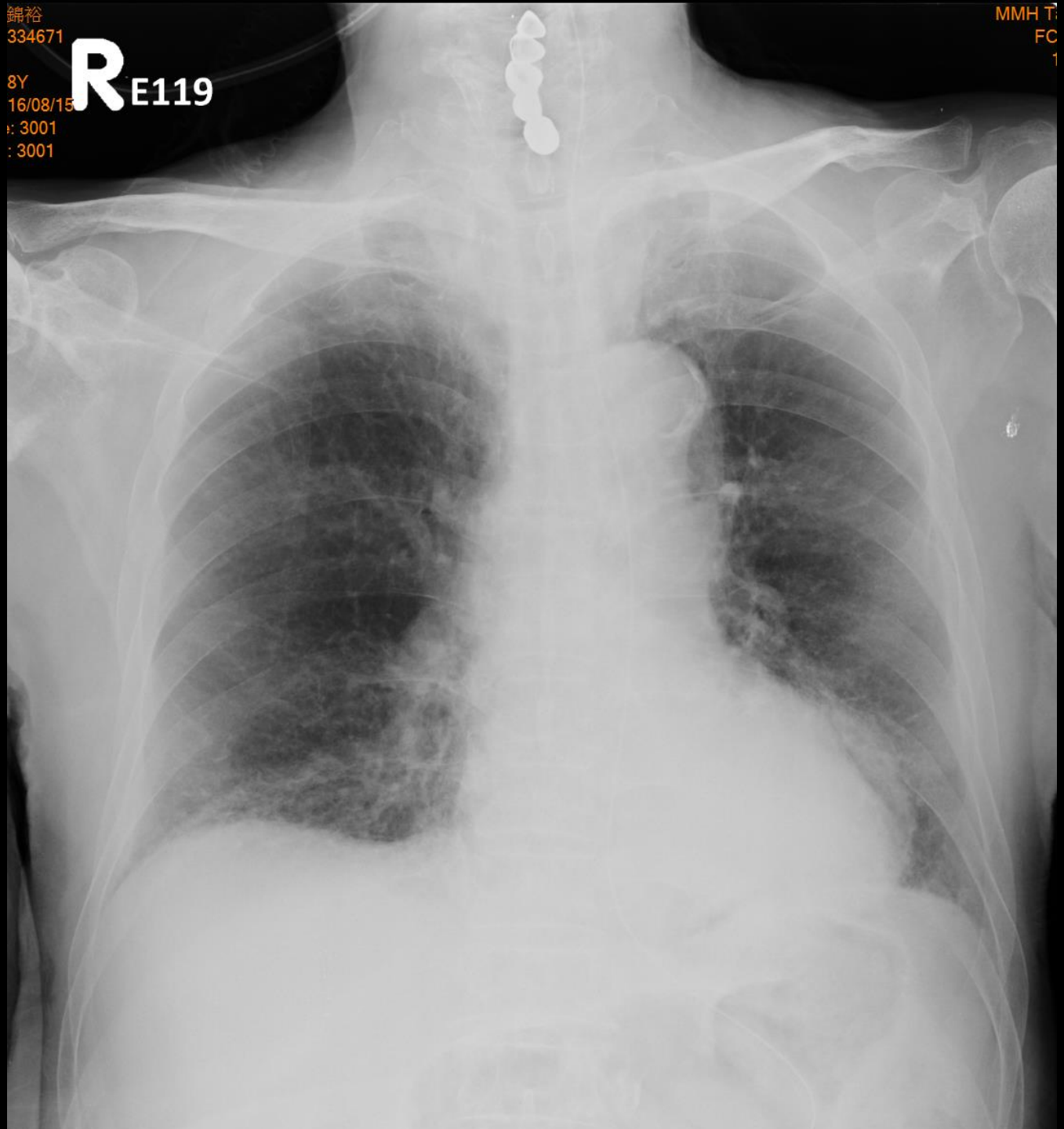
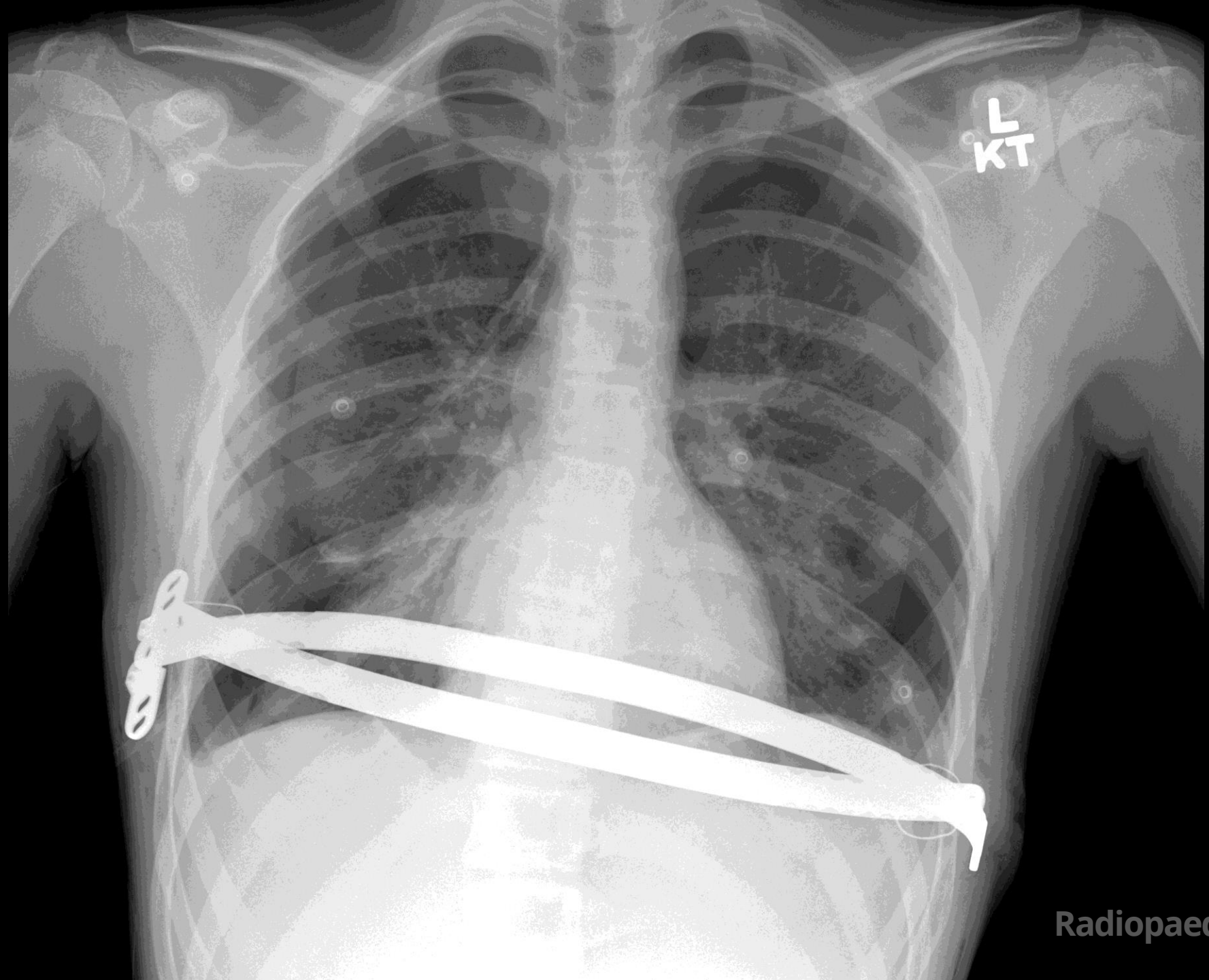
Difficult breathing



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
- **5** Pneumothorax Family
- **4** Pneumomediastinum
- **3** Esophageal Perf. / Mediastinitis
- **3** Cardiogenic Edema / CHF
- **2** Septic Emboli
- **2** Pulmonary Embolism
- **2** Trauma
- **1** Free Air
- **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

Source: TSPCCM specialist-board imaging exam answer keys, 2021–2025 (110–114年度)

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？）