

IMAGES IN INTERVENTION

First-in-Man Percutaneous Transseptal Closure of Paravalvular Regurgitation After Percutaneous Valve-in-Ring Implantation



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A 73-year-old man with permanent atrial fibrillation, coronary artery disease revascularized with coronary artery bypass grafting, mitral valve repair with a 30-mm Carpentier Physio ring (Edwards Lifesciences, Irvine, California), tricuspid valve repair with a 34-mm Edwards MC3 ring (Edwards Lifesciences), and implantation of a 23-mm CarboMedics aortic valve (Sorin Group, Milan, Italy) in 2008 was admitted because of recurrent congestive heart failure secondary to severe mitral regurgitation that was due to mitral ring dysfunction. Associated comorbidities included thrombocytopenia and chronic renal failure. The patient was not considered a surgical or MitraClip (Abbott Laboratories, Chicago, Illinois) candidate by the heart team. Transcatheter mitral valve-in-ring (ViR) was considered the most suitable treatment.

Using a transseptal approach over a venoarterial loop, a 29-mm Edwards SAPIEN XT valve (Edwards Lifesciences) was correctly implanted within the mitral ring (Figure 1A); however, echocardiography demonstrated significant paravalvular regurgitation between the ring and the valve (Figure 1B). Balloon post-dilation was not considered an option because of the risk of para-ring dehiscence or distortion of the ring.

Percutaneous closure of the leak was scheduled. A 5 × 7-mm leak was measured by 3-dimensional transesophageal echocardiogram. After transseptal

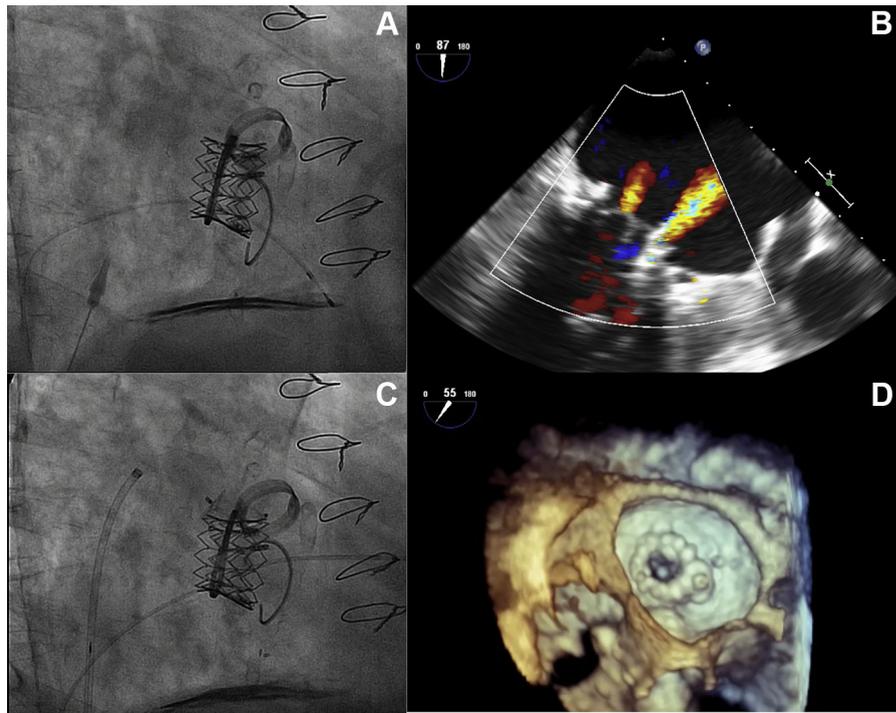
puncture, the leak was crossed with a straight wire using an AL2 catheter, a venoarterial loop was created, and a Torq-Veu 6-F catheter (St. Jude Medical, St. Paul, Minnesota) was advanced over the loop through the leak. An Amplatzer Vascular Plug III 10 × 5-mm device (St. Jude Medical) was deployed (Figures 1C and 1D), and the regurgitation was significantly reduced.

Post-operative recurrence of mitral valve regurgitation after mitral valve repair may occur (1). In this subgroup of patients, percutaneous treatment could be an option to avoid surgery. MitraClip implantation has been described (2), and the feasibility of ViR implantation has been reported (3). A major concern of ViR is that the valve must accommodate an asymmetric oval-shaped ring and make it circular; a distortion of the valve itself may lead to regurgitation and/or to paravalvular regurgitation because of suboptimal apposition to the ring. We describe the first-in-man percutaneous transseptal closure of paravalvular regurgitation as a result of suboptimal apposition of the valve to the ring.

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FIGURE 1 Closure of Paravalvular Regurgitation After Percutaneous ViR Implantation

(A) Transseptal valve-in-ring implantation (ViR). (B) Echocardiographic image showing paravalvular regurgitation between the ring and the valve. (C) Paravalvular leak closure with an Amplatzer Vascular Plug III device (St. Jude Medical, St. Paul, Minnesota). (D) Three-dimensional echocardiographic image showing the correct position of the device.

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