

IMAGES IN INTERVENTION

The Feasibility of Transcatheter Edge-to-Edge Repair in the Management of Acute Severe Ischemic Mitral Regurgitation



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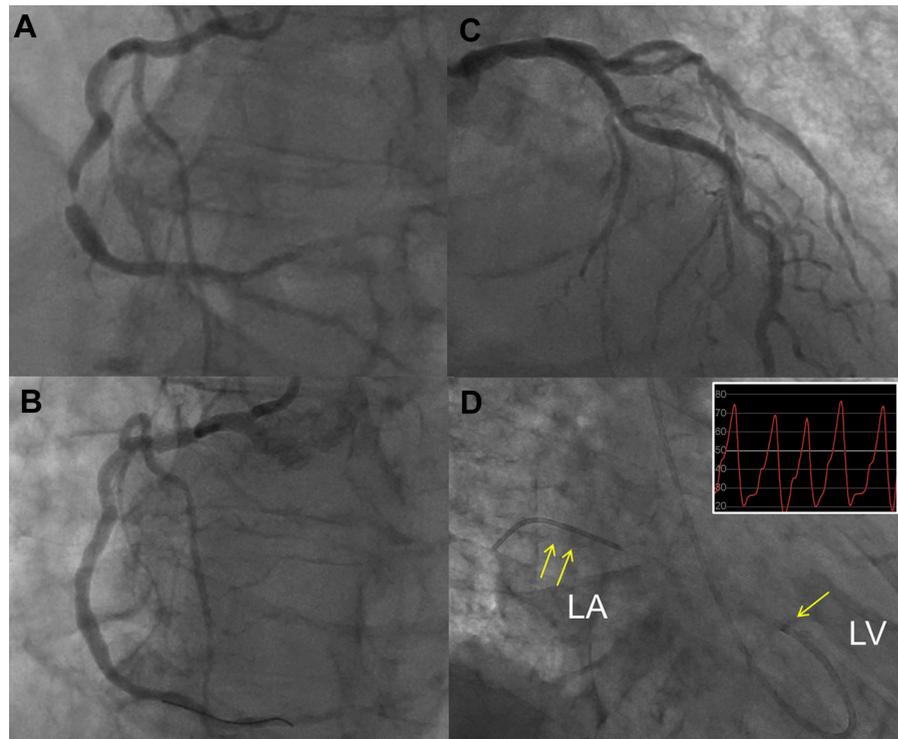
Trascatheter edge-to-edge mitral valve repair with MitraClip (Abbott Vascular, Santa Clara, California) is an effective therapy for patients with severe degenerative mitral regurgitation (MR) who are at high-risk for surgery (1). Experience with using the MitraClip in patients with acute MR complicating myocardial infarction is limited (2).

A 77-year-old man with hypertension and emphysema presented with chest pain, dyspnea, and cough. On presentation, he was normotensive (118/77 mm Hg), tachypnic, and hypoxemic (oxygen saturation, 92%). A 4/6 holosystolic apical murmur and bibasilar crackles were heard on auscultation. Chest radiograph showed pulmonary edema. Electrocardiogram revealed sinus rhythm, right bundle branch block, and lateral ST depression. Troponin-I was 5,190 ng/l. Heparin was started and cardiac catheterization was planned. Over the next 24 h, the patient developed hypotension and worsening hypoxemia. Coronary angiography and left ventriculography revealed 99% right coronary artery stenosis, mild left anterior descending artery stenosis, severe inferior wall hypokinesis, and severe MR (Figures 1A and 1B, Online Video 1). The right coronary artery was stented with a 3.0 × 18 mm drug-eluting stent (Figure 1C). Aortic pressure was 77/49 mm Hg, right atrial pressure was 24 mm Hg, mean pulmonary artery pressure

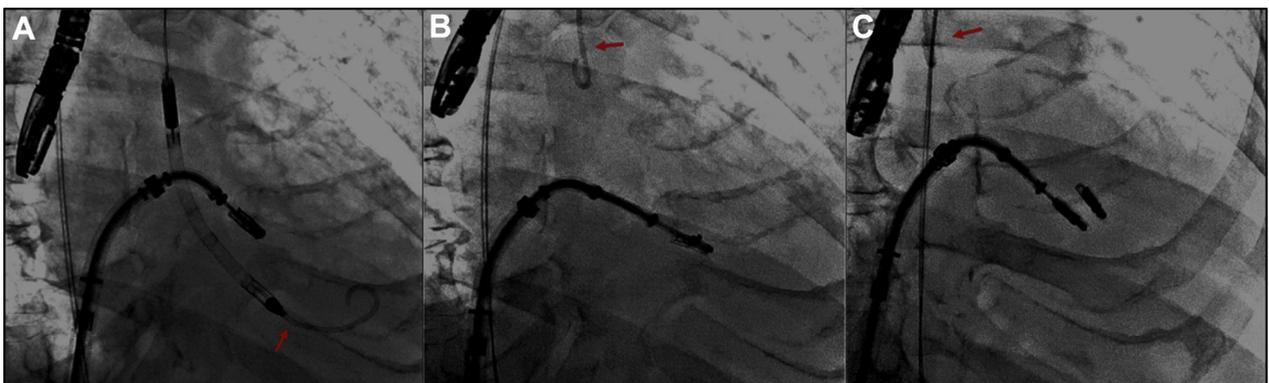
was 34 mm Hg, and cardiac index was 1.6 l/min/m². Mean left atrial pressure measured via a retrograde approach was 38 mm Hg (V-wave, 74 mm Hg) (Figure 1D). An Impella-CP (Abiomed, Danvers, Massachusetts) device was inserted and provided 3.3 l/min flow support. Over the next 48 h, the patient remained dependent on circulatory support. Following a heart team discussion, it was decided to proceed with MitraClip implantation. After the MitraClip guide was advanced into the left atrium, the Impella-CP device was pulled into the aorta and left at performance level 1 (Figures 2A and 2B). Two Mitraclips were implanted reducing MR to trivial and left atrial pressure from 38 mm Hg to 20 mm Hg (Figure 2C). Real-time three-dimensional transesophageal echocardiography showed adequate grasping of the flail A2 segment and near resolution of MR (Figure 3, Online Videos 2 and 3). The patient was discharged home on post-operative Day 6, and remained asymptomatic at 45 days follow-up. This case illustrates the feasibility and the effectiveness of MitraClip in the management of acute ischemic MR.

