

Cardiovascular Imaging In-a-Month

●Loud Harsh Holosystolic Murmur in a Middle-Aged Man

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CASE

A previously asymptomatic 38-year-old man was admitted to a hospital because of a low grade fever lasting for 2 months. The patient suffered dyspnea and a heart murmur was first noticed. He was referred to us for evaluation of the low grade fever and the heart murmur. Physical examination demonstrated a loud harsh holosystolic and an early diastolic murmur in the third intercostal space of the left sternal border. Laboratory tests showed increased C-reactive protein level and white blood cell count. Several blood cultures revealed no growth of any organisms. Twelve-lead electrocardiography showed sinus tachycardia with no particular abnormal findings. Transthoracic echocardiography showed aortic regurgitation and systolic shunt flow to the right atrium from around the aortic area. Transesophageal echocardiography was performed (Fig. 1).

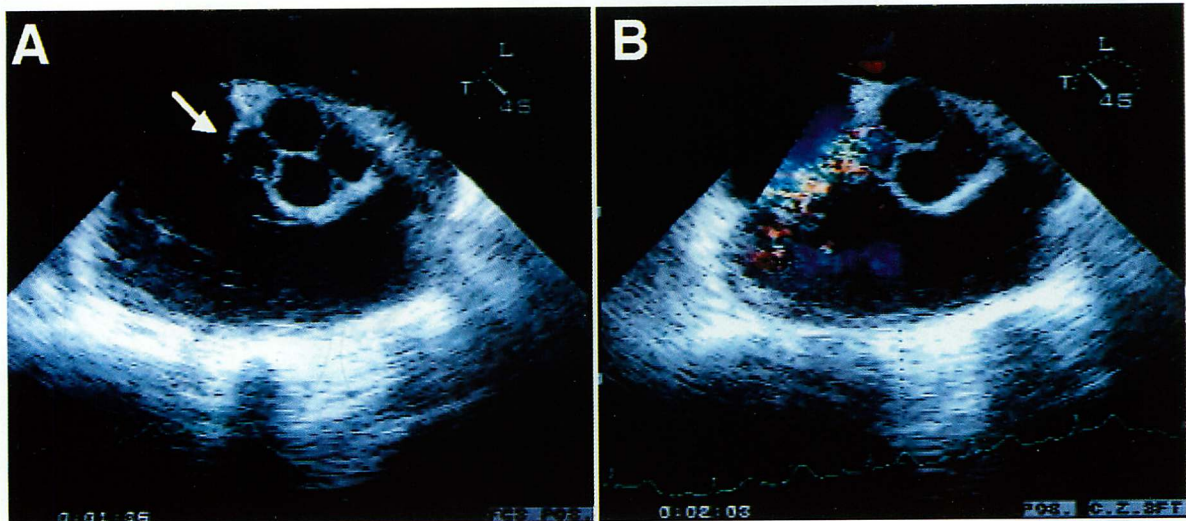


Fig. 1

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Points for Diagnosis

Transesophageal echocardiography showed aortic regurgitation and a lumen-like structure in the transverse view at the sinus of Valsalva level (Fig. 1-A; arrow). The lumen was surrounded by the right atrium (RA) and non-coronary and right coronary cusps, resulting in a four-leaf clover. The lower portion of the lumen communicated with the left ventricle (LV) and appeared to protrude from the LV to the RA similar to the structure of atrio-ventricular membranous septal aneurysm (Fig. 2-A). Slow display of color-Doppler echocardiography showed shunt flow from the LV to the RA throughout systole (Figs. 1-B, 2-B). Cardiac

catheterization demonstrated significant O₂ step-up at the mid-portion of the RA, and the pulmonary to systemic flow ratio was 1.8. Left ventriculography showed systolic shunt flow to the RA. Aortography showed aortic regurgitation (grade II). In the present patient, transesophageal echocardiography was very useful to establish the diagnosis of LV-RA communication. The patient underwent radical operation, and the diagnosis of "LV-RA communication" (supravalvular type) was confirmed. After patch closure, no loud harsh holosystolic murmur was heard and the patient is presently doing well.

