A PERSISTENT LEFT SUPERIOR VENA CAVA

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ABSTRACT

Persistent left superior vena cava (PLSVC) is a congenital anomaly of great thoracic vessels with an estimated incidence of 0.3-0.5% in the normal population. The anomaly is incidentally encountered on cross sectional imaging for another indication or during intravenous catheterization or placement of pacemaker or defibrillator leads.
A rare case of persistent left superior vena cava draining into the right atrium through the coronary sinus is presented with a discussion of the embryology, morphologic forms, and clinical significance of the persistent left superior vena cava.

Introduction

Persistent left superior vena cava (PLSVC) is a congenital anomaly of great thoracic vessels with an estimated incidence of 0.3-0.5% in the normal population.[1,2,3]
Prevalence of PLSVC is higher (4.4%) among those with congenital heart disease.[4]
In 80 to 90% of cases the persistent left superior vena cava drains into the coronary sinus and right atrium.[5]
Patients with such manifestation are typically asymptomatic as the anomaly is hemodynamically insignificant.[6]
The anomaly is incidentally encountered on cross sectional imaging for another indication or during intravenous catheterization or placement of pacemaker or defibrillator leads.
On chest radiograph a catheter in left sided SVC is seen passing down along the left mediastinal border. Mostly it is confused with other intravascular and extra vascular malpositioned catheters.[5,7,8]
This form of anomaly is not associated with increased risks of complications with a right to left shunt such as embolic cerebrovascular events.
A rare case of persistent left superior vena cava draining into the right atrium through the coronary sinus is presented with a discussion of the embryology, morphologic forms, and clinical significance of the persistent left superior vena cava.

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Case Report

This is a case report of a 52 years-old male without previous cardiovascular disease who was admitted to the intensive care unit with chronic renal failure.
Interventional radiology was consulted to rule out central venous stenosis. Venogram was carried after cannulation of right cephalic vein which revealed significant narrowing in right distal subclavian vein with cut-off in brachiocephalic vein. Few collaterals were identified in the neck. No flow was seen in superior vena cava.
Later on the patient was planned for angioplasty of the right central venous stenosis.
This time venogram was carried out from dialysis catheter placed in left jugular vein to assess status of superior vena cava. The venogram demonstrated left-sided superior vena cava which was draining into coronary sinus. Since the previous right upper limb venogram was suggestive of complete occlusion of right brachiocephalic vein, and the chances of negotiating the stenosed segment from right arm

approach was very minimal therefore left femoral vein was punctured and using hydrophilic guide wire and 5 Fr H1 catheter, an attempt was made to cross the occluded segment but there was no communication between right atrium and right superior vena cava.

Figure 1: Venogram showing a persistent left superior vena cava draining into the right atrium.

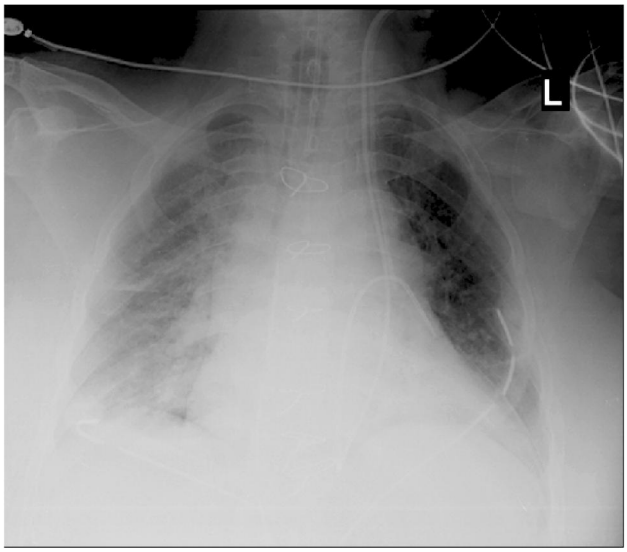

Figure 2: Central venous line placed in persistent left superior vena cava

Discussion

Occurring in 80 to 90% of cases, the most common manifestation of the persistent left superior vena cava demonstrates drainage into the right atrium through the coronary sinus. The anomaly develops in the eighth week of gestation as the main venous drainage system of the embryo's body develops. Paired anterior cardinal veins drain the cranial portions of the body while the caudal portions of the body are drained by the paired posterior cardinal veins. The right anterior and posterior cardinal veins and the left anterior and posterior cardinal veins drain into the right and left common cardinal veins, respectively. At eight weeks of gestation the inomminate vein connects the left and right anterior cardinal veins. The internal jugular veins develop from the anterior cardinal veins cephalic to the inomminate vein. Caudal to the inomminate vein, the right anterior cardinal vein joins with a portion of the right common cardinal vein to form the normal right-sided superior vena cava. The left anterior cardinal vein, caudal to the inomminate vein, normally regresses to form the ligament of Marshall. Failure of the left anterior cardinal vein to regress caudal to the inomminate vein results in the development of a persistent left superior vena cava. A normal right superior vena cava is present in 90% of cases where a persistent left superior vena cava is present. A bridging inomminate vein connecting the vena cavae is present in 30% of these cases.[9]

Although the common form of persistent left superior vena cava is not associated with the risks inherent with a right to left shunt, there are other important clinical implications to consider in patients with a persistent left superior vena cava. Catheterization of the coronary sinus through a persistent left superior vena cava is 4.8 times more likely to cause supra-ventricular tachycardia than catheterization through a right superior vena cava.[10]

Atrial fibrillation and sudden death can occur in patients with persistent left superior vena cava owing to repetitive rapid discharges and shorter activation cycle length from the multiple anatomical and electrical communications with the atria.[5] In patients with coronary sinus ostial atresia, severe myocardial ischemia can occur if there is interruption of the persistent left superior vena cava during cardiac surgery.[10]

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