

A rare case of persistent left superior vena cava discovered during an intracardiac echocardiography procedure

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INTRODUCTION

- Isolated persistent left superior vena cava (PLSVC).
- PLSVC with an absent right superior vena cava (RSVC), also called isolated PLSVC, is very uncommon, occurring in 0.07 to 0.13% of patients who have congenital heart defects with viscerio-atrial situs solitus.
- Nearly half of the patients with isolated PLSVC have other cardiac malformations, such as atrial septal defect, endocardial cushion defect or tetralogy of Fallot.
- Rarely, the right SVC may be missing. Here, we discuss a rare case of PLSVC found incidentally in a patient with paroxysmal atrial fibrillation (PAF).

CASE PRESENTATION

- A 63-year-old female patient with a history of Paroxysmal Atrial flutter (AFL) and atrial fibrillation (AF) on apixaban, HTN, and HLD was brought to the electrophysiology lab for electrophysiology study (EPS) and AF/AFL ablation due to recurrent symptomatic episodes of AF and AFL despite being on antiarrhythmic medications.

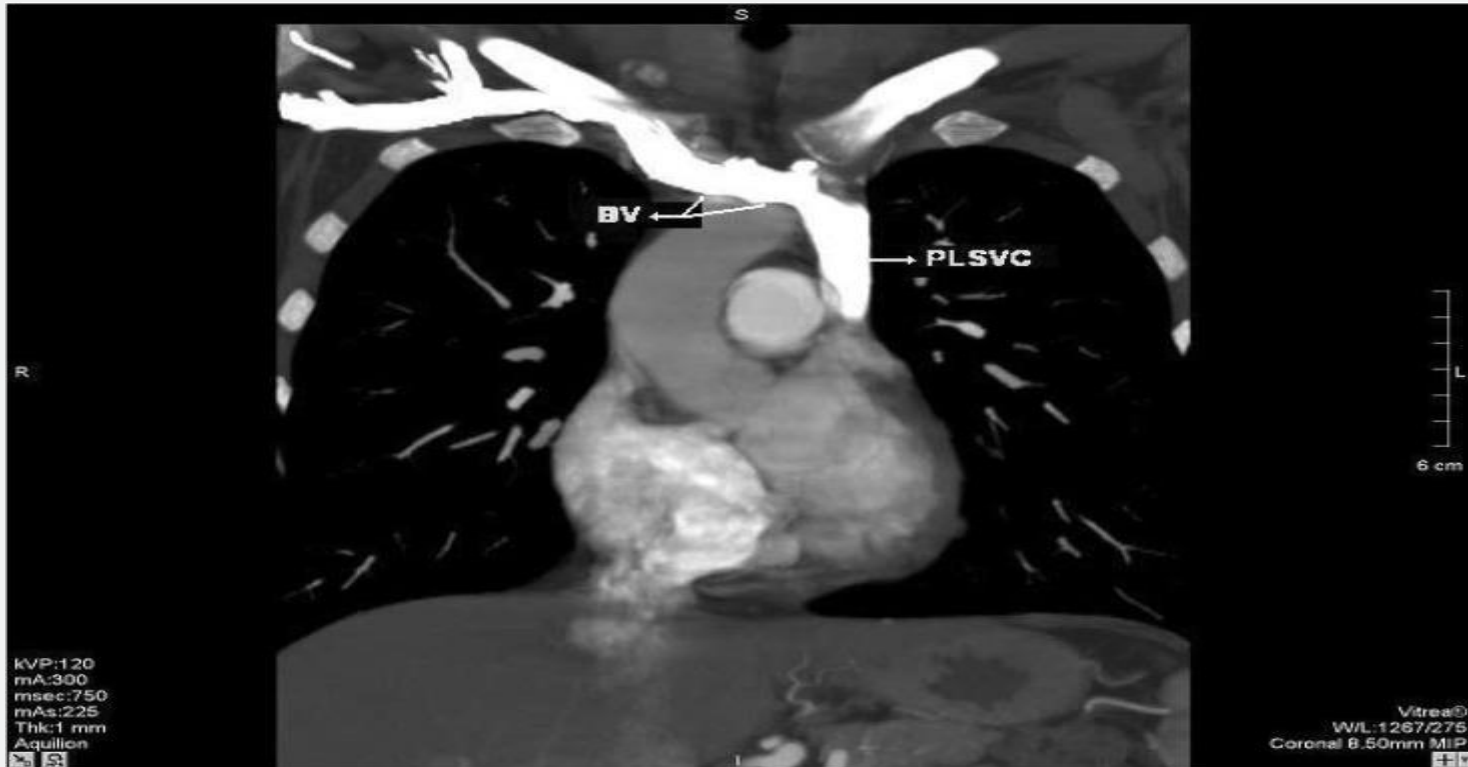
CASE PRESENTATION (CONTINUED)



