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IMAGES IN INTERVENTION

Transcatheter Aortic Valve in Failing Mechanical Aortic Valve

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Transcatheter aortic valve-in-valve (ViV) has become a feasible therapy for patients with failing bioprosthesis. At present, ViV cannot be expanded to dysfunctional mechanical valves, for which redo surgery remains the treatment of choice.

A 75-year-old man harboring a mechanical 25-mm CarboSeal (Corcym) ascending aortic prosthesis (Bentall-Bono procedure) was admitted because of type B aortic dissection (Figure 1). He was discharged 6 days later after a favorable response to medical treatment. One month later, he underwent extra-anatomic reconstruction with right common carotid artery to left subclavian artery bypass and proximal ligation with a vascular graft and end-to-side reimplantation of the right common carotid artery on the graft. Four weeks later, the endovascular procedure was performed by implantation of the NEXUS Stent Graft System (Endospan Ltd) through the right femoral artery. After unintended guidewire progression into the left ventricle, the patient evolved to cardiogenic shock and acute aortic regurgitation caused by embolization of 1 of the aortic discs (Figure 2).

Because of the extremely high risk of a redo surgery, a bailout percutaneous strategy was performed under norepinephrine infusion. Both coronary arteries were protected by wiring and stent. A Safari wire was positioned in the left ventricle and a 60-cm 24-F sheath progressed to the ascending aorta. A 24.5-mm balloon-expandable prosthesis was implanted in the mechanical prosthesis frame, crashing and trapping the remaining disc between the aortic graft and the prosthesis. The balloon was inflated over nominal volume (20 + 3 mL) (Figure 3, Video 1). A full-body computed tomography scan showed the embolized leaflet stuck in the left common iliac artery (Figure 3). Transthoracic echocardiography showed adequate performance of the prosthesis (mean gradient = 18 mm Hg, no aortic regurgitation) (Figure 3). The patient was discharged 10 days later with no signs of neurologic dysfunction; acenocumarol was switched for aspirin, and the patient remained asymptomatic at the 6-month follow-up.

To the best of our knowledge, we describe the first case of a percutaneous aortic ViV procedure for an iatrogenic dysfunctional mechanical prosthesis damaged during endovascular repair of the aortic arch, demonstrating its feasibility and the possibility to withdraw oral anticoagulation safely afterward.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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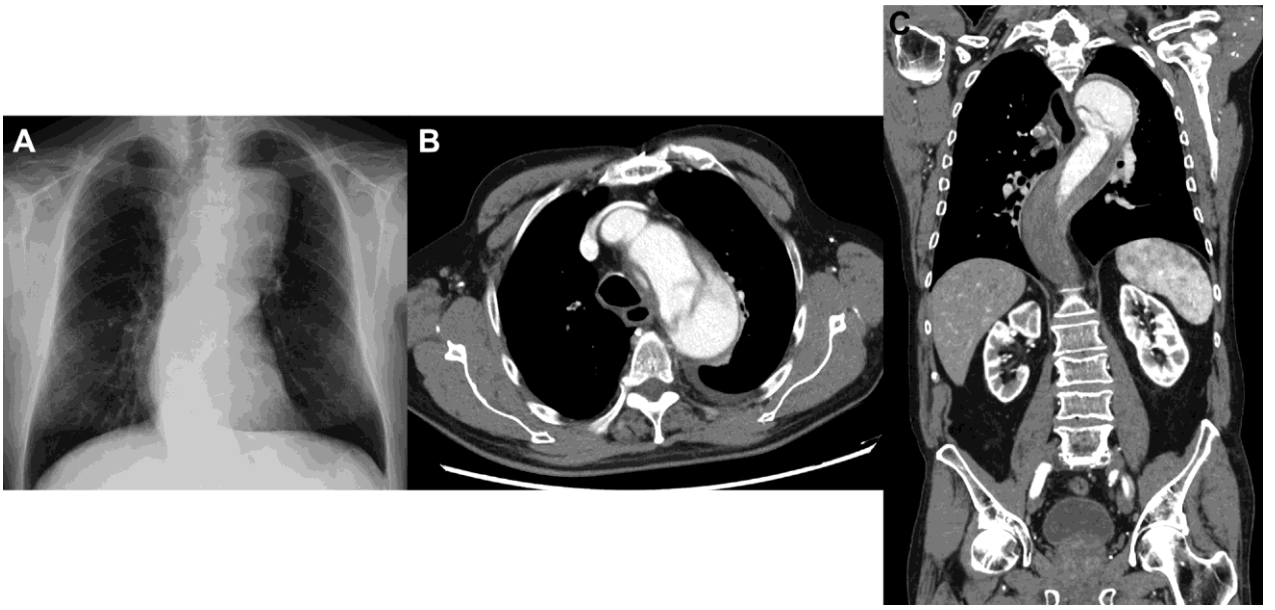
FIGURE 1 Chest X-Ray and Computed Tomography Scan



(A) Mediastinal enlargement. (B and C) Aneurysm from aortic arch to suprarenal aorta and type B dissection extending from the left subclavian artery to the left external iliac artery.

