

DOUBLE TROUBLE: UNEXPECTED DOUBLE SUPERIOR VENA CAVA FOLLOWING LEFT INTERNAL JUGULAR CENTRAL VENOUS CATHETER INSERTION

DR CLAIRE FORAN, DR RITA AGARWALA | KING'S COLLEGE HOSPITAL, LONDON

BACKGROUND

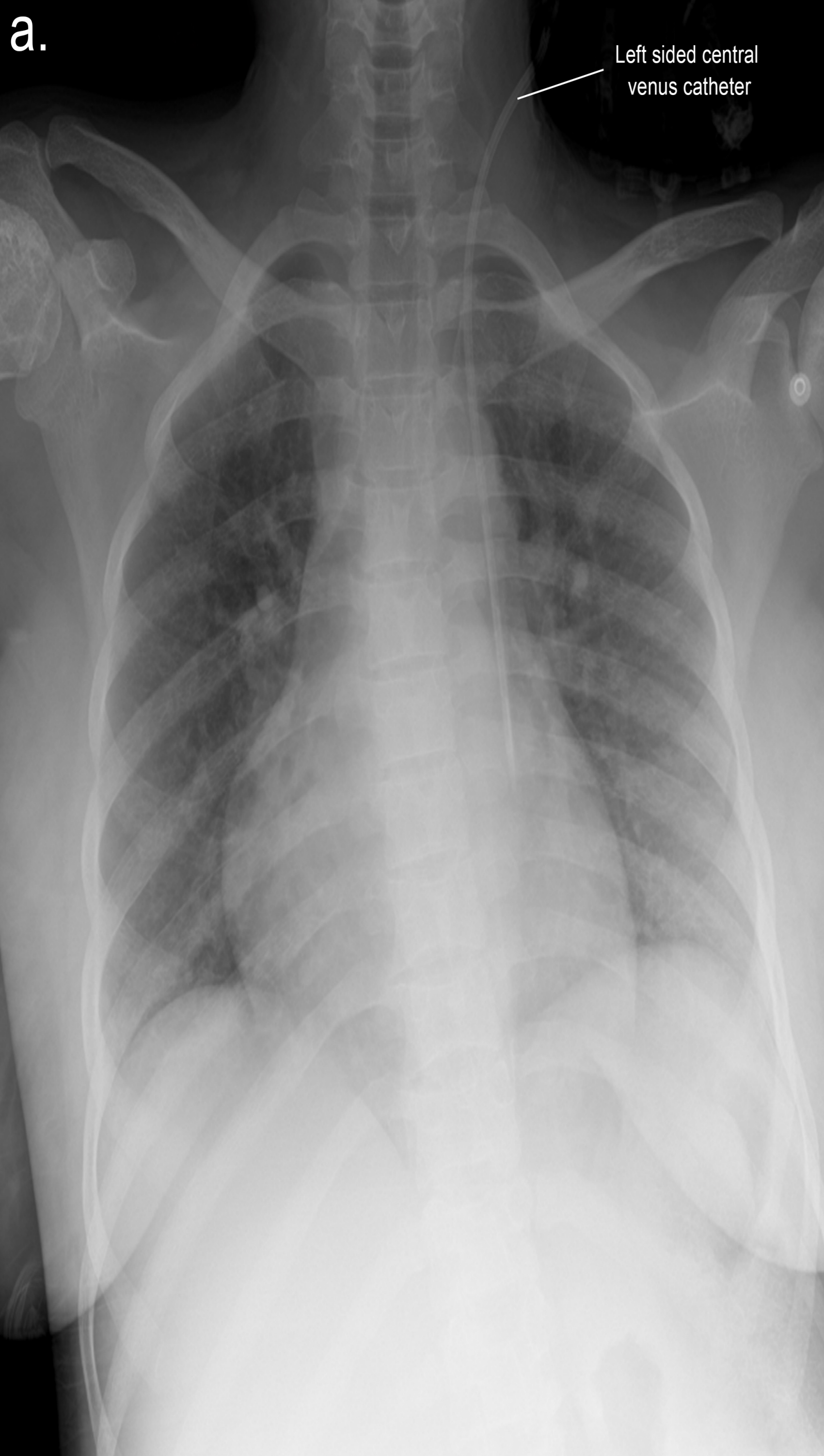
- Persistent left-sided superior vena cava (**PLSVC** or '**double**' **SVC**) is the most common thoracic venous congenital anomaly.
- It occurs in **~0.3%** of the general population and up to **10-11%** of patients with congenital heart disease.
- Usually **asymptomatic**, but can result in **atypical jugular and mediastinal venous drainage**.
- **Right SVC** is often **smaller** in these cases due to **redistribution of venous return**.
- Drainage patterns:
 - ~80% → Right atrium
 - ~20% → Left atrium (causing **right to left shunt**)
- May present as an **unexpected catheter course on imaging** following central venous access.

