

Acute Left Atrial Spontaneous Echocardiographic Contrast and Suspicious Thrombus Formation Following Mitral Regurgitation Reduction With the MitraClip System



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An 87-year-old woman with chronic atrial fibrillation presented with congestive heart failure (New York Heart Association functional class III) despite guideline-directed medical therapy. Transesophageal echocardiography (TEE) showed severe eccentric mitral regurgitation (MR) (i.e., vena contracta = 8 mm) with preserved left ventricular ejection fraction and prolapse of the posterior leaflet that was due to chordae rupture (Figure 1A, Online Video 1). The heart team's decision was to perform MitraClip implantation because of the prohibitive surgical risk (STS risk calculator predicted risk of mortality of 11.6%). Intraprocedural TEE showed neither spontaneous echocardiographic contrast (SEC) nor thrombus in the left atrium (LA)/left atrial appendage (LAA) before the procedure (Figure 1B). After successful implantation of the first clip, moderate MR was still present, hence implantation of a second clip was considered. However, after complete reduction of MR following grasping with the second clip, acute SEC appeared in the LA (Figure 1, Online Video 2), whereas fresh thrombus formation in the LA/LAA was suspected (Figure 1C, Online Video 3). Transmitral valve gradient was 2.4 mm Hg (Figure 1D). Drastic regurgitant flow reduction in the LA/LAA was

considered to be one of the causes of this unexpected event; therefore, the second clip was withdrawn. Interestingly, SEC as well as the suspicious LA/LAA thrombus immediately disappeared without further intervention after removing the second clip (Figure 1E and 1F, Online Video 4). The patient was discharged 4 days after the procedure without neurological or cardiovascular complications.

Previous investigation demonstrated the protective effect of severe MR against LA SEC and thrombus formation (1). We hypothesize that dramatic acute hemodynamic changes from chronic severe MR to mild mitral stenosis could be a reasonable explanation for our findings, considering the course of the events coupled with an activated clotting time within the therapeutic range (i.e., 286 s) during the intervention; nonetheless, we acknowledge that a prothrombotic milieu induced by the intravascular devices utilized in the procedure cannot be completely ruled out in the present case (2). Importantly, after observing by online TEE the presence of SEC and possible thrombus after grasping the valve leaflets with the second clip, we were able to easily retrieve it because the MitraClip system allows device removal after implantation before its final release. Previous studies have reported

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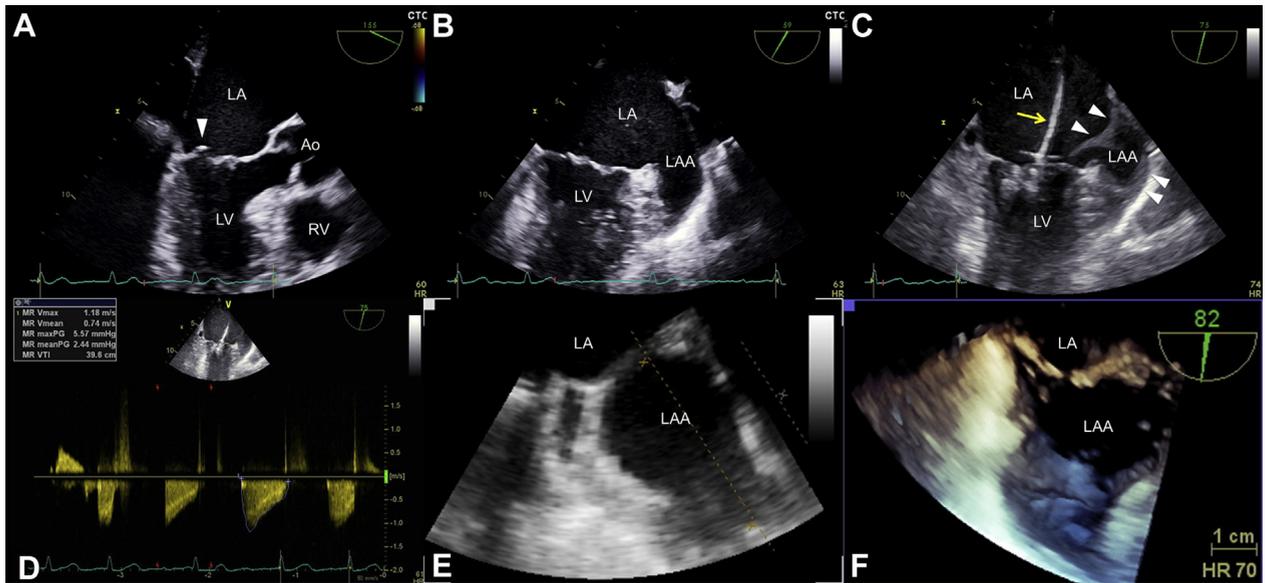


FIGURE 1 Transesophageal Echocardiographic Images of the Procedure

In **A**, the long-axis view reveals prolapse of the posterior leaflet (white arrowhead) (Online Video 1), whereas **B** demonstrates a 2-chamber view with neither spontaneous echocardiographic contrast (SEC) nor thrombus whereas in **C**, fresh thrombus (white arrowhead) is suspected in the LA and LAA (Online Videos 2 and 3). The yellow arrow denotes the clip delivery system. (**D**) Transmitral continuous-wave Doppler mean pressure gradient of 2.4 mm Hg after implantation of the second MitraClip is depicted. After the removal of the second MitraClip, thrombus was no longer visualized in 2-dimensional (**E**) and 3-dimensional (**F**) views of the LAA although residual moderate MR is observed (Online Video 4). Ao = aorta; LA = left atrium; LAA = left atrial appendage; LV = left ventricle; RV = right ventricle.

low stroke rates both periprocedural and during follow-up (~2.4%) after MitraClip implantation (3); however, the present findings might raise an alarm over this relatively low clinical event, which therefore deserves additional investigation.

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APPENDIX For the supplemental videos, please see the online version of this article.