

# Ventricular septal rupture after mechanical mitral valve replacement

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DOI: 10.33963/KPa.2022.0012

## Received:

January 11, 2022

## Accepted:

January 16, 2022

## Early publication date:

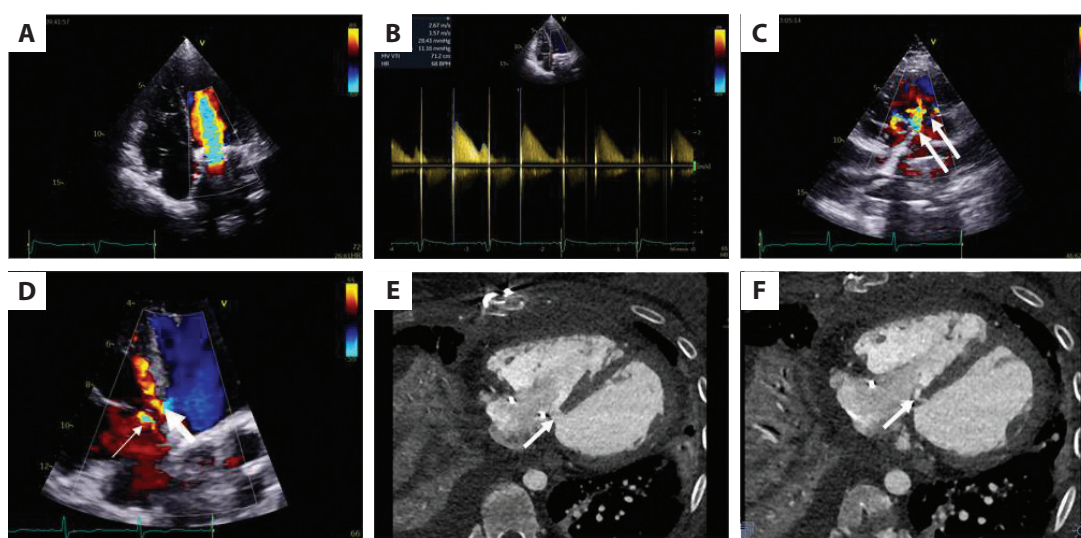
January 18, 2022

Adults with congenital heart disease often require several cardiothoracic interventions throughout their lifespan, with each re-operation posing an additional risk of short- and long-term complications.

Here, we present the case of an 18-year-old female patient with congenital partial atrioventricular canal and parachute mitral valve. She underwent surgical closure of the atrial septal defect with an autologous pericardial patch in 2002. This was followed by a 21-mm St. Jude Medical mechanical mitral valve replacement due to severe mitral incompetence in 2004. She was admitted to our institution with heart failure symptoms, New York Heart Association (NYHA) class III. Echocardiographic examination revealed pannus-related mechanical prosthesis dysfunction causing severe mitral stenosis (Figure 1A, B). She was referred for the mitral valve replacement. The early postoperative period after a 25-mm St. Jude Medical Regent valve replacement was uneventful. During the third post-operative day, the patient presented with progressive dyspnea and hypotension requiring catecholamine infusion. A right pleural effusion was diagnosed and drained. Despite her stable condition, recurrent pleural effusions developed. The physical examination revealed a loud holosystolic murmur at the left sternal border with a thrill. Transthoracic echocardiography showed a rupture in the muscular part of the interventricular septum with two left-to-right shunts considered significant (Figure 1C, D). Cardiac computed tomography confirmed the diagnosis (Figure 1E, F). The patient was referred for a redo operation. Ventricular septal rupture closure using

a pericardial patch followed by a tricuspid valvuloplasty with a 26-mm Edwards ring were performed. In the early postoperative period, the patient required another pleural drainage. Laboratory investigations showed hypoalbuminemia, which was treated with intravenous albumin supplementation. Moreover, *Pseudomonas aeruginosa* wound infection was diagnosed. As targeted antibiotic therapy was ineffective, negative pressure wound therapy was implemented. All the applied treatment methods resulted in gradual improvement in the patient's condition. Eventually, she was discharged from the hospital, and after a 3-month follow-up period, remained free of heart failure symptoms.

Rupture of the left ventricle is a very rare and serious complication of mitral valve replacement [1]. It was described mainly in the area of the left ventricular posterior wall and classified into three types according to its localization: (1) at the atrioventricular groove; (2) at the base of the papillary muscles; or (3) between the base of the papillary muscles and atrioventricular groove [2]. After the first report by Zacharias et al. in 1975 [3], currently almost no new cases can be found in the literature. There are, however, reports of atrioventricular septal rupture causing left ventricle-right atrium shunt (Gerbode type) related to mitral valve replacement [4]. We support Beranek's hypothesis that similarly to rupture of other parts of the left ventricular wall, the rupture of the muscular part of the interventricular septum, as seen in our patient, could be potentially caused by excessive myocardial stretching. In turn, this could lead to cardiomyocyte apoptosis, secondary



**Figure 1.** **A.** Transthoracic echocardiography. Apical four-chamber view. Color flow Doppler. Turbulent flow through mitral mechanical mitral prosthesis. **B.** Transthoracic echocardiography. Continuous flow Doppler signal. Elevated gradients through mechanical mitral prosthesis reaching 28.4 mm Hg of maximum and 11.2 mm Hg of the mean pressure gradient. **C.** Transthoracic echocardiography. Parasternal short-axis view. Two ruptures in the muscular part of the ventricular septum with left-to-right shunts (the arrows). **D.** Transthoracic echocardiography. Apical four-chamber view. Left-to-right shunt through one of the ventricular ruptures (wide arrow), tricuspid regurgitation (the narrow arrow). **E.** Cardiac computed tomography. Axial view. One of the ventricular septum ruptures (the arrow). **F.** Cardiac computed tomography. Axial view. The second of the ventricular septum ruptures (the arrow)

hemorrhage, and weakening of the ventricular wall [5]. Yet, the question of why precisely this part of the left ventricle ruptured remains unanswered.

### Article information

**Conflict of interest:** None declared.

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