CASE SUMMARY

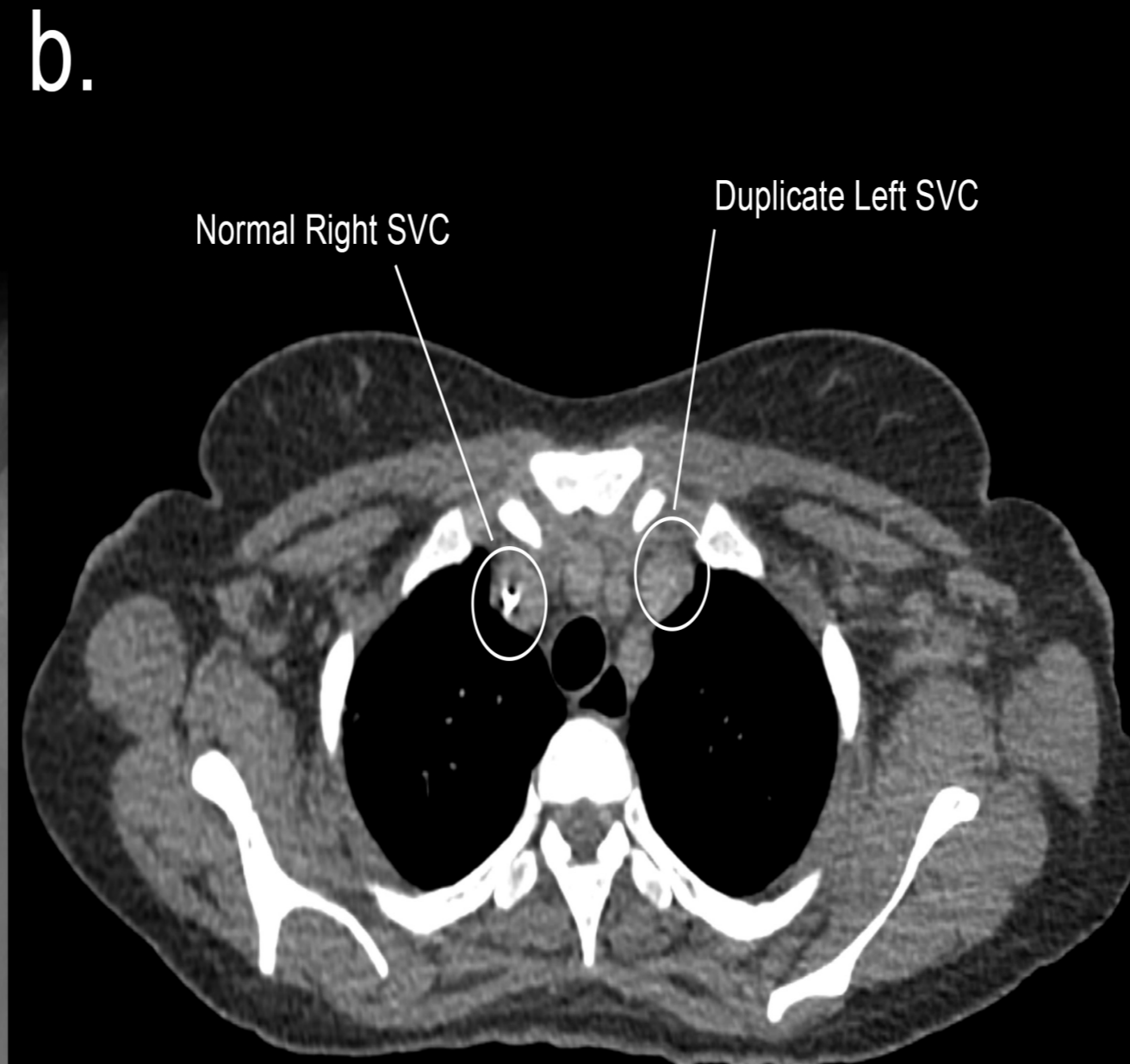
A 30-year-old **pregnant** female with sickle cell disease presented in an acute vaso-occlusive crisis, requiring reliable intravenous access for patient-controlled analgesia, phlebotomy and medication administration. Due to difficult peripheral venous access, central venous cannulation (**CVC**) was performed. The left internal jugular vein was accessed due to patient preference. A post-procedure chest radiograph demonstrated an **unusual course** for a left-sided catheter, **not crossing the midline to the right SVC**.

Venous blood gas sampling (sO₂ 65.5%) and pressure waveform analysis (though atypical) confirmed venous placement.

