

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

### Surgery Quiz – Case 19

A 64-year-old male patient with end-stage renal failure due to IgA nephropathy was submitted to permanent hemodialysis catheter placement without ultrasound and fluoroscopy guidance. Intraoperative technical details included: (a) The right internal jugular vein could not be located; (b) the right subclavian vein was easily located, but the guide wire could not be advanced; (c) the left internal jugular vein could not be located; and (d) the left subclavian vein was easily located, the guide wire was smoothly advanced and the tunneled catheter was successfully placed. On plain chest radiograph (fig. 1), the catheter was demonstrated to project at left paramediastinal position.

Where was the catheter?

- (a) At the persistent left superior vena cava
- (b) At the left internal thoracic or left superior intercostal or accessory hemiazygos vein
- (c) At the descending aorta
- (d) At the mediastinum



**Figure 1.** Plain chest radiograph showing the catheter at left paramediastinal position.

ARCHIVES OF HELLENIC MEDICINE 2019, 36(3):427–428  
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2019, 36(3):427–428

**K. Blouhos,  
K. Boulas,  
A. Paraskeva,  
A. Triantafyllidis,  
A. Hatzigeorgiadis**

*Department of General Surgery, General Hospital of Drama, Drama, Greece*

#### Comment

*Left-sided superior vena cava (SVC) is the most common congenital venous anomaly of the chest. Left-sided SVC is seen in 0.3–0.5% of normal population and in 5% of congenital heart disease patients. In the vast majority of cases, left-sided SVC is accompanied by a normal smaller-diameter right-sided SVC and a bridging left brachiocephalic vein, termed SVC duplication. However, it may be accompanied by an obliterated right-sided SVC, termed duplicated persistent left SVC. Left-sided SVC forms when the left anterior cardinal vein is not obliterated during normal fetal development. Left-sided SVC passes lateral to the aortic arch and anterior to the left hilum before draining into coronary sinus or left atrium in 92% and 8% of cases, respectively. Congenital heart anomalies are present in 4.4% of patients with left-sided SVC, such as most commonly atrial septal defect, single atrium, ventricular septal defect, tetralogy of Fallot, coarctation of the aorta, pulmonary stenosis, anomalous pulmonary venous return.*

*Diagnosis is typically made incidentally during computed tomography (CT) of chest or central venous catheter misplacement. The presence of left-sided SVC is implied when left paramediastinal catheter position is demonstrated on plain chest radiograph. In such cases, differential diagnosis includes abnormal position of the catheter into the left internal thoracic vein, left superior intercostal vein, left pericardiophrenic vein, accessory hemiazygos vein, left subclavian artery, descending aorta, mediastinum, and pleural space. When the catheter is identified at left paramediastinal position, contrast enhanced CT is needed to clarify the venous anomaly, the course of the vein and the drainage site. Left-sided SVC is usually asymptomatic. Symptoms may be caused due to (a) arrhythmias; and (b) right to left shunt when the drainage site is the left atrium, which is usually not large enough to be symptomatic. In the setting of permanent hemodialysis catheter placement, identification of the left-sided SCV drainage site is extremely important as drainage at the left atrium could lead to systemic embolism and clinically significant right to left shunt.*

*In the present patient, the permanent hemodialysis catheter was placed without ultrasound and fluoroscopy guidance. Based on technical details (the right subclavian vein was easily located but the guide wire could not be advanced, the left subclavian vein*

was easily located and the guide wire was smoothly advanced) and radiograph findings (catheter at left paramediastinal position) the catheter supposed to be placed in the persistent left-sided SCV with a concurrent obliterated right sided-SVC. Chest CT angiography confirmed the diagnosis and demonstrated (fig. 2): (a) The obliterated



**Figure 2.** Computed tomography (CT) of the chest showing the catheter at the persistent left-sided superior vena cava (SVC) draining at the right atrium with the catheter's tip inside it.

right-sided SVC; (b) the course of the left-sided SCV lateral to the aortic arch and anterior to the left hilum; (c) the drainage site at the right atrium; and (d) the presence of the catheter into the persistent left-sided SVC with its tip into the right atrium. In analogous cases, the crucial question is whether the catheter can be used for dialysis access. The answer depends on the drainage site of the left-sided SVC and the location of the catheter's tip. When the drainage site is at the right atrium with the tip of the catheter inside it, the catheter can be safely used. When the drainage site is at the left atrium, the catheter should be removed due to the risk of systemic embolism.

## References

1. BOODHUN M, MOHAMMAD N, ADNAN A, WAN GHAZALI WS. Catheterisation of a persistent left superior vena cava. *BMJ Case Rep* 2018;2018; pii: bcr-2018-224355
2. BALASUBRAMANIAN S, GUPTA S, NICHOLLS M, LABOI P. Rare complication of a dialysis catheter insertion. *Clin Kidney J* 2014, 7:194–196

*Corresponding author:*

K. Boulas, Department of General Surgery, General Hospital of Drama, Drama, Greece  
e-mail: boulaskonstantinos@gmail.com