Although transthoracic echocardiography is a well-established method of diagnosing vegetations in patients with infective endocarditis, its sensitivity for detection is relatively low and is operator-dependent.\textsuperscript{1,2}

We present a case of infective endocarditis in a patient with ventricular septal defect (VSD), diagnosed by cardiac magnetic resonance imaging (MRI).

A 17-year-old man previously known to have a VSD was referred because of recurrent fever. On admission, his temperature was 37.8°C. His lungs were clear on auscultation. A 4/6 pansystolic murmur was heard at the apex. No embolic findings were observed. White blood cell count was 13,160/μl, and blood cultures were positive for \textit{Streptococcus intermedius}. Transthoracic echocardiography revealed the VSD and a small mobile structure adjacent to the VSD, which was suggestive of a vegetation (Figure 1A). Cardiac MRI was subsequently performed to assess cardiac function and the presence of vegetation using a 1.5 Tesla cardiac MR imager (CV/i, GE Medical Systems, Milwaukee, WI, USA). High-velocity blood flow across the VSD (diameter 10 mm)
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and the adjacent small structure (dimensions 20×5 mm) was demonstrated on the short-axis (Figure 1B) and 4-chamber views (Figure 1C) of cine MRI. The imaging parameters for steady-state cine MRI included repetition time of 4 ms, echo time of 1.7 ms, flip angle of 60°, field of view (FOV) of 340 mm, acquisition matrix of 256×128, phase FOV factor of 0.75 and section thickness of 10 mm. Imaging time per slice location was approximately 20 s and temporal resolution of the cine MR images was 32 ms. In addition to cine MRI, the vegetation was clearly detected by first-pass contrast-enhanced perfusion MRI (Figure 1D). Perfusion MR images were obtained by using a steady-state sequence with non-selective saturation preparation, time between saturation pulse to the centre of the acquisition window of 200 ms, repetition time of 3 ms, echo time of 1.2 ms, flip angle of 45°, FOV of 340 mm, acquisition matrix of 128×96, a phase FOV factor of 0.75 and section thickness of 8 mm. Following a bolus injection of 0.1 mmol/kg of Gd-DTPA, 4 short-axis images of the left ventricle were obtained for every other heartbeat for approximately 1 min.

We diagnosed infective endocarditis with VSD, and started penicillin G and gentamycin. After 6 weeks of antibiotic therapy, surgical treatment was performed. The vegetation was on the rim of the VSD, as expected from the cardiac MRI (Figure 2). It was resected and the VSD was closed with a tricuspid valve annular plasty. The postoperative course was uneventful.

The excellent spatial resolution and angle independency of cardiac MRI enables detecting in detail structures of the heart, such as the VSD and vegetation in this case. Although we confirmed the vegetation by transesophageal echocardiography as well, this case indicates the utility of MRI for detecting vegetation, especially in patients with contraindications of transesophageal echocardiography. This is the first case in which cardiac MRI was used to diagnose infective endocarditis in a patient with a VSD.

References