



## Persistent Left Sided Superior Vena Cava Found Incidentally on Central Line Insertion

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**Abstract** Persistent Left Sided Superior Vena Cava (PLSVC) is a rare vascular anomaly however it is the most common venous anomaly of the thoracic venous system. It is present in 0.3 to 0.5% of the population [1, 2]. PLSVC is the result of persistence of the embryonic left anterior cardinal vein and is usually considered a normal variant. In this case report, we present a case of persistent left sided SVC in a 64 year old man associated with anterior cerebral artery aneurysm.

**Keywords** Persistent Left Superior Vena Cava, Persistent LSVC, Anterior Cerebral Artery Aneurysm, Thoracic Vascular Anomalies.

### Introduction

Persistent LSVC was found incidentally during insertion of left sided internal jugular central line. Persistent LSVC is a rare vascular anomaly however; it is the most common venous anomaly of the thoracic venous system. It is present in 0.3 to 0.5 % of the population [1, 2]. Persistent LSVC is associated with congenital anomalies of the heart, great vessels, and cerebral vasculature [3].

We report a case of persistent left sided SVC associated with anterior cerebral artery aneurysm. To our knowledge, this is the first case that describes this association.

### Case report

64-year-old man presented to our hospital complaining of headache and left sided

weakness. His past medical history was significant for hypertension. Patient's symptoms started 12 hours before coming to the ED and worsened over time. Patient denied any history of fall or recent head trauma.

Patient had a CT scan of the head, which showed a large subarachnoid hemorrhage. Subsequent CTA showed 1.3 x 0.8 x 0.9 centimeters saccular lobulated aneurysm arising from a pericallosal branch of the anterior cerebral artery. The neck of the aneurysm was approximately 3mm in diameter. Patient went for transcatheter angiography of right and left internal carotid arteries and coil embolization of pericallosal aneurysm.

After surgery, patient remained intubated and was admitted to ICU. The patient had a right-sided internal jugular central line placed on post-operative day 1 for access and hemodynamic monitoring. On post-operative day 14, patient had several febrile episodes and leucocytosis. To rule out line infection, the right side central line had to be removed. Therefore, another central line was inserted on the contralateral internal jugular vein. A follow-up chest X-ray was

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**Figure 1: Chest roentgenogram A): Chest X-ray showing right and left Internal Jugular central lines with the left side central line in the left chest without crossing the midline. B) Chest X-ray showing the left side central line after removal of the right sided catheter (Red arrow).**

done for verification of line placement (Figure 1A, 1B). The catheter was noted to be in the left chest and not crossing the midline. This raised the question of whether the catheter was placed into the venous or the arterial system.

Blood gas measurements, taken from the line showed (pH: 7.35, PO<sub>2</sub>: 37, PCO<sub>2</sub>: 42, HCO<sub>3</sub>: 24) a gas equivalent to venous blood. We then connected the catheter to a transducer however; no arterial waveforms were noted. CT Chest from a previous admission (Figure 2A, 2B) was reviewed and showed an atretic left brachiocephalic vein with persistent left superior vena cava draining into the right atrium. The right-sided SVC was draining into the right atrium normally. Additionally, the patient was also found to have a tracheal bronchus supplying portions of the right upper lobe. This is also considered a rare anomaly of the bronchial tree.

## Discussion

Persistent LSVC is a rare vascular anomaly however, it is the most common venous anomaly of the thoracic venous system. The persistent left superior vena cava has been described as the most frequent variation in the central venous return and thorax venous

system. Persistent left superior vena cava may occur alone i.e. without a contralateral SVC or in combination with a right-sided SVC. Having bilateral SVCs occurs in 4.08% of the population (range 0.2–8%)[4]. Having a left SVC in the absence of a right superior vena cava is very rare with an estimated frequency of approximately 0.1%[4]. Usually the persistent LSVC drains via the coronary sinus into the right atrium but in rare cases it may drain into the left atrium creating a small right-to-left shunt.

PLSVC is the result of persistence of the embryonic left anterior cardinal vein and is usually considered a normal variant. One superior vena cava will be present on each side of the mediastinum with or without a rudimentary left innominate vein as a communication between the two.

Persistent LSVC is associated with other congenital cardiovascular abnormalities like atrial septal defects, endocardial cushion defects, tetralogy of Fallot, aortic coarctation, ventricular septal defects and transposition of great arteries[3]. This case describes an association between LSVC and cerebral vascular abnormalities namely the anterior cerebral artery aneurysm, which has been rarely described in the literature.

