

Left atrial spontaneous echo contrast and thrombus formation at septal puncture during percutaneous mitral valve repair with the MitraClip system of severe mitral regurgitation: a report of two cases 🎬

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Introduction

Percutaneous mitral valve repair with the MitraClip is a new promising therapeutic option for symptomatic severe mitral regurgitation (MR) for patients being at high risk for conventional surgery. In spite of its beneficial effect, theoretically, Mitraclip may have an acute, harmful effect on left atrial spontaneous echo contrast (LASEC) and thrombus formation especially in severe MR patients with atrial fibrillation (AF). However, to the best of our knowledge, LASEC and thrombus formation during percutaneous mitral valve repair with the MitraClip of severe MR has not been well documented in the literature.

Here we present, two unique cases, a thrombus formation at the septal puncture site, and LASEC formation during percutaneous mitral valve repair with the MitraClip system of severe MR.

Case Reports

Case 1

The first case was a 75-year-old man with AF, severe MR and a left ventricular (LV) ejection fraction (EF) of 25%. Transesophageal echocardiography (TEE) demonstrated severe MR at A2-P2. The patient and his family were offered percutaneous repair of severe MR and informed consent was obtained.

MR was reduced from 4+ to 1+ and mean transmitral gradient was 2 mm Hg in the end of the MitraClip procedure. However, when the leaflets were grasped, marked LASEC was observed during TEE (Fig. 1, Video 1. See corresponding video/movie images at www.anakarder.com). LASEC was clearly absent immediately before grasping the leaflets in this case (Fig. 2, Video 2. See corresponding video/movie images at www.anakarder.com). During the procedure, ACT between 250 and 300 s were confirmed at 15 min after initial bolus and at 30 min intervals. The patient's ACT was 280 seconds at the time of device deployment. He received warfarin after the procedure. At one month follow up, he was clinically stable and transthoracic echocardiography revealed a mild degree of MR.

Case 2

The second patient was a 43-year-old man with a LV EF of 15%. His medical history included paroxysmal AF. TEE demonstrated severe MR at A2-P2. He was selected to have percutaneous mitral valve repair with the MitraClip system due to his unsuitability for heart transplantation. The patient and his family were offered percutaneous repair of



Figure 1. Transesophageal echocardiography demonstrates trace residual MR and marked LASEC (marked with arrow) after grasping the leaflets in case 1

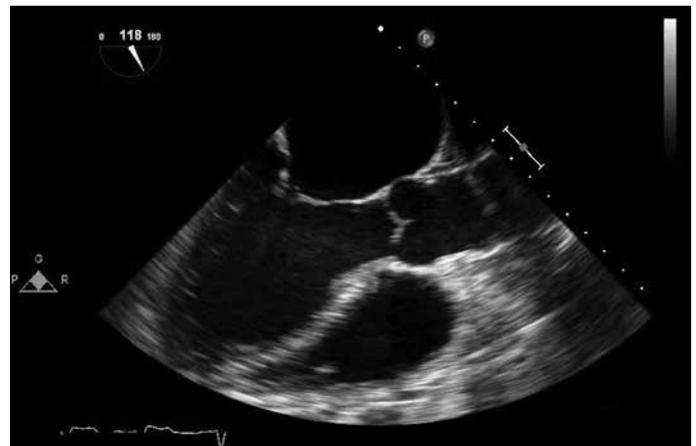


Figure 2. LASEC was absent before grasping the leaflets in case 1

severe MR and informed consent was obtained. During the Mitraclip procedure, the patient developed AF but recovered in the end of the procedure. MR was reduced from 4+ to 1+ and mean transmitral gradient was 2 mm Hg. His ACT was 260 seconds at the time of device deployment.

Immediately after the guide catheter removal from the interatrial septum, TEE demonstrated a mobile echogenic and fluctuating mass seemed to be attached to the interatrial septum at the septal puncture site and mild LASEC (Fig. 3, 4). In the short axis view, the mass was visualized moving back and forth between the left and right atrium (Video 3. See corresponding video/movie images at www.anakarder.com).

The patient was managed with anticoagulation because of the high-risk nature of surgery. Postoperatively, while under the treatment with heparin, warfarin was added. The TEE performed on the 5th post-operative day demonstrated no interatrial septal thrombus. At one month follow up, the patient remained clinically asymptomatic and transthoracic echocardiography revealed a mild degree of MR.

Discussion

In patients with severe MR, the MR jet may agitate blood stasis in left atrial (LA) cavity, reducing LASEC and thrombus formation, when compared with mild to moderate MR (1). The mechanism underlying the increase in LASEC after the reduction of MR by Mitraclip procedure in



Figure 3. Basal short axis view before procedure in case 2



Figure 4. Basal short axis view showing echogenic mass attached to the interatrial septum at the septal puncture site in case 2

our patients could be the disappearance of marked MR jet agitated blood stasis in LA cavity and the reduced mitral valve area due to clip. Another possibility is that the acute increase in LV afterload induced by removing the low-impedance regurgitant flow may have contributed to LASEC formation.

The occurrence of a heart thrombus associated Mitraclip procedure is rare and, to our knowledge, has been previously reported only in the LA and LV with routine pre-discharge echocardiography few days after implantation (2-5). In our second case, thrombus formation was observed during the Mitraclip procedure. However, there is no data in the literature on LASEC formation after or during the Mitraclip procedure.

In our second case, the mechanism of interatrial thrombus formation after mitraclip implantation might be the disappearance of severe MR jet agitated blood stasis in LA cavity. However, the reduced mitral valve area due to clip, endocardial damage during septal puncture, an inflammatory response to foreign body (guide catheter) contact with the atrial septum and the duration of the Mitraclip procedure may have contributed to a prothrombotic or hypercoagulable state, which could be responsible for thrombus formation. The thrombus could also originate from the inside of the guide catheter while moving the guide catheter out. In addition, immediately after the Mitraclip procedure, a thrombus was observed despite having an ACT of 260 s. This case may also illustrate the need to be cautious despite achieving ACTs of >250 s during the Mitraclip procedure especially in the presence of AF.

Conclusion

This report shows that thrombus and SEC formation in the LA may occur during percutaneous mitral valve repair with the MitraClip system of severe MR.

Video 1. Transesophageal echocardiography demonstrates a trace residual MR and marked LASEC in left atrium and left atrial appendage in case 1

Video 2. LASEC was clearly absent immediately before grasping the leaflets in case 1

Video 3. Transesophageal echocardiography demonstrates a mobile echogenic and fluctuating mass seemed to be attached to the interatrial septum at the septal puncture site and mild LASEC immediately after the guide catheter removal from the interatrial septum in case 2

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Available Online Date: 25.06.2014

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DOI:10.5152/akd.2014.5355



Cryoablation of an anteroseptal accessory pathway through the jugular and subclavian veins in a patient with interruption of the inferior vena cava and azygos continuation

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