Whole-heart magnetic resonance imaging of isolated subpulmonary stenosis associated with hypertrophic cardiomyopathy

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Whole-heart magnetic resonance imaging (MRI) was performed in a 59-year-old man who was referred to the department of cardiology because of effort dyspnea. Echocardiography revealed asymmetric hypertrophy of the interventricular septum (Figure 1; upper left panel). There was an obstruction of the right ventricular outflow tract during systole (Figure 1; arrow in upper right panel). Continuous wave

Figure 1

Figure 2

Doppler (Figure 1; lower panel) revealed a maximum velocity of 3.0 m/s, which corresponded to a pressure gradient of 36 mmHg within the right ventricular outflow tract. A whole-heart MRI from the short-axis view showed asymmetric hypertrophy of the interventricular septum, which protruded into the right ventricular outflow tract (Figure 2; arrow). Cine MRI also showed asymmetric hypertrophy of the interventricular septum, which obstructed the right ventricular outflow tract during systole (Figure 3; arrows).

Isolated subvalvular pulmonary stenosis (ISPS) – subvalvular pulmonary stenosis without a ventricular septal defect – is a rare disorder that has been shown to be associated with right ventricular outflow obstruction in patients with hypertrophic cardiomyopathy (1,2). It is usually accompanied by left ventricular outflow obstruction, but isolated right ventricular obstruction occurs infrequently. In contrast to conventional MRI, which requires prospective projection settings for constructing the multiple cross-sectional images, whole-heart MRI can retrospectively depict arbitrary cross-sectional images from the previously acquired three-dimensional data. In addition, whole-heart MRI allows for evaluation of the anomalous coronary artery that often accompanies ISPS (3). Thus, whole-heart MRI has the potential to become a routine diagnostic modality in patients with suspected ISPS.

Figure 3

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