

Persistent Left Superior Vena Cava in Hematological Malignancy Requiring Central Venous Catheter Insertion for Intensive Chemotherapy

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Key Words

Persistent left superior vena cava · Coronary sinus atresia · Central venous catheter · Chemotherapy · Hematological malignancy

Abstract

Persistent left superior vena cava is a congenital vascular anomaly, which is possibly arrhythmogenic and thrombogenic, rarely complicated with coronary sinus atresia. We treated a 42-year-old male with Hodgkin's lymphoma requiring central venous catheter placement for intensive chemotherapy. Persistent left superior vena cava was revealed after the insertion of the central venous catheter by the radiological finding of the catheter tip cannulated into the vena cava cavity. The relationship between coronary sinus atresia and persistent left superior vena cava induced by central venous catheterization remains unclear; however, the hematologist should pay attention to the malpositioning of the central venous catheter.

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Background

Persistent left superior vena cava (PLSVC) is a congenital but benign vascular anomaly [1] with a prevalence of 0.3–0.5% in the general population [2, 3]. PLSVC is one of the most

common cardiovascular anomalies but is generally asymptomatic, and it is thus often identified accidentally during cardiovascular ultrasound/CT scan screening or coronary interventional angiography [4]. Anatomically, PLSVC causes the aberrant backflow vein to drain into the retrograde positioned coronary sinus [5].

Some researchers have called attention to the risk of atresia of the coronary sinus among the anomalies associated with PLSVC [4, 6], but there are no recommendations regarding anticoagulation therapy for patients with PLSVC. Some anecdotal case reports describe PLSVC-associated arrhythmia such as atrial fibrillation [7, 8]. Accordingly, PLSVC is understood as possibly arrhythmogenic. Nevertheless, coronary sinus atresia (CSA) due to PLSVC is a rare complication.

In patients with hematological malignancies, the insertion of a central venous catheter (CVC) is required for the patient to undergo intensive chemotherapy. Hematologists must make a decision whether to conduct a CVC insertion for patients with a given complication. What if the patient has a cardiac abnormality, e.g., PLSVC? There are a few reports of CSA in PLSVC induced by central venous catheterization [5], pacemaker wire placement, or cardiac surgery [9]. The placement of a CVC might evoke arrhythmia due to an additive enhancement of the patient's arrhythmogenic condition. Considering such a situation, it may not be advisable to insert a CVC in a PLSVC patient with a hematological malignancy.

Case Presentation

We treated a 42-year-old male with stage IV Hodgkin's lymphoma with bone marrow involvement. The initial chemotherapy (ABVd, doxorubicin 25 mg/m², bleomycin 9 mg/m², vinblastine 6 mg/m², and dacarbazine 250 mg/m², day 1 and 15) was effective, resulting in complete remission after 6 cycles of ABVd. However, after 15 months he relapsed. Although the ABVd chemotherapy had been administered via a peripheral vein, salvage chemotherapy was initiated via an implantable venous access port catheter because his peripheral blood accesses were ultimately unusable. He received an indwelling port catheter from the left subclavian vein, since the right subclavian approach was not possible. The port catheter happened to be cannulated PLSVC (fig. 1a), which was found at the time for the first time in his life.

The patient successfully completed a total of 3 courses of salvage chemotherapy constructed with AraC, carboplatin, etoposide, and methylpredonisolone (ACES). Although obstruction of the coronary venous drainage caused by PLSVC has been suggested, it is not always thrombogenic [10]. The formation of a thrombus may depend on the PLSVC flow. A small PLSVC flow can easily connect to hemostasis of the venous circulation return. In our patient, the PLSVC cavity had enough space for a port catheter to be cannulated and positioned (fig. 1b). Ideally the back flow and diameter of the PLSVC to the coronary sinus should be evaluated by cardiovascular ultrasound or cardiography [11].

Conclusions

Although PLSVC is a rare congenital anomaly, some risks including thrombosis and occlusion should be annotated when the patient receives a CVC insertion. The relationship between CSA and PLSVC remains unclear; however, the hematologist should pay attention to the malpositioning of the CVC tip.

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Statement of Ethics

Informed consent to participate in the study was obtained from the participant. Written informed consent was obtained from the patient for publication of this case series and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Disclosure Statement

The authors declare that they have no competing interests.

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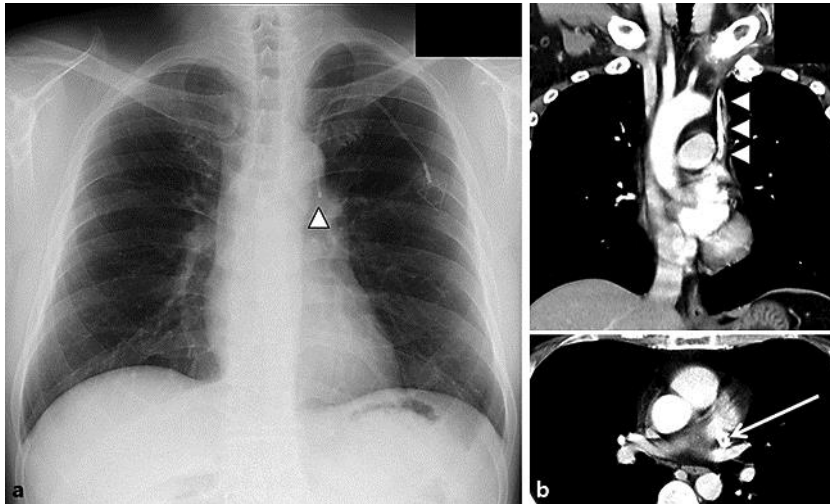


Fig. 1. **a** The patient's chest X-ray indicated the positioning of the catheter tip in the left mediastinum (arrowhead), suggesting that the catheter was aberrantly placed (i.e., not into the normal insertion site, the right-sided superior vena cava). **b** CT scan depicting an indwelling venous catheter port placed into the PLSVC (arrowhead): coronal (top) and transverse view (bottom).