

The Significance of Ventricular Septal Flattening in Patients with Suspected Pulmonary Hypertension and Preserved Left Ventricular Function

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Background:

Long-standing pulmonary arterial hypertension (PAH) may result in right ventricular strain that is manifested echocardiographically by ventricular septal flattening (VSF). We aimed to evaluate the significance of VSF in patients evaluated hemodynamically for PAH.

Methods:

We retrospectively collected data of patients referred to cardiac catheterization due to suspected PAH. All patients underwent baseline rest echocardiography. Baseline demographics, laboratory tests, pulmonary function tests, and echocardiographic and hemodynamic parameters were carefully collected for each patient with and without VSF. VSF was defined as septal flattening, septal overload, and paradoxical movement of the septum.

Results:

150 patients were included in the study. VSF was present in 33 patients (22%). Patients with VSF were younger (58 vs. 65, $p=0.05$), and suffered more from chronic obstructive pulmonary disease (COPD) (39.4% vs. 21.4%, $p=0.035$), and pulmonary embolism (PE) (30.3% vs. 8.5%, $p<0.001$). By echocardiography, patients without VSF had higher LV mass (176gr vs. 146.8gr, $p=0.007$), left atrial enlargement (72.8% vs. 42.9%, $p=0.003$), and peak E wave (101.8 cm/sec vs. 81.1, $p=0.01$), all signs of left ventricular diastolic dysfunction. At cardiac catheterization, patients with VSF had higher mean pulmonary pressure (51.6 vs. 36.4, $p<0.001$), lower mean capillary wedge pressure (14.7 vs. 18.8, $p=0.017$), lower cardiac output (3.4 l/min vs. 4.7, $p<0.001$), and most importantly higher pulmonary vascular resistance (11 woods vs. 4.4, $p<0.001$). Final clinical diagnosis of non-cardiac PAH (primary, or secondary to COPD and PE) was made in 75.8% of patients with VSF as compared to 31.6% of patients without VSF ($p<0.001$).

Conclusions:

We show that VSF can identify patients with non-cardiac PAH and is a good marker for elevated pulmonary vascular resistance. Patients with VSF identified during echocardiography should be further evaluated for PAH.