# BILATERAL PLEURAL EFFUSIONS POST ADMINISTRATION OF TOTAL PARENTERAL NUTRITION VIA A CENTRAL VENOUS CATHETER


Wexford General Hospital

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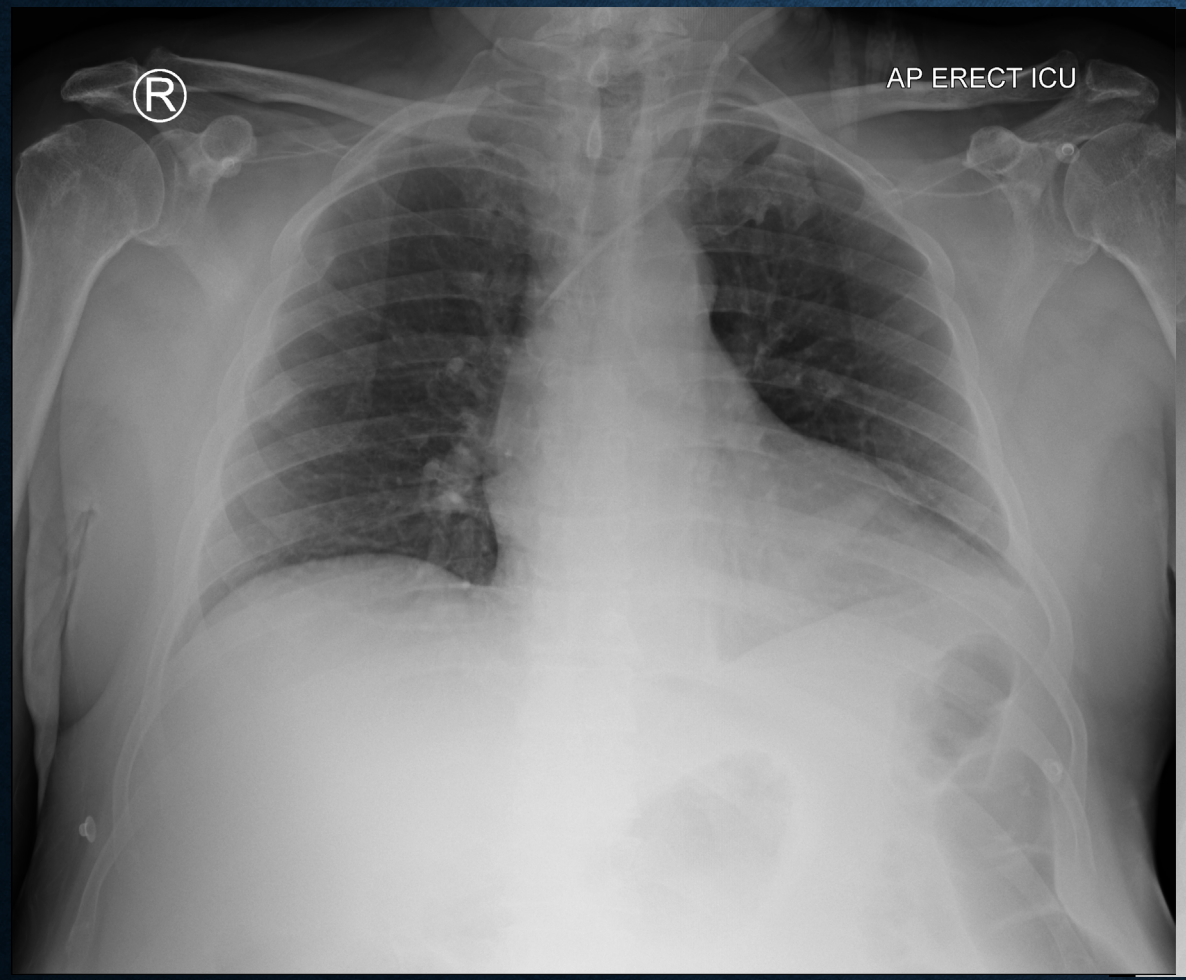
- 67-year-old man was admitted for elective anterior resection and loop ileostomy 28/04/20 for circumferential stenosing rectosigmoid tumour at 15cm.
- B/G: dyslipidaemia, osteoarthritis, L4/5 spinal fusion. Non smoker
- Enterocutaneous fistulae at laparotomy wound noted on the 18/05
- Started on IV Tazobactam, Metronidazole and Octreotide
- High output from fistulae so patient kept NPO and central line re-inserted for TPN on the 19/05

