An auscultatory conundrum: severe mitral stenosis with a third heart sound?

William R. Miranda, Darrell B. Newman, Jeffrey B. Geske, and Rick A. Nishimura*

Division of Cardiovascular Diseases, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA

*Corresponding author. Tel: +1 507 774 2129; Fax: +1 507 538 6915; E-mail: mnishimura@mayo.edu

A 70-year-old asymptomatic woman was referred for intervention of severe mitral stenosis (MS). Physical exam demonstrated a soft first and normally split second heart sound, an apical 2/6 holosystolic murmur and a soft diastolic rumble. There was also a loud early diastolic filling sound—S3 (sound clip, Supplementary data online) (Panel C). Transthoracic echocardiography revealed normal left ventricular size and function (ejection fraction 72%) and an estimated right ventricular systolic pressure of 69 mmHg. There was severe mitral annular calcification (Panel A) with associated restricted leaflet motion. The diagnosis of severe MS was made with a continuous wave Doppler transmitral mean gradient of 11 mmHg (heart rate 59 bpm). Mild—moderate mitral regurgitation (MR) was identified by a small color flow jet into the left atrium (Panel B). Given the discrepancy between auscultatory findings and the echocardiographic interpretation, transesophageal echocardiography was performed, demonstrating moderate-to-severe MR (Panel D)—regurgitant volume of 51 mL by proximal isovolumic surface area. Thus, mitral balloon valvotomy was not recommended.

Our case underscores the importance of physical examination in the evaluation of valvular heart disease—severe isolated MS and an S3 should not coexist. Acoustic shadowing in the setting of extensive mitral annular calcification may result in underestimation of MR severity by color Doppler. A large V wave from significant MR results in a high driving pressure, which may be misinterpreted as true obstruction. Under appreciation of MR should be suspected if an S3 is auscultated, which correlates with a high E wave velocity and markedly elevated E/A ratio on transmitral Doppler interrogation.

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.