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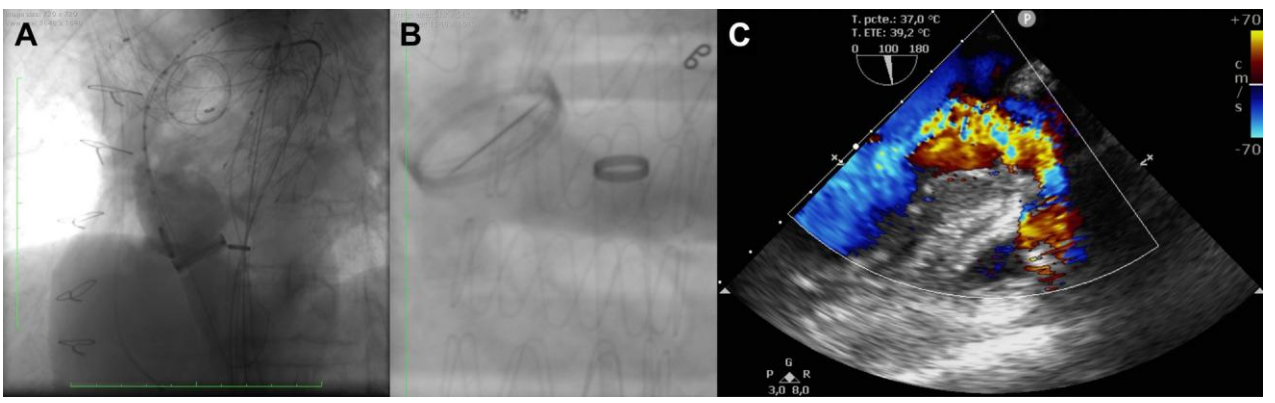
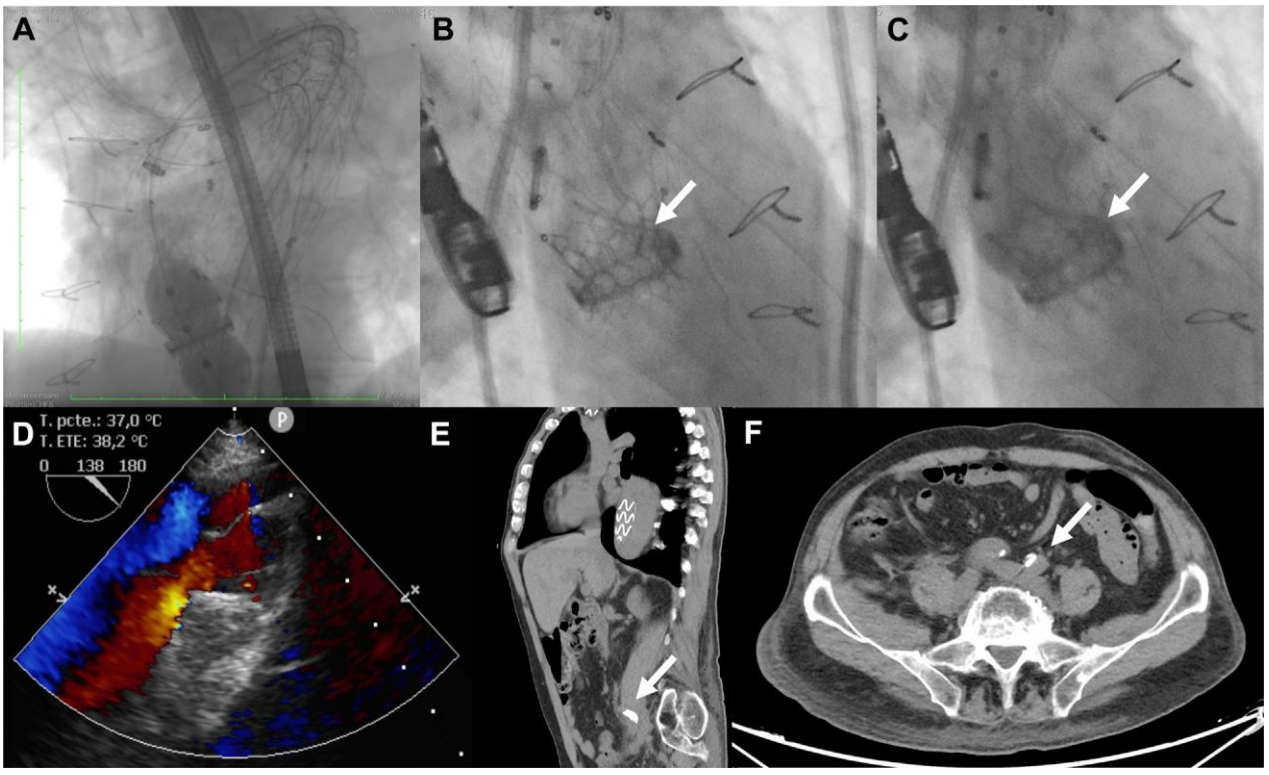
FIGURE 2 Iatrogenic Severe Aortic Regurgitation



(A) Aortography. (B) Fluoroscopy showing only 1 carbon leaflet. (C) Transesophageal echocardiography.

FIGURE 3 Valve-in-Valve Procedure and Outcomes



(A) 24.5-mm Myval (Meril Life Sciences) valve-in-valve within the mechanical prosthesis ring. (B and C) Adequate sealing with no regurgitation and remaining carbon leaflet (arrow). (D) No paravalvular regurgitation. (E and F) Embolized carbon leaflet in the left common iliac artery (arrows).

KEY WORDS aortic dissection, balloon-expandable prosthesis, mechanical aortic prosthesis, percutaneous valve-in-valve

APPENDIX For a supplemental video, please see the online version of this paper.