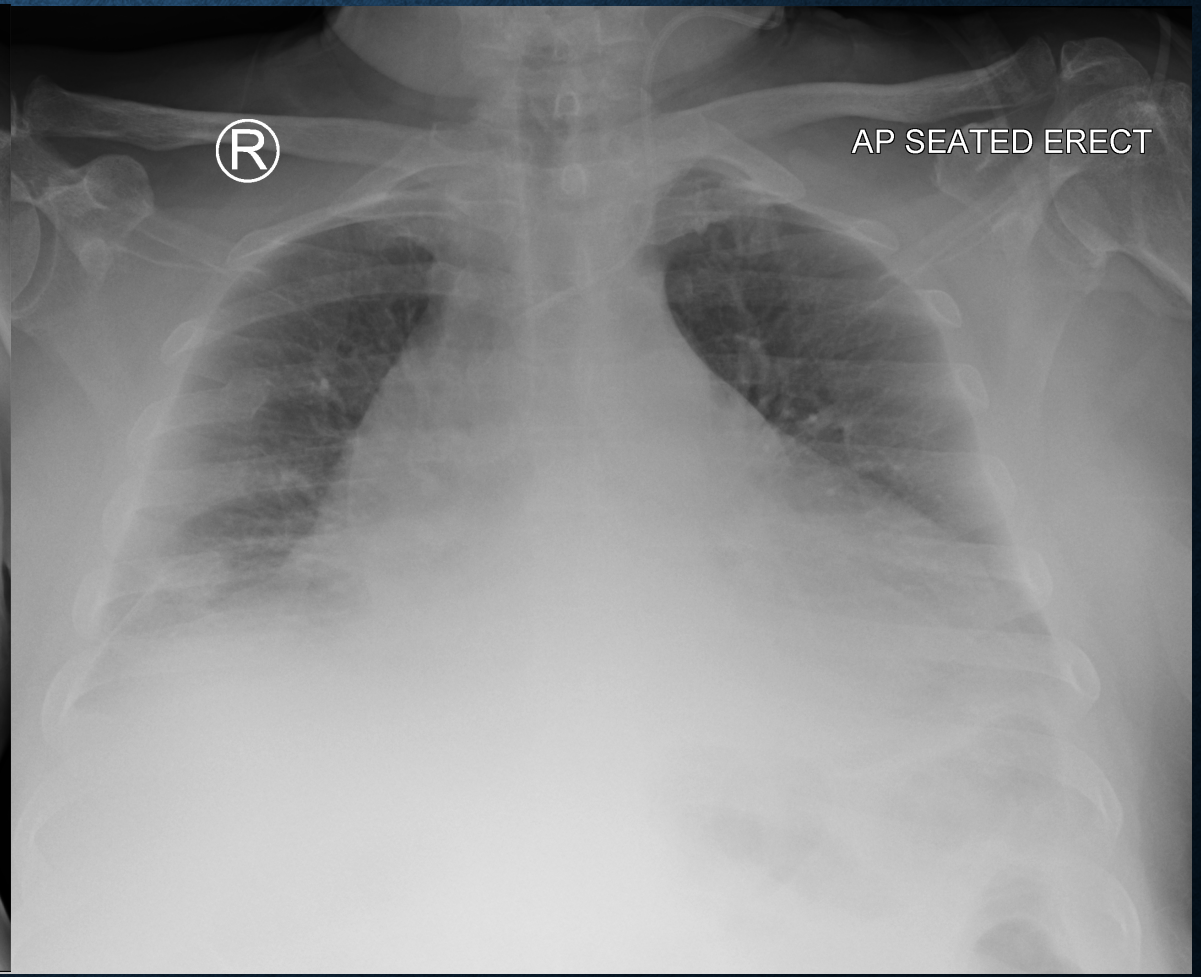
# 9 DAYS POST CVC PLACEMENT

- 28/05 Patient complained of pleuritic chest pain with increased work of breathing
  - On examination:
    - SpO2 96% to 92% on room air, RR 20, hr 74bpm, bp 148/88, Apyrexial.
    - No respiratory wheeze, reduced air entry left lower zone
    - No lower limb pitting oedema
  - Troponin and BNP negative
  - WCC 9.4, CRP 15

