We present a case where a patient, previously diagnosed with mitral stenosis and aortic insufficiency, was discovered instead to have an eccentric high-velocity transmitral inflow jet which gave a false appearance of aortic regurgitation by echocardiography. This case highlights a diagnostic dilemma where an eccentric transmitral inflow jet can masquerade as aortic regurgitation.

A 48 year old female with a history of rheumatic heart disease and St. Jude’s mechanical bileaflet mitral valve replacement (MVR) in 2004 had a preoperative transthoracic echocardiographic examination reporting severe mitral stenosis and moderately severe aortic regurgitation. She presented to the operating room for replacement of her mitral and aortic valve. An intraoperative transesophageal echocardiography examination (TEE) confirmed immobility of a mechanical mitral valve leaflet with severe stenosis. Color Doppler demonstrated severe turbulence during diastole in the left ventricular outflow tract (LVOT) giving the appearance of severe aortic regurgitation. Further analysis using spectral Doppler of intraventricular flow documented that turbulence occurred late after mitral valve opening, instead of following aortic valve closure, suggesting that it was related to mitral inflow, not aortic regurgitation. Further, absence of reversal of aortic flow in the proximal descending thoracic aorta and normal appearing aortic valve leaflets suggested a competent native aortic valve. Patient received a #27 St. Jude MVR. TEE performed following separation from cardiopulmonary bypass demonstrated a well-seated mitral valve and an aortic valve without regurgitation.

This case demonstrates how an eccentric high-velocity transmitral inflow jet causing turbulence in the LVOT can masquerade as aortic regurgitation. Differentiation of the source of LVOT turbulence was complicated by poor visualization of the jet due to shadowing and reverberation of the mechanical mitral valve leaflets. However, spectral Doppler successfully differentiated mitral stenosis from aortic regurgitation. Although mitral inflow and aortic regurgitation can demonstrate similar patterns on spectral Doppler when the sample volume is placed between the mitral and aortic valves, the signal from an aortic regurgitant jet begins immediately after aortic valve closure compared with mitral inflow beginning later after mitral valve opens. Also, aortic regurgitation is associated with diastolic jets usually greater than 2m/s, compared with mitral stenosis which is usually less than 2m/s. These two signals can be further distinguished by the shape of the flow velocity pattern, especially if secondary acceleration in late diastole caused by atrial contraction is present.

In summary, the etiology of turbulence in the LVOT can be differentiated by spectral Doppler, including timing and specific characteristics of each jet and TEE valvular assessment.

1. Circulation 1986;73:460
2. Circulation 1979;60:1096