56-year-old man who was admitted with acute myocardial infarction developed severe heart failure following stent placement in the left anterior descending artery. Ventricular septal perforation (VSP) was diagnosed. Conventional septal closure was considered high risk due to severe heart and multiple organ failure. We decided to place a stent graft in the left ventricle to exclude the VSP (A and B). The stent was placed retrograde from the ascending aorta through the aortic valve into the left ventricle, and the tip was stabilized to the apex. After stent placement, right ventricular free-wall bulging decreased markedly. Cardiac catheterization showed reduction of shunting to 20%. Three years after the procedure, no increase in shunting was observed. Chest radiograph and computed tomography showed no pulmonary coronary and a stent in the heart (C and D). This is the first report, to our knowledge, of placing a stent in the left ventricle to close VSP after acute myocardial infarction. Please see accompanying Online Videos 1, 2, 3, and 4.