19/05




28/05



- Chest X Ray shows increased cardiothoracic ratio with opacification of lung bases. Tip of CVC catheter seen in left brachiocephalic vein at origin of SVC
- D-Dimer 4.18.
- Started on therapeutic Enoxaparin and CTPA requested

**BILATERAL PLEURAL EFFUSIONS AND ASSOCIATED ATELECTASIS, LARGE ON RIGHT, MODERATE ON LEFT**
**FLUID AND STRANDING THROUGHOUT ANTERIOR MEDIASTINUM**

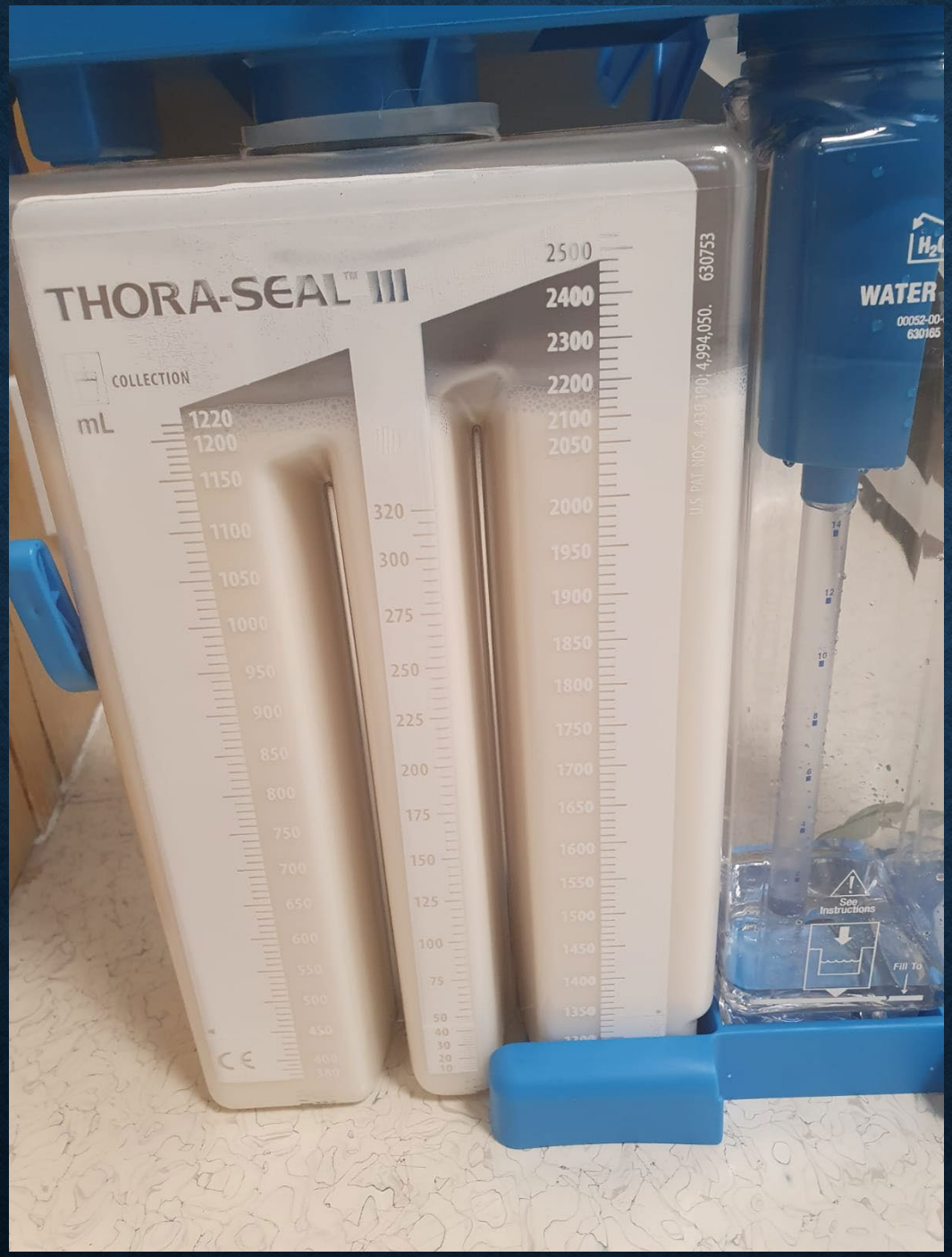
# PERICARDIAL EFFUSION

# CTPA

- Pericardial effusion with depth of 1.7cm
- Ground-glass opacities with stranding of the anterior mediastinal fat
- Bilateral pleural effusions with underlying lung collapse most marked on the right hand side