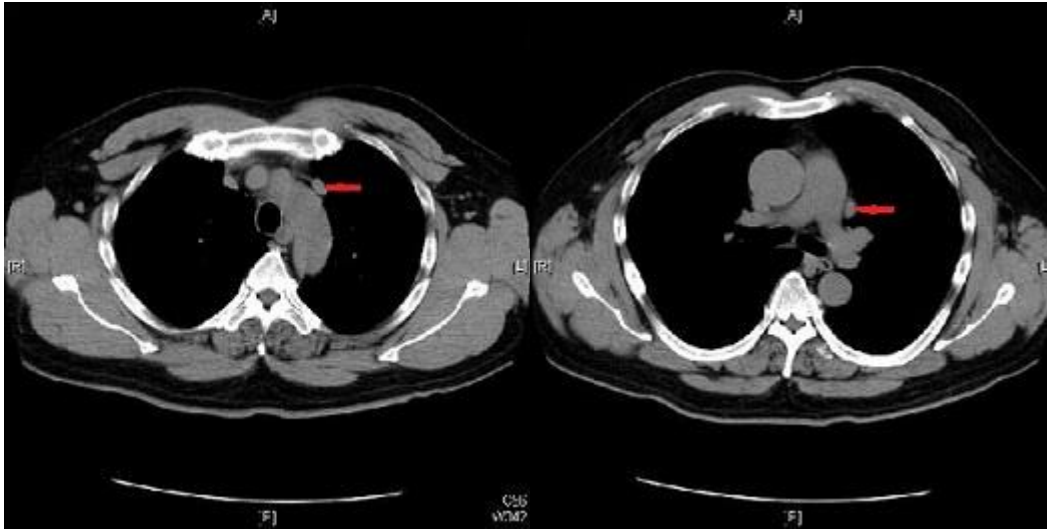


Figure 2: Figure 2: Computed Tomography A) CT Chest showing persistent Left SVC (Red arrow). B) CT Chest showing Persistent LSVC at a lower level in the chest (Red arrow)

Another interesting observation in this patient was the presence of the tracheal bronchus supplying portions of the right upper lobe. Tracheal bronchus is another normal variant of the tracheobronchial tree with prevalence of 0.1-3% [5].

Diagnosis of left SVC is usually made incidentally during placement of central venous catheter, pacemaker, implantable cardioverter defibrillator or during thoracic surgery. In this case the diagnosis was made after insertion of central line catheter. After obtaining a chest x-ray, abnormal course of the catheter was noted to go downwards instead of crossing the midline.

### Conclusions

Persistent LSVC is a rare vascular anomaly however; it is the most common venous anomaly of the thoracic venous system. Although it may be associated with cardiovascular anomalies, in this case it was associated with cerebrovascular aneurysm. Awareness of this anomaly may avoid the patient unnecessary interventions and investigations in the future. Clinicians should

also be aware of this variant when evaluating central venous line placement.

### Authors' Contributions

PA: Corresponding author: contribution to this study included Study design, collection of data, literature search, analysis of the data, writing and editing the final manuscript and supervision.

BH: contribution to this study included collection of data, literature search and writing the final manuscript.

KA: contribution to this study included Study design, literature search and supervision.

### Conflict of Interests

The authors declare that there are no conflicts of interests

### Ethical Consideration

The written informed consent was taken from the patient for publication of this case report.

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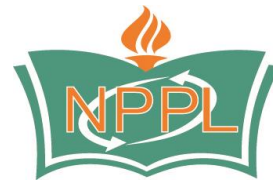
None declared

## References

1. Coblenz MG, Criscito MA, Cohn JD: Persistent left superior vena cava complicating hemodynamic monitoring catheterization. *Crit Care Med* 1978, 6:32-35.[[PubMed](#)]
2. Danielpour PJ, Aalberg JK, El-Ramey M, Sivina M, Wodnicki H: Persistent left superior vena cava: an incidental finding during central venous catheterization-a case report. *Vasc Endovascular Surg*2005, 39:109-111.[[PubMed](#)]
3. Goyal SK, Punnam SR, Verma G, Ruberg FL: Persistent left superior vena cava: a case report and review of literature. *Cardiovascular ultrasound* 2008, 6:1-4.[[PubMed](#)]
4. Tobias JD, Russo P: Anesthetic care during modified fontan procedure without cardiopulmonary bypass. *J Cardiothorac Vasc Anesth*2005, 19:612-619.[[PubMed](#)]
5. Bakir B, Terzibasoglu E: Images in clinical medicine. Tracheal bronchus. *N Engl J Med* 2007, 357:1744.[[PubMed](#)]



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