

INADVERTENT PORT CATHETERIZATION INTO ABERRANT THORACIC VEIN: A CASE REPORT

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PATIENT AND OBSERVATION

A 70-year-old female diagnosed with right breast cancer. Postoperative systemic chemotherapy is planned. She placed an totally implantable venous access ports (TIVAP) at our hospital in September 23rd 2021. The left internal jugular vein was selected as the puncture path under routine ultrasound guidance. The initial depth of catheter placement is 13-14cm. During the operation, the push injection was smooth but blood return was slow. After adjusting depth to 11-12cm, the catheter function recovered well. She took Chest X-ray after 1 hour (Fig. 1). The result showed the end of catheter was located at the left margin of thoracic vertebra 6th. Then we found dysfunction of the catheter, difficultly in injection and suction. The patient did not have chest tightness and pain. We considered the abnormal position of the catheter tip, it was not at the opening of the superior vena cava of the right atrium. The catheter tip was successfully adjusted under digital subtraction angiography (DSA). The contrast medium extended downward along the catheter on the left side of the spine during the operation (Fig. 2). The contrast medium was injected into the small transverse branch on the right side at the level of the 6th-7th thoracic vertebra approximately. There was no obvious contrast medium filling below this level. The catheter was located in the superior vena cava at the opening of the right atrium finally. The patient can use the port for follow-up chemotherapy.



Figure 1: Chest X-ray: The report shows the end of catheter is located at the left margin of sixth thoracic vertebra.

The unusual situation of the catheter tip may be the new variation of the left brachiocephalic vein or superior vena cava. Meanwhile, double superior vena cava may not be excluded in this case. The diameter of the variation vein was small, which was easy to cause the catheter to adhere to the wall and dysfunction, pneumothorax, hemopneumothorax, damage of vessel, aeroembolism, etc.

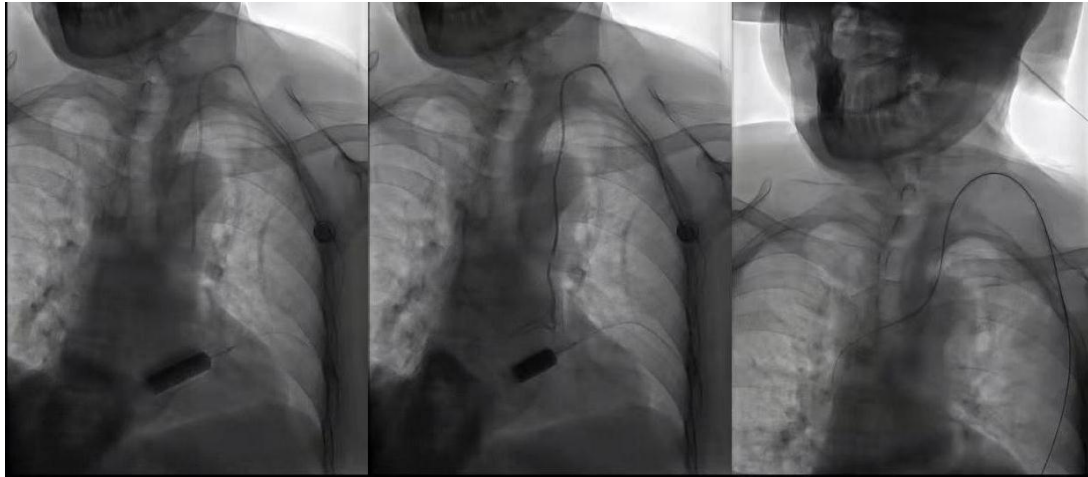


Figure 2: DSA: The catheter tip is at the opening of the superior vena cava of the right atrium.

SUMMARY

TIVAP is used as an infusion tool for chemotherapy in malignant patients. The incidence of catheter dysfunction related to TIVAP is about 9.87%-26%, mainly manifested as easy to inject but difficult or unable to pull back.^[1] It may be caused by the misplacement of catheter tip into variation of intrathoracic veins. The most common variation of intrathoracic veins is the persistent left superior vena cava (PLSVC). The incidence of PLSVC is 0.3%-0.5% in the normal people and about 10% in the patients with congenital heart disease.^[2] PLSVC can be divided into three types: inflow into coronary sinus (type1), inflow into left atrial (type2) and inflow into right atrial (type3).^[3] The most common type is the type1. In this case, the possibility of the left superior vena cava flowing into the coronary sinus is not excluded yet. The incidence of left brachiocephalic vein variation is next only to azygos vein anomaly and PLSVC in the congenital variation of thoracic venous system.^[4] Sometimes abnormal brachiocephalic veins are difficult to distinguish from PLSVC. The cause of its mutation is related to the inferior degeneration of the left superior vena cava during embryonic development.^[5] In this case, the following condition could also be considered: the left brachiocephalic vein runs downward, branching to the right roughly at the level of the fourth thoracic vertebra, flowing into the right superior vena cava and returning to the right atrium. The left brachiocephalic vein continues downward and gives off the accessory hemiazygos vein, which also gives off small branches at the level of the seventh thoracic vertebra. This case shows that when vascular interventional surgery encounters obstacles, it is necessary to find out the causes in combination with relevant radiography. Imaging may suggest unconventional vascular variation. The appropriate position of the catheter tip can be ensured by using transesophageal or thoracic echocardiography, digital subtraction angiography, atrial electrocardiogram and B-ultrasound-guided puncture.

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