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A Rare Levoatrial Cardinal Vein Connecting the Left Inferior Pulmonary Vein to the Inferior Vena Cava

E-PAGE ORIGINAL IMAGE

A 59-year-old woman presented with chest tightness for 2 weeks. Physical examination revealed a grade 2/6 ejection systolic murmur best heard in the second and third left intercostal spaces. Laboratory tests revealed significantly elevated levels of NT-proBNP 8590 pg/mL (reference range <125 pg/mL). Transthoracic echocardiography showed a bicuspid aortic valve with severe stenosis; left ventricular (LV) dilatation and LV systolic dysfunction with ejection fraction value of 32%. The maximum intensity projection of computed tomography angiography (CTA) and image showed a levoatrial cardinal vein (LACV) connecting the left inferior pulmonary vein (LIPV) to the inferior vena cava (IVC) (Figure 1A and B).

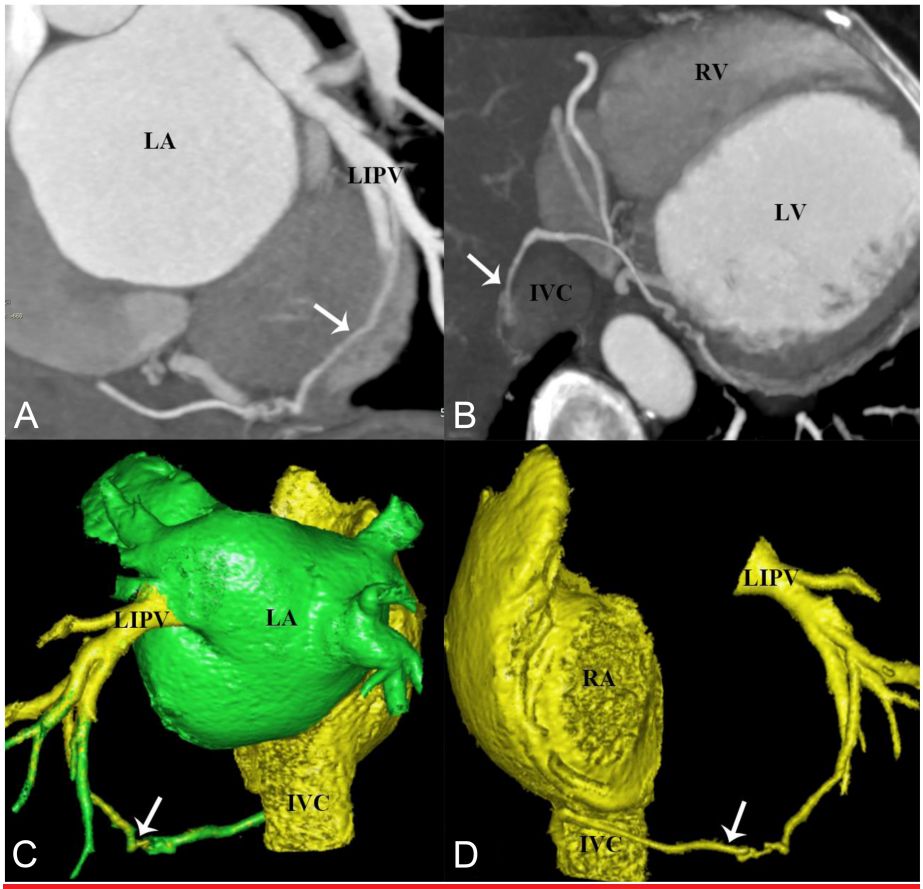


Figure 1. The maximum intensity projection of CTA and image shows a LACV connecting the LIPV to the inferior vena cava (IVC). (C and D) The VR CTA image intuitively shows an anomalous venous channel connecting the LIPV to the IVC. CTA, computed tomography angiography; IVC, inferior vena cava; LA, left atrium; LACV, levoatrial cardinal vein; LIPV, left inferior pulmonary vein; LV, left ventricle; RA, right atrium; RV, right ventricle.

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The volume-rendered (VR) CTA image intuitively showed an anomalous venous channel connecting the LIPV to the IVC (Figure 1C and D). The patient had successful surgical aortic valve replacement and ligation of the LACV. The postoperative course was uneventful and discharged after 7 days. At follow-up at 6 months, she had significant symptomatic relief and a satisfactory recovery of cardiac function.

The LACV may also be called a pulmonary-to-systemic venous connection, which is a very rare but clinically important intrathoracic venous collateral pathway between the pulmonary and systemic venous circulations.[1] It is usually associated with mitral or aortic atresia, aortic stenosis, left ventricular dysplasia syndrome, cor triatriatum, etc.[2] Levoatrial cardinal vein usually act as left-to-right shunt with cranially directed flow and decompresses the left atrium in cases of left-sided obstruction. However, some cases are with bidirectional flow causing paradoxical embolization.[3] Levoatrial cardinal vein needed to be differentiated from other more common anomalies, such as anomalous pulmonary venous return, persistent left superior vena cava, and dilated left superior intercostal vein.[4] The LACV connecting the LIPV to the IVC is extremely rare entity. It is important to detect and report LACV as this may require catheter intervention or surgical correction along with other defects.[5] The authors' case highlights that CTA plays an important role in showing the origin, course, and drainage site of the LACV.

Informed Consent: The informed consent was obtained from the patient for this study.

Declaration of Interests: The authors have no conflicts of interest to declare.

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