

IMAGES IN INTERVENTION

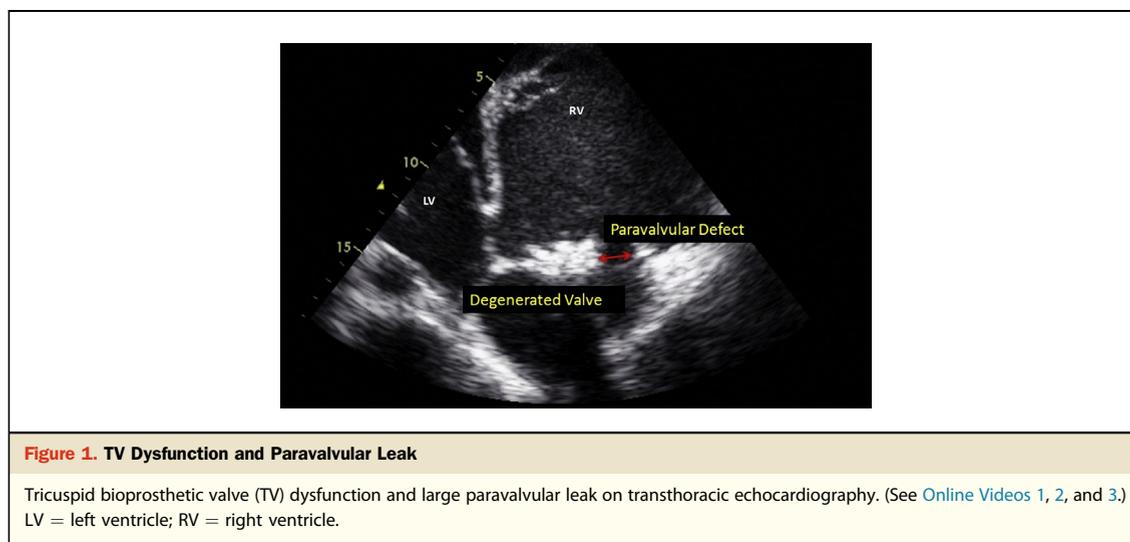
Percutaneous Valve-in-Valve Transcatheter Tricuspid Valve Replacement With Simultaneous Paravalvular Leak Closure in a Patient With Refractory Right Heart Failure

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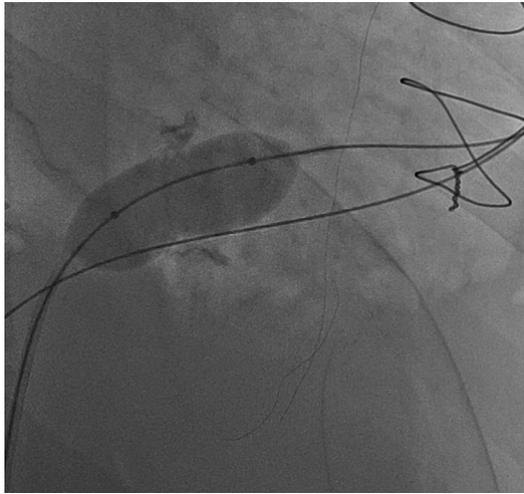
A 38-year-old male patient presented to our hospital with a 3-month history of shortness of breath in combination with severe peripheral edema and ascites. Twenty-two years previously, he had undergone bioprosthetic tricuspid valve implantation due to Ebstein anomaly. Transthoracic echocardiography revealed significantly dilated right cardiac chambers, reduced right ventricular function, stenotic and degenerated bioprosthetic tricuspid valve, and marked tricuspid insufficiency associated with a 22-mm paravalvular defect located lateral to the valve (Fig. 1, [Online Videos 1, 2, and 3](#)). Cardiac computed tomography also revealed significantly dilated right cardiac chambers and a 24-mm defect located lateral to the valve.