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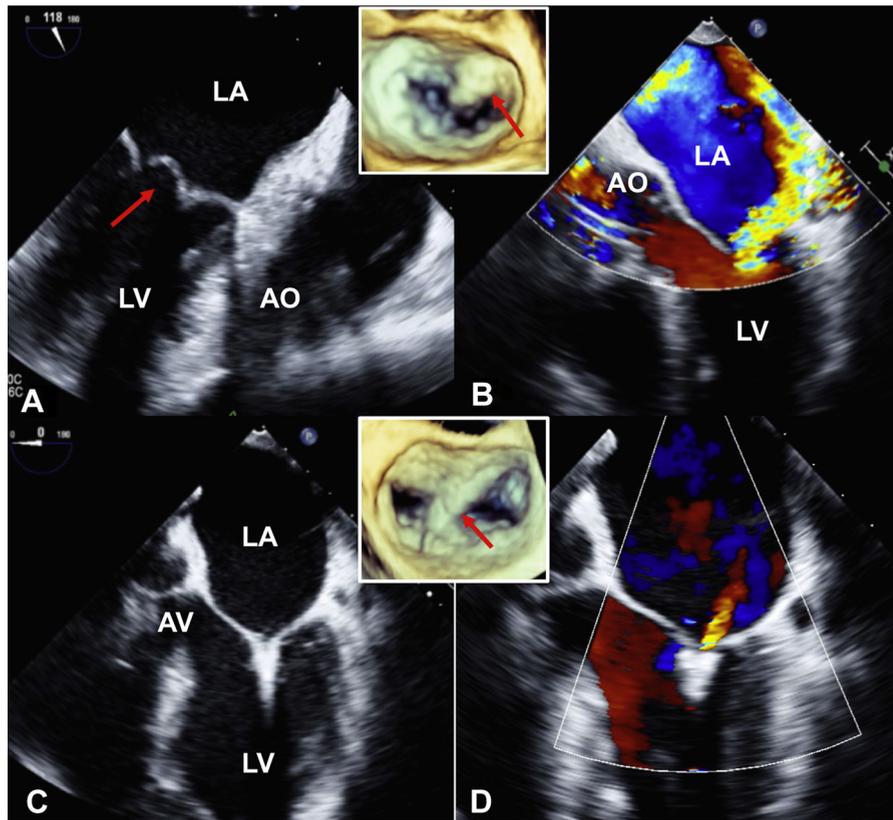
FIGURE 1 Fluoroscopy Still-Frames of the Coronary Angiogram and the Left Atrial Pressure Measurement

Culprit right coronary artery stenosis before (A) and after (B) stenting (Online Video 1). (C) Mild left anterior descending artery stenosis. (D) Retrograde measurement of left atrial pressure with a telescoping 6F JL-3.5 guiding catheter (single arrow) and a 125-cm 4F vertebral catheter (double arrow). LA = left atrium; LV = left ventricle.

FIGURE 2 Fluoroscopy Still-Frames of the Mitraclip Procedure

(A) Impella-CP in the left ventricle during clip advancement. (B) Impella-CP retracted into the ascending aorta and placed at support level 1. (C) Second MitraClip being deployed medial to the first clip. The arrows point to the Impella-CP Device (Online Videos 2 and 3).

FIGURE 3 Assessment of Mitral Regurgitation by Transesophageal Echocardiogram Before and After MitraClip Implantation



(A) Left ventricular outflow tract view showing a prolapsed A2 segment (arrow). **(B)** Color flow imaging showing severe eccentric mitral regurgitation. 3-dimensional image of the prolapsed A2 segment (top middle insert). **(C)** Modified 5-chamber view showing stable clip position. **(D)** Color flow imaging showing trivial residual regurgitation. 3-dimensional image showing a double orifice of the mitral valve (lower middle insert). AO = aorta; AV = aortic valve; RV = right ventricle; other abbreviations as in Figure 1.

REFERENCES

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2. Bahlmann E, Freker C, Kreidel F, et al. MitraClip implantation after acute ischemic papillary muscle

rupture in a patient with prolonged cardiogenic shock. *Ann Thorac Surg* 2015;99:e41-2.

KEY WORDS acute myocardial infarction, mechanical circulatory support, mitral

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