An 88-year-old man with a 16-year history of eosinophilic myocarditis and atrial fibrillation treated with prednisolone 5 mg and warfarin, was admitted with heart failure refractory to optimal medical therapy. Eosinophilia and elevation of eosinophilic cationic protein, a marker of eosinophilic myocarditis activity, were not observed. He had ventricular enlargement, low ejection fraction of 37% and left atrial (LA) enlargement (volume index, 165 mL/m^2) with grade 4+ functional mitral regurgitation (MR) from the center of the valve along with pulmonary hypertension. Given the high surgical risk (STS, 8.1%), the heart team decided to enroll him as the first

Figure. (A) Severe mitral regurgitation improved after (B) percutaneous edge-to-edge mitral valve repair, with (C) no spontaneous echo image or thrombus in the left atrial appendage (LAA). (D) Mitral valve area did not reach the stenotic valve criteria, confirmed on both 2-D and 3-D echo. (E) One week after the procedure, large thrombus (17×17 mm) was observed at the LAA (Movie S1). (F) The size of the thrombus decreased after maintenance of high international normalized ratio for 3 weeks, and dissolved 5 weeks after the procedure (Movie S2).
patient in the AVJ-514 trial (a clinical trial to confirm the reproducibility of the evidence of percutaneous edge-to-edge mitral valve repair in Japan).1 MR was reduced from 4+ to 1+ after 2 clips, and no thrombus was detected in the LA or LAA appendage (LAA) immediately after the procedure (Figure A–C). Mitral valve area was 2.9 cm² and the mean transmural gradient was 4 mmHg, indicating absence of mitral stenosis (Figure D). Anticoagulation therapy was done by heparin with activated clotting time maintained at 250–300 s during the procedure, and continued with activated partial thromboplastin time maintained at double the normal range after the procedure. Warfarin was started from the next day after the procedure and heparin was discontinued 4 days after, when warfarin control was in the therapeutic range (international normalized ratio [INR], 1.5–2.0). New York Heart Association (NYHA) functional class improved from III to II along with a decrease in brain natriuretic peptide (BNP) from 509 to 235 pg/mL. Follow-up transesophageal echocardiography (TEE) 1 week after the procedure, however, indicated thrombus (size, 17 × 17 mm) in the LAA (Figure E). Given the high estimated stroke rate according to the CHADS2 and CHA2DS2-VASc scores of 4 and 5, respectively, and the intermediate bleeding risk according to the HAS-BLED score of 2, INR was controlled at a higher level (2.5–3). At 3 weeks, a gradual decrease in thrombus size (12 × 12 mm) was noted, and thrombus was not detected at 5 weeks (Figure F). INR was controlled at 2.0–2.5 thereafter. At 1-year follow-up, NYHA functional class remained at II with no occurrence of heart failure or systemic embolization. BNP remained at 276 pg/mL and 6-min walk distance improved from 215 m before the procedure to 330 m. TEE showed no thrombus in the LA or LAA.

Despite the low stroke rate (<1%) after percutaneous edge-to-edge mitral valve repair, acute thrombus formation following the repair has been reported.4 Development of procedure-related mild mitral stenosis and sudden elimination of the washout effect by MR5 are thought to be the underlying mechanisms. Eosinophilic myocarditis is known to produce left ventricular thrombus at an acute inflammatory phase, providing another possible cause of thrombus formation. In the present case, no mitral stenosis was detected. Also, given that the present case was in the clinical trial, LAA thrombus might have been identified coincidentally on post-procedural TEE 1 week later. Therefore, given the post-procedural thrombus risk, it is important to pay attention to anticoagulation therapy within 1 week of percutaneous edge-to-edge mitral valve repair. In the case of abnormality requiring clarification, including mitral valve morphology or anti-thrombotic status, additional TEE should be performed. In the present case we successfully treated the thrombus by increasing the oral anticoagulation dose. As reported previously,6 however, combining edge-to-edge mitral valve repair with occlusion of the LAA may be of value in particular patients with high thromboembolic risk and contraindications for oral anticoagulation.

Disclosures

This patient was enrolled in AVJ-514 trial, funded by Abbot vascular.

References


Supplementary Files

Supplementary File 1

Movie S1. Transesophageal echo image of left atrial appendage a week after the procedure.

Supplementary File 2

Movie S2. Transesophageal echo image of left atrial appendage 5 weeks after the procedure.

Please find supplementary file(s): http://dx.doi.org/10.1253/circj.CJ-17-0781