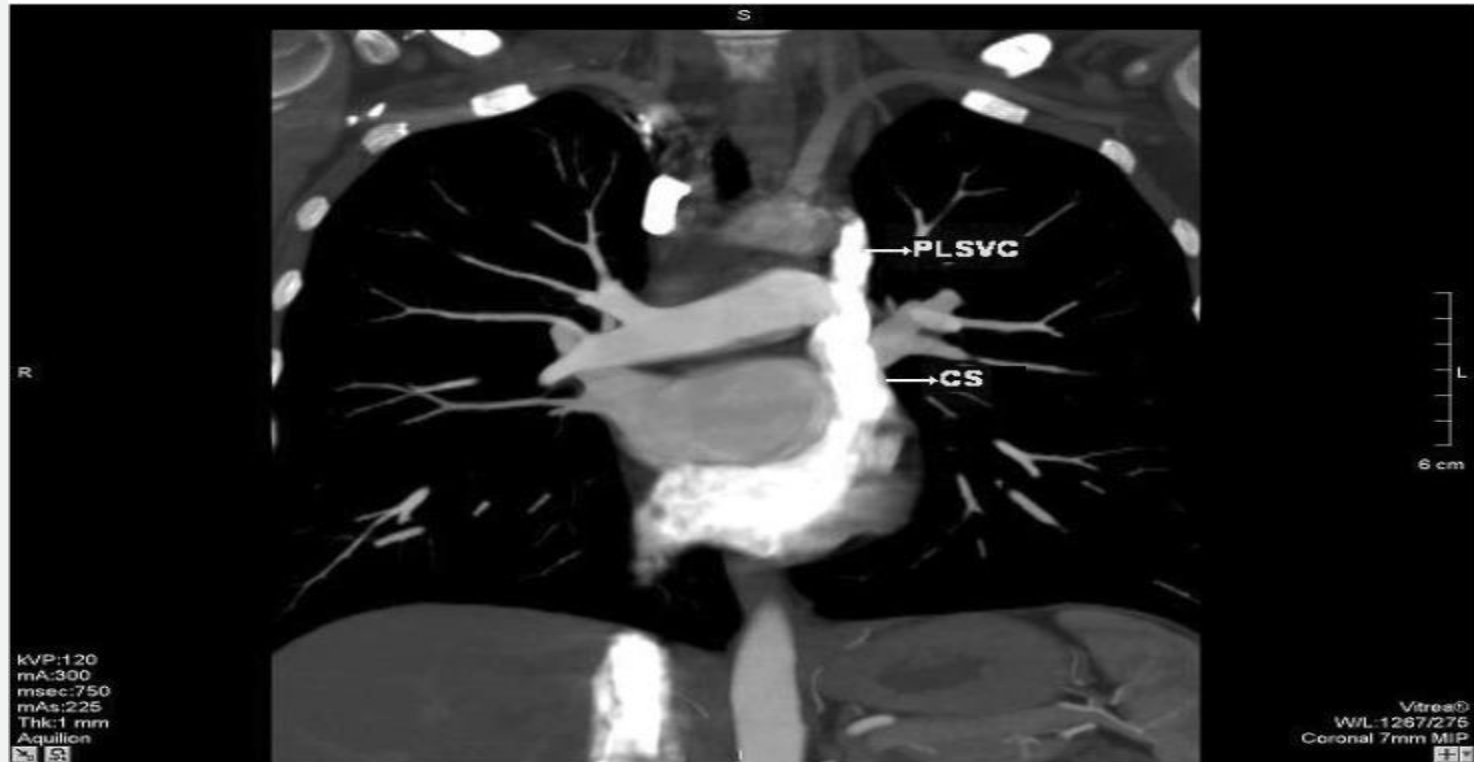
- Pre-ablation CT was not performed as the patient's baseline creatinine was 1.4 mg/dl.

DISCUSSION

- After the placement of venous access sheaths, intracardiac echocardiogram (ICE) was advanced and ICE imaging was performed.
- No right-sided SVC was identifiable with the inability to visualize superior aspect of interatrial septum and pulmonary veins.
- Large coronary sinus was noted.



Multiplanar reformatted image demonstrates that the right superior vena cava is absent and a bridging vein (BV) drains the right jugular and subclavian veins, which then join with the left brachiocephalic vein to form the persistent left superior vena cava (PLSVC).



Multiplanar reformatted image reveals the persistent left superior vena cava (PLSVC) draining into a dilated coronary sinus (CS).

