



Flow convergence visualized in mitral regurgitation with spontaneous echo contrast

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We present a case of severe mitral regurgitation with a left ventricular flow convergence zone identified with spontaneous echo contrast (SEC). To our knowledge this is the first visualization of a flow convergence zone with SEC alone.

A 63-year-old woman with a history of diastolic heart failure and mitral regurgitation underwent transesophageal echocardiography (TEE) for further assessment of her mitral insufficiency. At the time imaging was obtained, her hemoglobin was 12.9 g/dL, hematocrit was 40.8%, and international normalized ratio was 1.2. Imaging revealed a ruptured anterior chord of the mitral valve with flail leaflet and severe mitral regurgitation with left atrial enlargement and retrograde flow in the pulmonary veins. The left ventricular flow convergence zone was identified with SEC alone. Findings were confirmed with color Doppler flow imaging (Fig. 1). The unusual presence of SEC in this case, which clearly corresponded to the zone of flow convergence identified by

color flow Doppler imaging, evokes the image of the center of a whirlpool. Hence we believe this finding should be called the “Charybdis Echo Contrast Sign” after the creature of Greco-Roman mythology that resembles this appearance.

Although TEE is commonly used in the assessment of mitral valve insufficiency, this may be the first reported case in the literature of a PISA radius visualized without the use of color Doppler. Evidence of regurgitant jet findings with SEC have been previously described [1], but to our knowledge this is the first visualization of a flow convergence zone with SEC alone. One would not expect to see SEC in this setting given the high velocity of flow, as SEC is known to be primarily associated with low blood flow velocities [2]. This makes the Charybdis Sign an unusual but significant finding. Further research regarding biophysics of SEC in mitral regurgitation with flail leaflet may help provide an explanation for this phenomenon.

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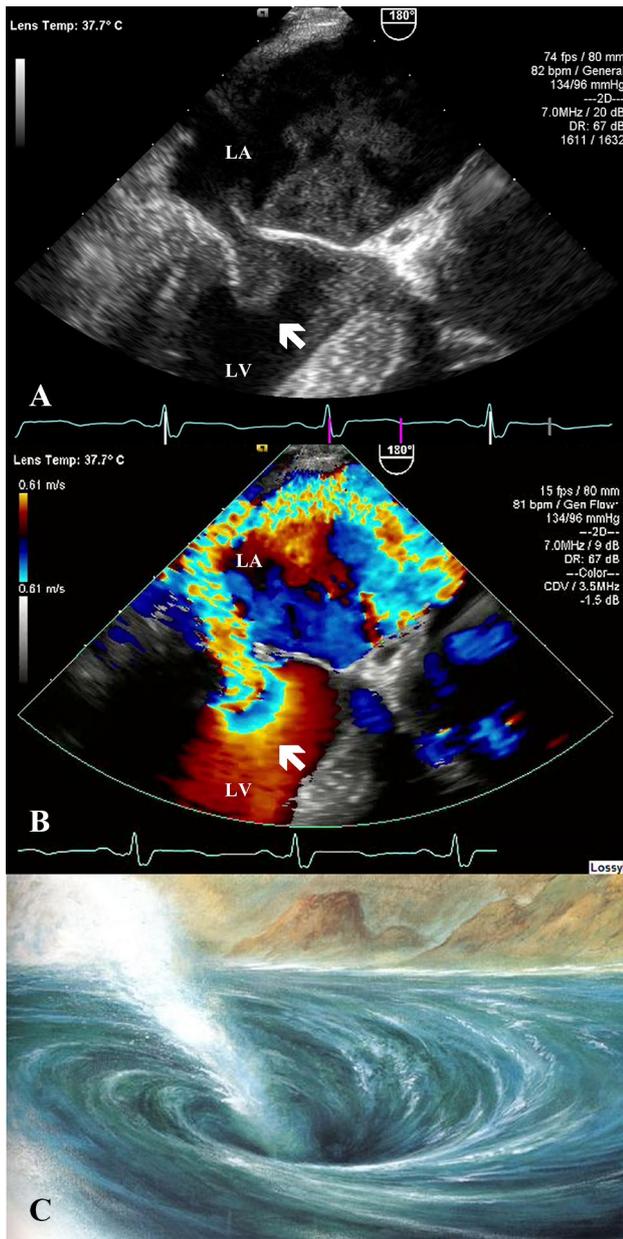


Fig. 1 Transesophageal echocardiogram, mid-esophageal two chamber view. **a** Flow convergence with SEC in the left ventricle (arrow). **b** Doppler color flow image for comparison. *LA* left atrium, *LV* left ventricle. **c** Artistic representation of the Charybdis of Greco-Roman mythology. Courtesy of Bob Eggleton, with permission

Compliance with ethical standards

Conflict of interest The authors declare that there is no conflict of interest.

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