






# Muscular ventricular septal defect: which diagnostic test to trust when calculating shunt fraction?

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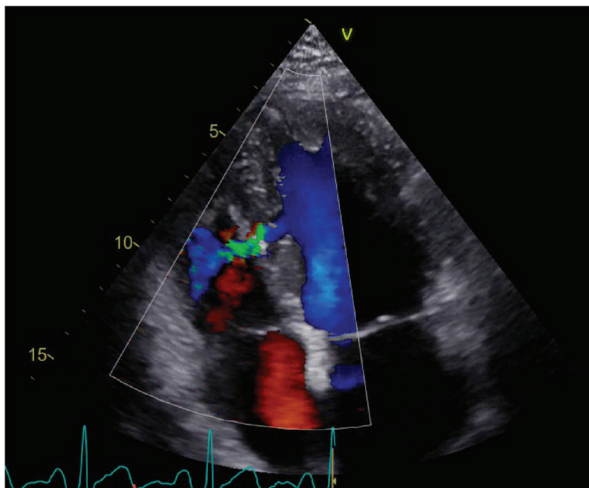
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**Introduction:** Muscular ventricular septal defect (mVSD) is a rare congenital heart defect seen in adulthood. Most mVSDs close spontaneously, but if they are larger defects, they must be surgically treated at an early age due to hemodynamic instability<sup>1</sup>. Assessment of the ratio of pulmonary (Qp) to systemic (Qs) flow, which must be greater than 1.6, is essential for timely intervention to close mVSD<sup>2</sup>.



**FIGURE 1.** Visualization of muscular ventricular septal defect from apical projection using color doppler.

**Case report:** 45-year-old man presents for a cardiological examination. He knows he has a heart murmur but has not been examined by a cardiologist. The patient has no subjective complaints, tolerates exertion very well. No other significant comorbidities except smoking. The patient had no chronic therapy. Transthoracic echocardiography verifies the mVSD at the middle third of the intraventricular septum. The canal is on the left side with a transverse diameter of about 7mm and narrows towards the right ventricle (**Figure 1**). Flow velocities through the mVSD from left to right were approximately 4.9m/s, with pressures of approximately 95mmHg. Cardiac ultrasound verified borderline enlarged atria, right (right atrium area 19cm<sup>2</sup>) and left (left atrium volume index 42ml/m<sup>2</sup>) and right and left ventricles (left ventricle enddiastolic diameter 60mm). Initial analysis of flow through the pulmonary and systemic circulation yielded a Qp:Qs ratio of 1.6. The patient then underwent a cardiac magnetic resonance, which verified a Qp:Qs of 1.1. A follow-up cardiac ultrasound was unremarkable, except for a now measured Qp:Qs ratio of 1.38. The patient then underwent radionuclide ventriculography, which verified a Qp:Qs of 1.41.

**Conclusion:** Evaluation of shunt fraction by different diagnostics test can obtain different values. An ultrasound hemodynamic assessment is essential in addition to obtaining adequate data from other diagnostic tests for an adequate assessment of timely intervention. In our patient,

borderline enlarged cardiac cavity dimensions are observed, but still without hemodynamic parameters of significant left-to-right shunting (Qp:Qs <1.6), so we decided to conduct clinical monitoring and ultrasound reevaluation once a year.

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## LITERATURE

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