The patient was subjected to intense medical therapy. However, no remarkable improvement was observed. During the hospital stay, a total of 30 l of ascitic fluid was collected by paracentesis. Thus, we decided to treat both dysfunctional bioprosthetic valve and severe paravalvular leak with percutaneous treatment. The patient was admitted to the catheterization laboratory. First, the bioprosthetic tricuspid valve was predilated with a 23-mm balloon (Fig. 2). Thereafter, the bioprosthetic tricuspid valve was subjected to transvalvular valve-in-valve replacement with a 23-mm Edwards Sapien heart valve (Edwards Lifesciences, Irvine, California) (Fig. 3), followed by the closure of paravalvular leak with 30-mm Amplatzer

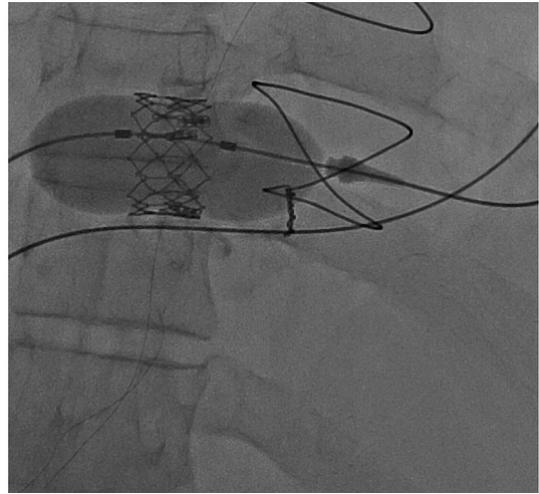


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**Figure 2. Pre-Dilation of TV**

Pre-dilation of bioprosthetic tricuspid valve (TV) with a 23-mm balloon.

**Figure 3. TV Replacement**

Transcatheter valve-in-valve replacement with a 23-mm Edwards Sapien valve. TV = tricuspid valve.

occluder device (St. Jude Medical, St. Paul, Minnesota) via transfemoral vein (Fig. 4, Online Videos 4, 5, and 6). After the procedure, the severe paravalvular leak was resolved, and transcatheter tricuspid valve was found to be functional on transthoracic echocardiography and cardiac computed tomography. The patient remained ascites-free during the first month. In conclusion, for the first time in the literature, we successfully applied transcatheter valve-in-valve bioprosthetic tricuspid valve replacement and paravalvular leak closure using Amplatzer occluder device in the same session.

The patient underwent tricuspid valve replacement for Ebstein anomaly approximately 22 years ago. Bioprosthetic valve degeneration and paravalvular leak had occurred after many years. Degeneration of tricuspid valve bioprosthesis is often encountered in young patients. Although the exact mechanism for paravalvular leak is not clear, it might be related

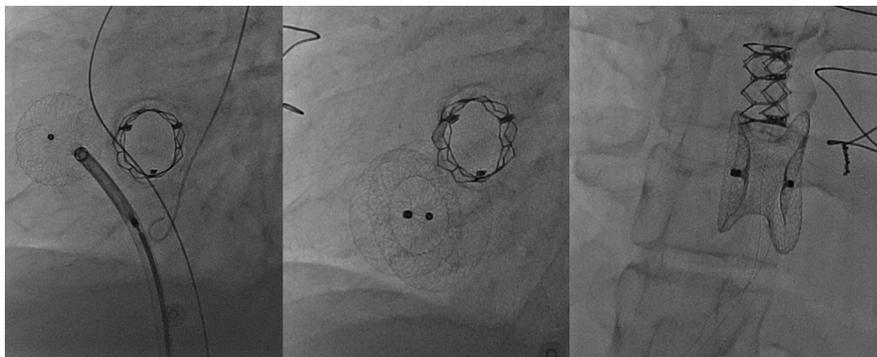
to infective endocarditis. We thought that the patient presented in the late course as the tricuspid regurgitation related to this pathology might be asymptomatic for many years.

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Key Words: paravalvular leak closure ■ right heart failure ■ transcatheter valve replacement ■ tricuspid valve.

▶ APPENDIX

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

**Figure 4. Leak Closure**

Paravalvular leak closure with 30-mm Amplatzer occluder device. (See Online Videos 4, 5, and 6.)