- No pulmonary emboli or infarction

# 29/05

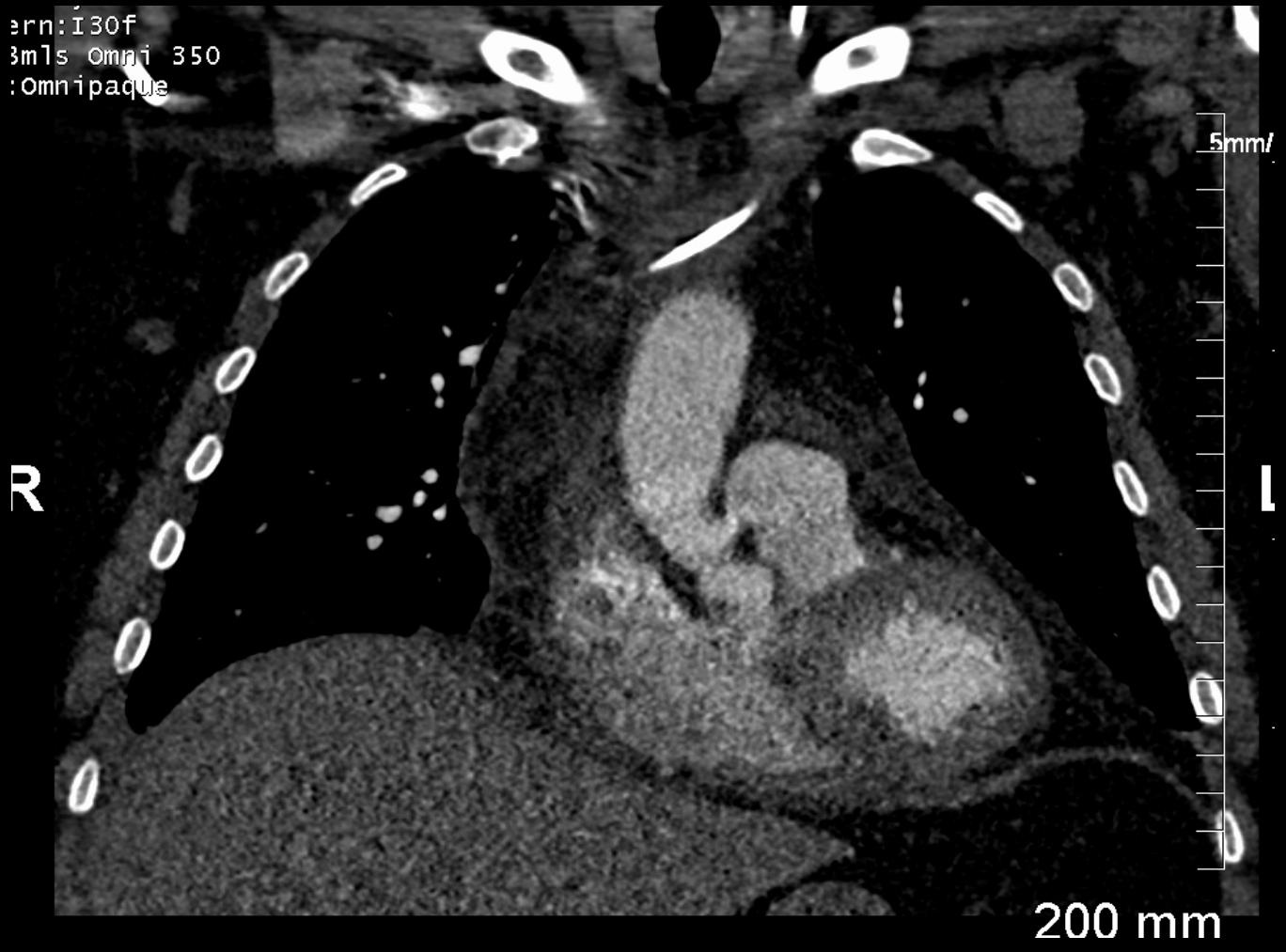
- Worsening respiratory distress despite starting a loop diuretic
  - Negative BNP
  - ECHO – good left ventricular function, small pericardial effusion
  - Persistent positive fluid balance
    - 28/05 Intake – 3050ml, Output 1650ml
    - 29/05 Intake – 3000ml, Output 1400ml
  - EWS = 10, bp 160/110, hr 110, RR 28, SpO2 90% on 4L/min
  - complaining of SOB and chest pain
- Decision made to insert right intercostal chest drain to relieve pleural effusion
- CTPA re-examined by reporting radiologist



