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IMAGES IN INTERVENTION

Sustained Reduction of Tricuspid Regurgitation After Percutaneous Repair With the MitraClip System in a Patient With a Dual Chamber Pacemaker

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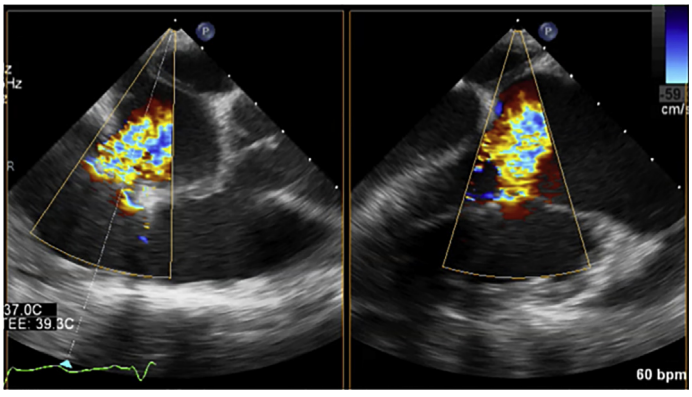
A 73-year-old woman presented with heart failure, systemic congestion, and fatigue despite optimal medical therapy. Her medical history included stage IV kidney disease and previous hepatitis B virus infection.

FIGURE 1 Baseline Transesophageal Echocardiography



The image shows severe tricuspid regurgitation secondary to annular dilation and pacemaker lead interference with the septal leaflet (Online Video 1).

In 2014, she experienced a non-ST-segment elevation myocardial infarction: coronary angiography was performed and showed 2-vessel disease with stenosis of the left anterior descending artery that was treated with drug-eluting stent implantation; chronic total occlusion of right coronary artery was also found and left to medical therapy. She underwent dual chamber permanent pacemaker (PM) implantation for third-degree atrioventricular block a year later. After this last procedure, progressive tricuspid regurgitation (TR) developed. This finding was confirmed at echocardiography performed at admission (**Figure 1**, Online Video 1): TR was secondary to annular dilation and PM lead interference with the septal leaflet. Both right and left ventricular function, as well as pulmonary pressure, were normal.

Pacing leads in the right ventricle (RV) are present in 40% to 50% of patients with severe TR, and an increased mortality rate has been observed in this population, compared with those with TR, but no PM (1). In the present case, the pacing lead may have actively contributed to the mechanism of TR by displacing the septal leaflet and by causing asynchrony in RV contraction (2). Furthermore, the

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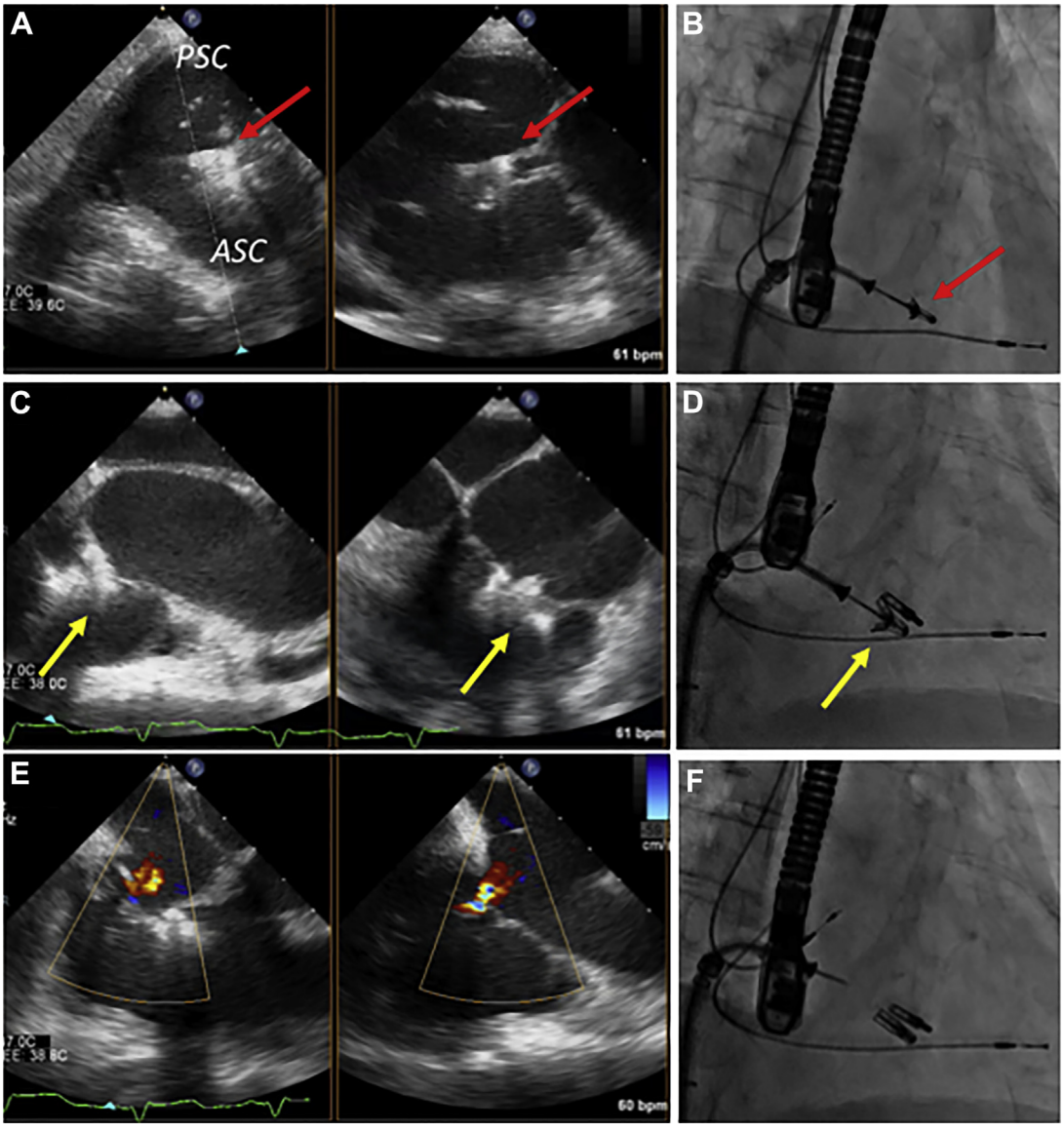
FIGURE 2 Procedural Imaging