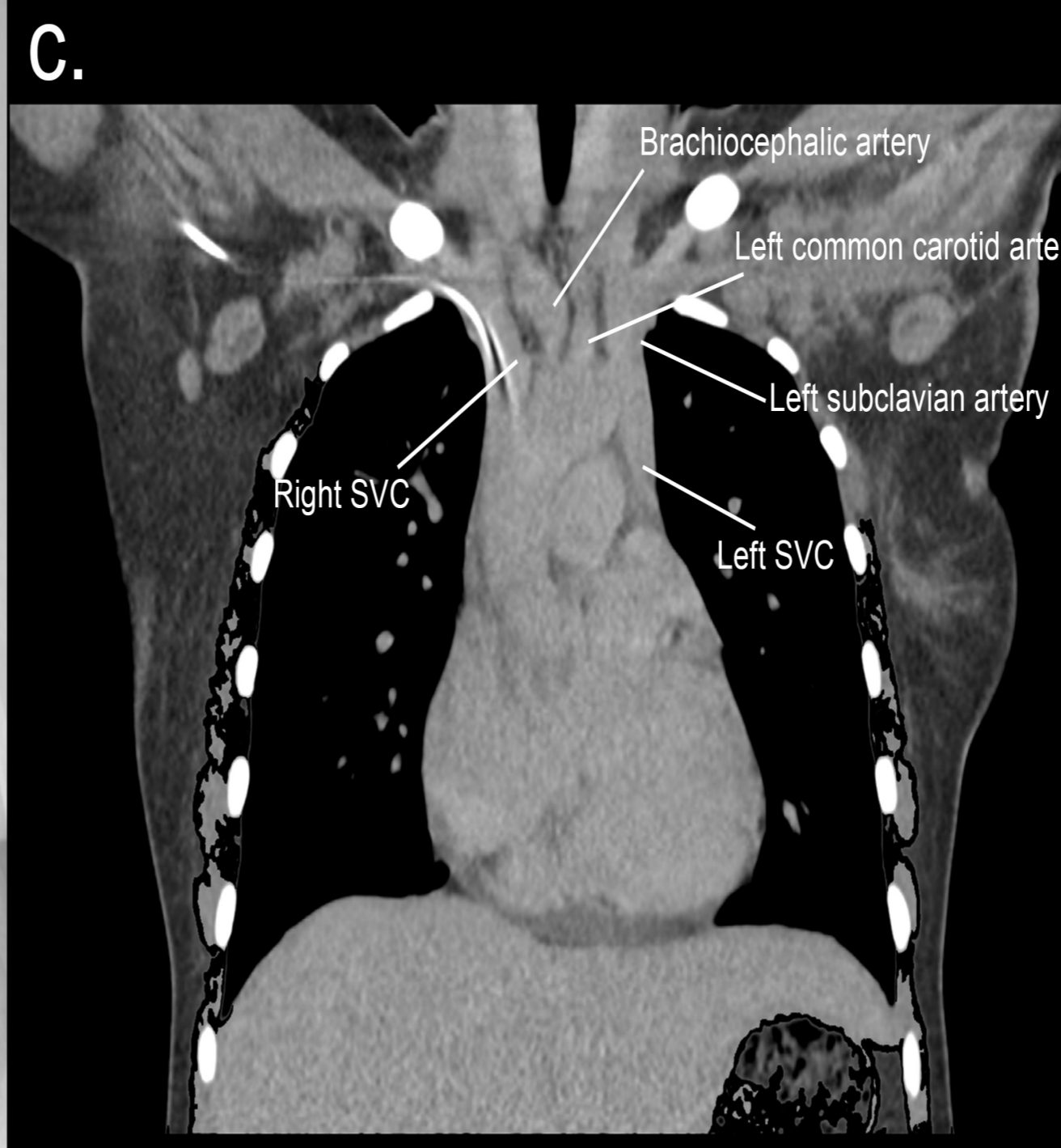
Radiology consultation was sought, and review of prior **CT venography** from the referring hospital revealed a **duplicated SVC**. The patient's left internal jugular and subclavian veins formed a left brachiocephalic vein that did not cross the midline, instead descended **vertically along the left mediastinum** as a **PLSVC**. This vessel coursed adjacent to the **left atrium** before ultimately draining into the **inferior portion of the right atrium**, near the junction with the inferior vena cava. The anatomical findings were **communicated to interventional radiology** in anticipation of insertion of a tunnelled Hickman line.



(a) Post-procedural chest radiograph demonstrating a central venous catheter inserted via the left internal jugular vein. Instead of crossing the midline toward the normal right-sided superior vena cava, the catheter follows a vertical course along the left mediastinum, raising concern for possible malposition or vascular anomaly.



(b) Coronal reconstruction from prior CT venography confirming duplication of the superior vena cava.



(c) CT venogram illustrating double superior vena cava, with a persistent left SVC that does not cross the midline and instead descends vertically parallel to the aortic arch and its branches.

LEARNING POINTS

1. **PLSVC** should be considered when a central line follows a **vertical left mediastinal course on chest X-ray**.
2. **Blood gas analysis** and **waveform tracing** can help confirm venous cannulation and **unnecessary removal of lines**.
3. **Review prior imaging** if available and consider **CT venogram** for **diagnosis** and to **assess venous drainage patterns**.
4. Awareness and clear **documentation** of thoracic venous anomalies are essential for **safe future vascular access** procedures.

REFERENCES

- Kellman GM et al. Radiographics. 1988.
- Demos TC et al. AJR Am J Roentgenol. 2004.
- Albay S et al. Morphologie. 2006.



King's College Hospital
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