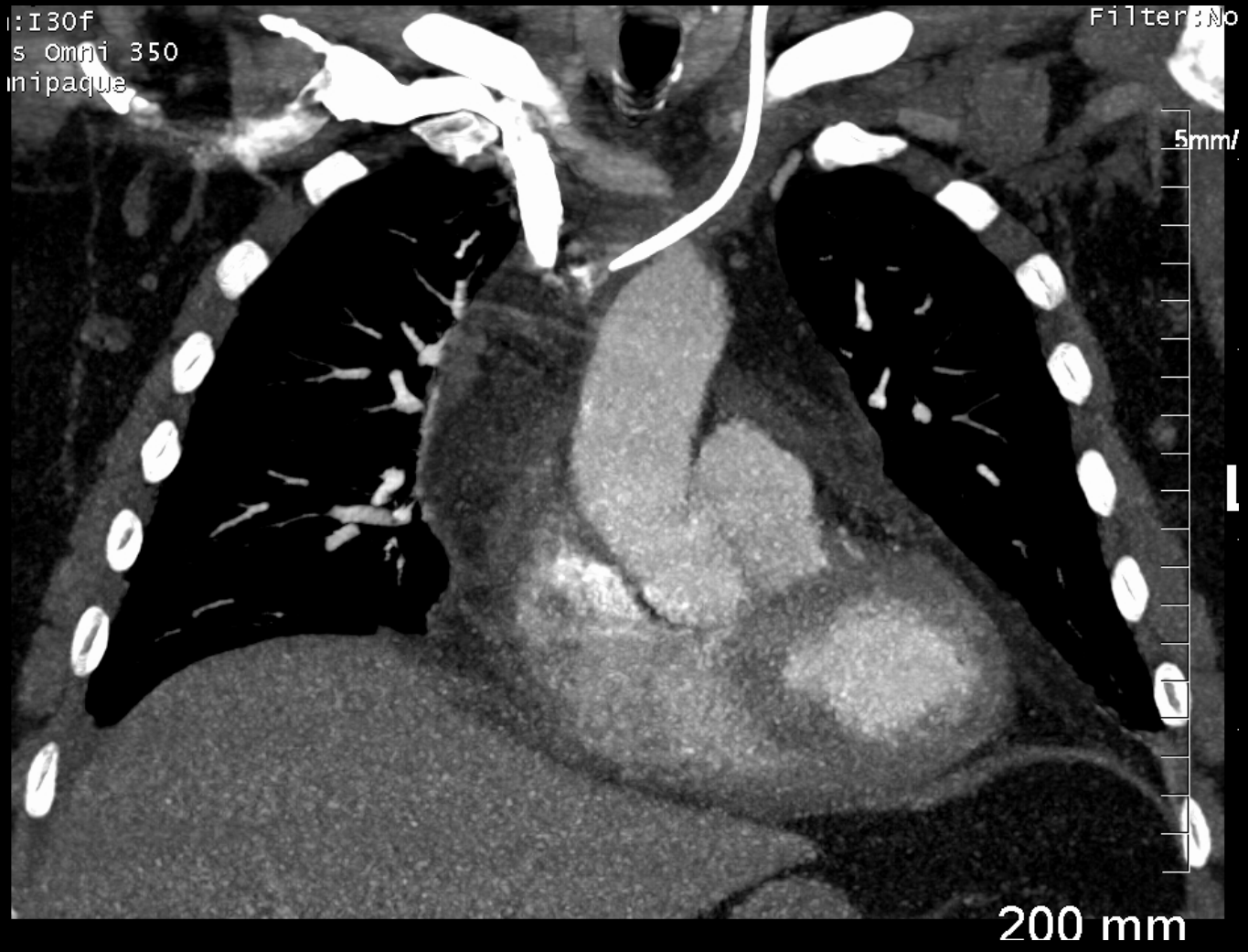

# RIGHT IC DRAIN INSERTED

2.5L of white “milky” fluid drained, identical in appearance to total parenteral nutrition

# CORONAL IMAGE CT PA DEMONSTRATING TIP OF LEFT IJV LINE OUTSIDE VESSEL LUMEN



# MAXIMUM INTENSITY PROJECTION IMAGE DEMONSTRATING THE COURSE OF THE LEFT IJV CATHETER



# TIP OF LEFT IJV LINE OUTSIDE VESSEL LUMEN IN SUPERIOR MEDIASTINUM, ANTERIOR TO LEFT BRACHIOCEPHALIC VEIN

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- CVC was removed, the patient was brought to ICU and intubated due to increased work of breathing
- A second left-sided chest drain was inserted
- Antimicrobials escalated to Meropenem and Anidulafungin on the advice of microbiology
- Adequate lung re-expansion was achieved with bilateral chest drains, and thoracoscopy with washout was not required
- The patient was successfully extubated 2 days later and continued to progress on ward level care.
- He was discharged home 09/06 with oral antimicrobials and has had no further respiratory issues

# DISCUSSION

- Total parenteral nutrition is frequently given in the perioperative period via a central venous catheter
- CVCs are known to have early complications such as pneumothorax, gas embolism or accidental arterial puncture. Vascular erosion is a late and rare complication of CVC placement, with a high risk of mortality.