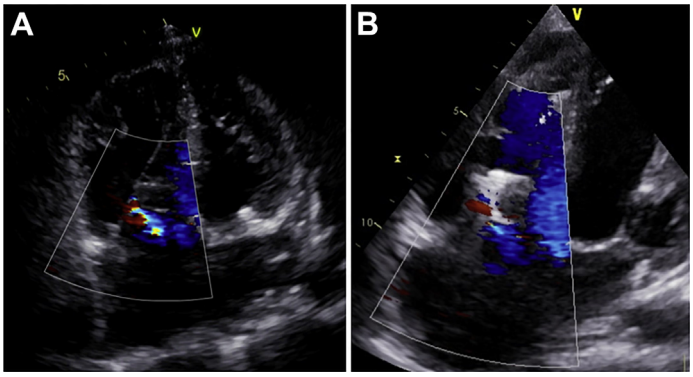


A and B show the first clip **(red arrow)** implanted near the anteroseptal commissure (ASC); **yellow arrow in C and D** indicates the second clip, implanted toward the posteroseptal commissure (PSC); **E and F** show good final result (Online Video 2).

presence of this foreign body across the valve may interfere with potential surgical or percutaneous treatment for TR (3).

After heart team discussion, the patient was deemed inoperable and was then evaluated for percutaneous transcatheter tricuspid repair with MitraClip system (Abbott Vascular, Santa Clara, California). The procedure was performed under general anesthesia with fluoroscopic and transesophageal echocardiographic guidance via percutaneous right transfemoral venous access. The guiding catheter was placed into the right atrium, and a clip was then advanced through the transcatheter valve and oriented in order to reach the anteroseptal commissure (**Figures 2A and 2B**). A second clip was advanced near the first one, toward the posteroseptal commissure (**Figures 2C and 2D**), thus effectively excluding the lead into the commissure and

FIGURE 3 Discharge and Follow-Up Echocardiogram



Echocardiogram shows consistent reduction of tricuspid regurgitation **(A)**, confirmed also after 6 months **(B)**, as well as positive right ventricular remodeling Online Video 3.

substantially reducing TR (**Figure 2E and 2F**, Online Video 2). The patient was discharged on postoperative day 2, with mild residual TR (**Figure 3A**, Online Video 3). At 6-month follow-up, she reported clinical improvement with reduction in lower limb edema and fatigue; echocardiography confirmed the consistent reduction of TR (**Figure 3B**).

In this specific setting, percutaneous transcatheter valve repair with the MitraClip system seems to be a promising option with minimal procedural risk as well as good and sustained clinical and echocardiographic results.

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KEY WORDS MitraClip, transcatheter tricuspid valve intervention, tricuspid regurgitation

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