Incidentally Diagnosed Double Inferior Vena Cava While Being Investigated for Pulmonary Hypertension

A 57-year-old male was admitted with exertional dyspnea. Transesophageal echocardiography revealed a large sinus venosus-type atrial septal defect (ASD). During right heart catheterization, we encountered difficulty when we directed the catheter into the superior vena cava (SVC). We tried to figure out what the problem was by pulling back the catheter and giving it a little amount of opaque. We observed that there was a duplication of the inferior vena cava (DIVC) (Video 1). An abdominal computed tomography scan showed DIVC below the renal veins. Both inferior vena cava (IVC) were formed from the respective common iliac veins and ran upwards bilaterally to the renal veins. The hepatic veins drained into a stump of the hepatic segment of the IVC, which opened cranially into the right atrium and caudally drained into the right renal vein, at the confluence with the right IVC. The left IVC once receiving the left renal vein crossed posterior to the aorta to join the right IVC and continued cephalad as the azygos vein, and the azygos vein finally drained into the normal right superior vena cava and the right atrium (Figure 1A-1D, Videos 2, 3).

Duplication of the inferior vena cava is a rare anomaly with a prevalence of 0.2-3%. Duplication of the inferior vena cava is generally asymptomatic and diagnosed incidentally. Although DIVC may be sometimes associated with congenital heart disease, there is no descriptive case report showing the coexistence of DIVC and ASD. Duplication of the inferior vena cava is classified into 5 subtypes (types 2a-2e) based on how the interiliac communications are formed. Our case appears to be compatible with type 2c. Clinical outcome is good if recognized before invasive procedures, otherwise, complications can be fatal.

Informed Consent: Informed consent was obtained from the patient for this manuscript.

Video 1: During right heart catheterization, giving a little amount of opaque by pulling back the catheter revealed the presence of DIVC. DIVC, duplication of the inferior vena cava.

Video 2: Imaging with the opaque giving through SVC.

Video 3: Imaging with the opaque giving through the azygos vein.
Figure 1. Coronal computed tomography views show DIVC below the renal veins and interiliac communications (A). The left IVC, after draining the left renal vein, crossed posterior to the aorta to join the right IVC and continued cephalad as the azygos vein (B). Sagittal computed tomography view shows azygos vein finally drained into the normal right superior vena cava and the right atrium (C). Schematic anatomy of our patient (D). DIVC, duplication of the inferior vena cava; IVC, inferior vena cava.