Unusual Course of a Swan-Ganz Catheter*

James R. Yarnal, D.O.;** William H. Smiley, III, D.O.;† and
David A. Schwartz, D.O.‡

A 62-year-old woman was admitted to the coronary care unit with a diagnosis of acute anteroseptal myocardial infarction. She subsequently developed bilateral femoral artery embolism and embolectomy was performed. She later became hypotensive. A No. 7 French triple-lumen thermistor-tipped Swan-Ganz catheter was inserted without difficulty via a left antecubital vein cutdown. Figure 1 is from a portable chest roentgenogram obtained soon thereafter.

*From the Detroit Osteopathic Hospital, Detroit.
**Resident, Department of Medicine.
†Department of Cardiology.
‡Department of Cardiology; Assistant Clinical Professor of Medicine, Michigan State University, College of Osteopathic Medicine, Lansing.
**Diagnosis: Persistent left superior vena cava (SVC)**

The portable AP roentgenogram (Fig 1) shows mild cardiac enlargement and the presence of two intravascular catheters. The tip of the right-sided catheter lies in the region of the right SVC. The other catheter (retouched) passes from the left arm to the left of the mediastinum, and then into the heart, terminating in the left main pulmonary artery. To confirm the position of this catheter, about 7 ml of contrast material was hand injected through the catheter (Fig 2). This confirms that the catheter tip is in the left main pulmonary artery. Figure 3, an AP angiogram obtained after partial withdrawal of the catheter, shows contrast medium in the left SVC entering the coronary sinus and then draining into the right atrium. Contrast material in the right ventricle accounts for the background opacity; the pulmonary arteries can be faintly visualized superiorly.

In the investigation of suspected cardiovascular anomalies, a persistent left SVC is encountered frequently. In a coronary care unit, where much of the bedside right heart catheterization and pacemaker insertions are done without fluoroscopic guidance, this anomalous vessel may create problems. Manipulation of an intravascular catheter or pacemaker wire may be extremely difficult through a persistent left SVC and coronary sinus, and may produce more frequent cardiac dysrhythmias from vagal stimulation.\(^1\) In a series of patients being evaluated for congenital or acquired cardiac lesions, Cha and Khoury\(^6\) found the incidence of a persistent left SVC to be 4.4 percent, whereas the incidence in one autopsy series was only 0.28 percent.\(^7\)

A persistent left SVC is embryologically derived from the remnants of the left cardinal vein system. The anterior and posterior cardinal veins join to form the common cardinal veins (ducts of Cuvier) which drain medially into the sinus venosus. The left common cardinal vein disappears and the sinus venosus becomes the coronary sinus and drains into the right atrium. Persistence of the left common cardinal vein results in the presence of a left-sided SVC which descends vertically along the left paramediastinum anterior to the aortic arch, slightly to the left of the left vagus nerve. The relationship of this vessel to the hilar structures varies, but it usually lies anterior to the pulmonary vessels.\(^1,2,6\)

A persistent left SVC is thought to be the most common type of anomalous venous drainage.\(^6\) It may be an isolated anomaly or be associated with other congenital lesions, especially atrial septal defect\(^8\) or absence of the right SVC.\(^1\)

A persistent left SVC may be suspected clinically by the presence of abnormal left jugular venous pulsations.\(^9\) This sign was absent in our patient. The PA chest roentgenogram may also suggest the diagnosis by demonstrating a strip of lessened density along the upper left cardiovascular border (paramediastinal crescent), a paramediastinal bulge below the aortic knob, a crescentic vascular shadow passing from the middle third of the left clavicle to the left upper border of the aortic arch, and widening of the aortic shadow or vascular pedicle.

**REFERENCES**

1 Winter FS: Persistent left superior vena cava. Survey of world literature and report of thirty additional cases. Angiology 5:90-132, 1954
4 Miller G, Inmon TW, Pollock BE: Persistent left superior
6 Cha EM, Khoury GH: Persistent left superior vena cava, radiologic and clinical significance. Radiology 103:375-381, 1972
9 Colman AL: Diagnosis of left superior vena cava by clinical inspection, a new physical sign. Am Heart J 73:115-120, 1967

36th Annual Congress, College of Allergists

The 36th Annual Congress of the American College of Allergists will be held January 19-23 at the Americana Hotel, Bal Harbour, Miami Beach. For further information, write or call Frances P. White, American College of Allergists, 2141 14th Street, Boulder, Colorado 80302.