DISCUSSION (CONTINUED)



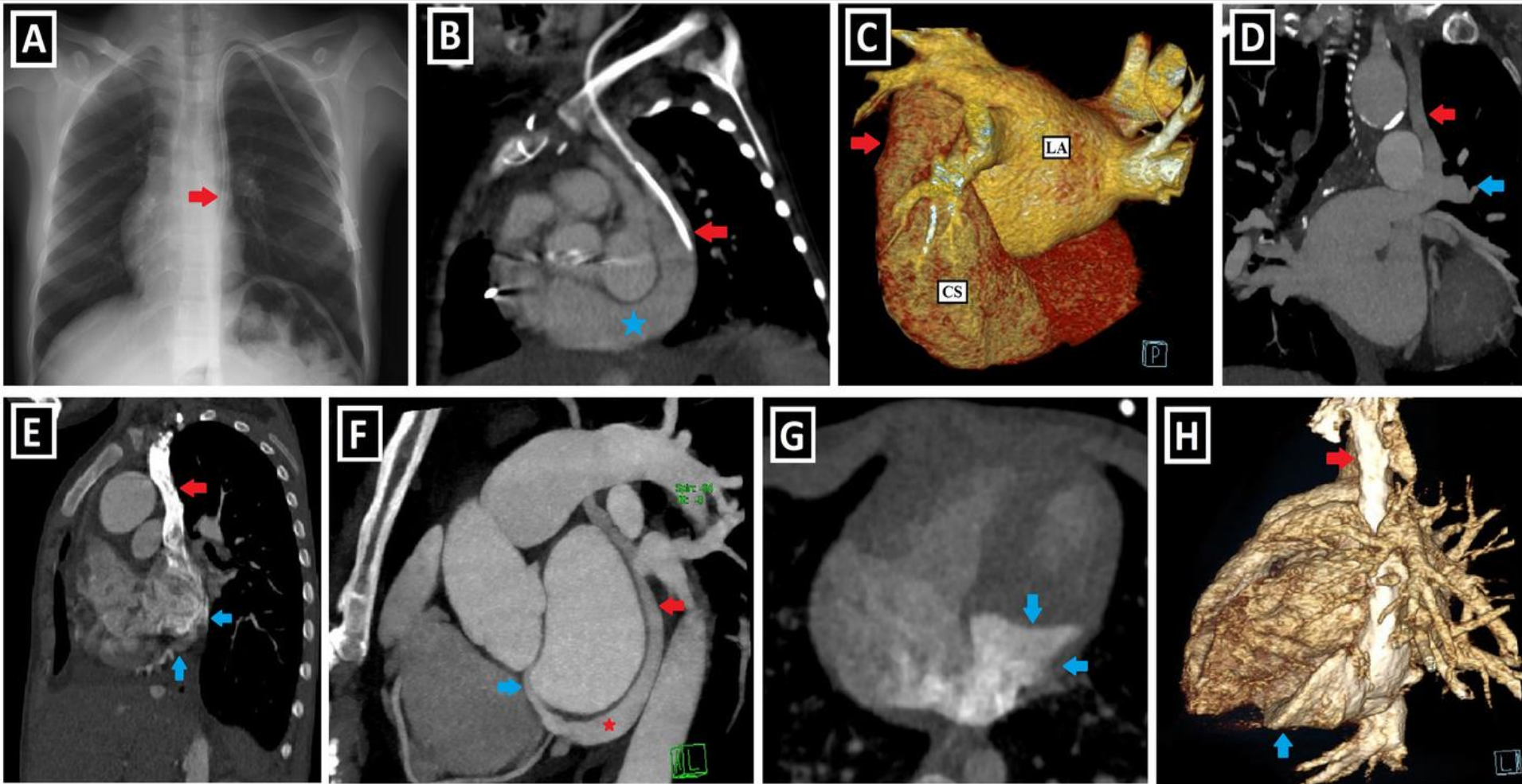
- Additionally, we were unable to advance the guidewire into the SVC.
- Due to abnormal cardiac anatomy and the inability to perform a trans-septal puncture, AF ablation was not performed.
- The patient's repeat creatinine was 1.2 mg/dl, and a CT chest was performed, confirming the absence of right-sided SVC and the presence of PLSVC. Patient was discharged on Dofetilide for rhythm management.

CONCLUSION

- During the normal cardiac development, the left-sided anterior venous cardinal system vanishes.
- However, the left SVC persists when the left anterior cardinal vein is unable to close.
- The left SVC almost always empties into the right atrium via an expanded coronary sinus.
- Rarely, the persistent left SVC can reach the left atrium directly, which can cause a partial anomalous systemic venous return.
- Abnormality of the SVC has implications for electrophysiology procedures and ICE/CT and cMRI imaging are helpful in delineating the anatomy.

CONCLUSION (CONTINUED)

- A PLSVC can cause problems during central venous catheterization (access to the CS can cause hypotension, angina, perforation of the heart, tamponade and arrest), pacemaker implantation (due to the circuitous path taken by the electrode, it can be difficult to obtain a stable electrode position and sustained capture),-or cardiopulmonary bypass.
- In addition, a higher incidence of arrhythmias and conduction system abnormalities has been described in patients with PLSVC.
- There are two proposed mechanisms for this association:
 - a dilated CS stretches the atrioventricular nodal tissue, which prepares a substrate for re-entrant tachycardias or the early conduction tissue has close proximity to the cardinal venous tissue and this leads to sinus node dysfunction.



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Thank
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