LV-RA communication is uncommon¹⁾. The

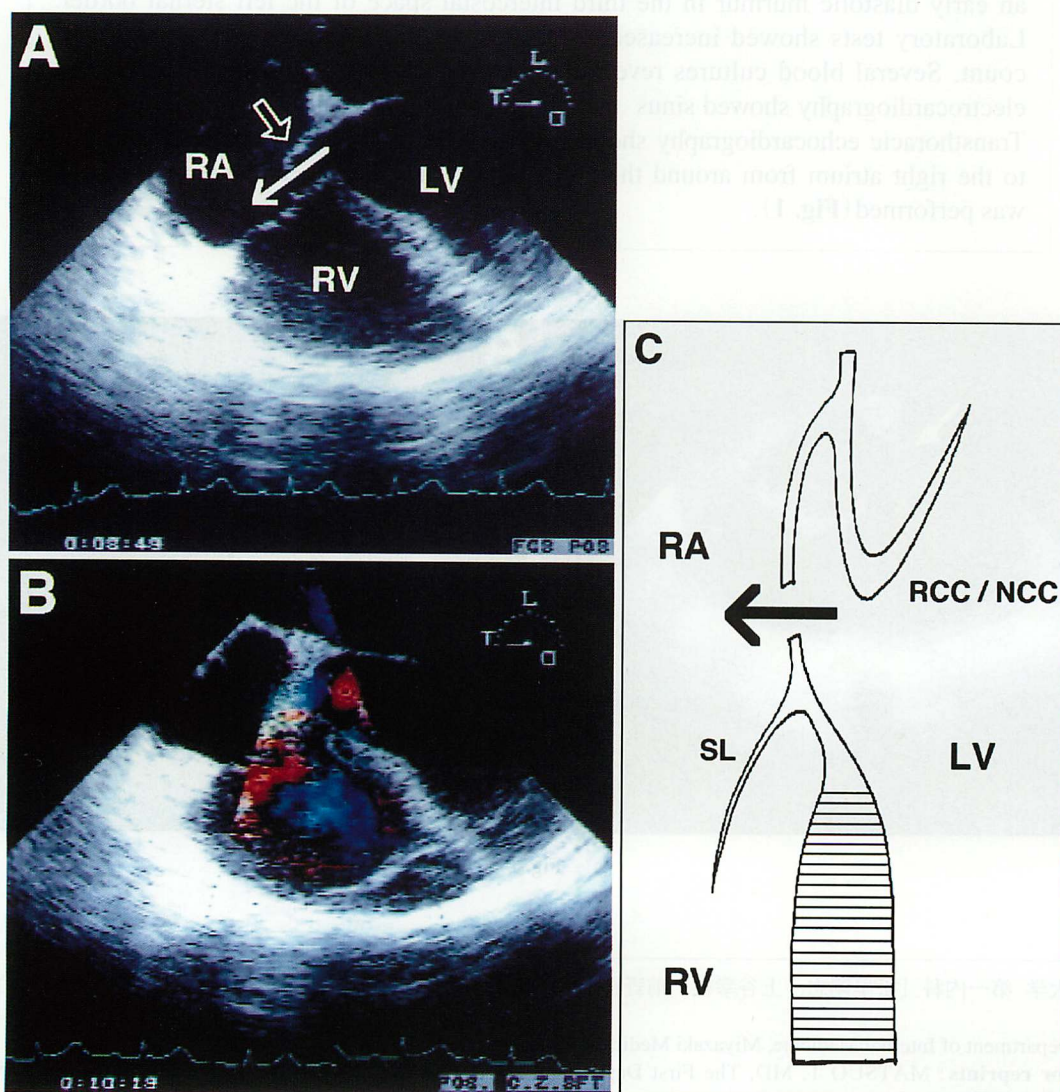


Fig. 2

prevalence is estimated to be less than 1% of all patients with congenital heart disease. The major etiology of LV-RA communication is congenital, but chest trauma²⁾, infective endocarditis³⁾ and valve replacement⁴⁾ are etiological factors in some patients. The etiology of LV-RA communication in the present patient was not confirmed but could be secondary to infective endocarditis, since no significant heart murmur was previously noted and he had been asymptomatic before the development of fever.

Diagnosis: Left ventricular-right atrial communication through the atrioventricular membranous septal aneurysm

References

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Fig. 1 Transesophageal echocardiography in the transverse view at the sinus of Valsalva level (A) and color-Doppler image (B)

Fig. 2 Transesophageal echocardiography in the transverse view at the lower portion of the sinus of Valsalva (A), color-Doppler image (B), and schematic illustration (C)

Closed arrow shows shunt flow and open arrow shows atrioventricular membranous septal aneurysm. RA = right atrium; LV = left ventricle; RV = right ventricle; SL = septal leaflet of the tricuspid valve; RCC/NCC = right coronary cusp or non-coronary cusp of the aortic valve.