- Delayed vascular injury can be caused by chemical irritation of the hyperosmolar solution against the vessel intima or mechanical friction of the catheter tip against the vessel wall. The position of the catheter tip may change with respiration, neck movements and blood flow.
- Limited studies have shown left-sided CVCs are at a higher risk of erosion as compared to those on the right, likely due to the acute angle at which they abut the SVC wall.
- Migration of CVC tip secondary to vascular erosion can often present with respiratory symptoms mistakenly ascribed to pneumonia, fluid overload or a pulmonary embolism.
- In this case, initial analysis of CT images failed to comment on the position of the CVC tip. Post insertion of the chest drain, CVC migration was seen on imaging and vascular erosion was suspected.
- A high index of suspicion of vascular erosion should be maintained in all patients with respiratory symptoms and left-sided CVCs.

# REFERENCES


- Duntley P, Siever J, Korwes ML, Harpel K, Heffner JE. Vascular erosion by central venous catheters. Clinical features and outcome. Chest. 1992 Jun;101(6):1633-8
- Walshe C, Phelan D, Bourke J, Buggy D. Vascular erosion by central venous catheters used for total parenteral nutrition. Intensive Care Med. 2007 Mar;33(3):534-7
- Quillen K, Magarace L, Flanagan J, Berkman EM. Vascular erosion caused by a double-lumen central venous catheter during therapeutic plasma exchange. Transfusion. 1995 Jun;35(6):510-2