A 56-year-old woman was admitted to our institution because of effort dyspnea. One year earlier, she had received mitral and aortic valve prostheses. On examination, ankle and lower-leg edema was present, along with pulmonary rales. ECG documented atrial fibrillation with high ventricular rate (140 bpm). A transthoracic echocardiogram revealed a left atrial diameter of 58 mm and a biventricular dilatation with impaired systolic function (ejection fraction 25%) but normally functioning prosthetic valves and no vegetations. During transesophageal recording, “bright particles” were seen originating in and then traveling away from the mitral valve (Figure).

These particles are consistent with gas bubbles that occur in scuba divers after hypobaric decompression (see Data Supplement). Valve closure contributes to an abrupt decrease of ambient pressure—a phenomenon known as cavitation—causing explosive vaporization and producing large gaseous nuclei for stable gas bubble formation. During pressure recovery, in which the cavity collapses in less than a millisecond, vapor condenses to liquid, whereas gas, which needs longer times to dissolve, may be left in the form of a gas bubble. Stable gas bubbles could persist long enough to reach the outflow tract.
Bubbles in the Heart
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