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Images in Cardiology

Takotsubo Cardiomyopathy Following a Transseptal Mitral Valve-in-Valve Procedure

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A 77-year-old woman with symptomatic severe mitral bioprosthetic valve regurgitation was referred for transseptal mitral valve-in-valve implantation. She had no other major comorbidity and no previous psychiatric condition. The mitral valve-in-valve procedure was successfully performed under general anesthesia (fentanyl, propofol, and rocuronium) with a 29-mm Sapien 3 transcatheter heart valve (Edwards Lifesciences LLC, Irvine, CA) implanted within a 33-mm Epic St. Jude surgical valve (Fig. 1A; Video 1, view video online). No electrocardiogram changes were noted, and the immediate post-implant transesophageal echocardiogram showed a normal left ventricular ejection fraction (LVEF), a mean mitral gradient of 4 mmHg, and no paravalvular leak.

Despite symptom improvement, a routine day-1 transthoracic echocardiogram revealed new severe antero- and infero-apical hypokinesia, with an estimated LVEF of 25%, and a mean mitral gradient of 5 mmHg without left ventricular outflow tract obstruction (Video 2, view video online). The electrocardiogram showed new inverted T waves in the anterior leads, and the QTc interval was 492 ms vs 455 ms on the pre-procedure electrocardiogram (Fig. 1B). Peak troponin was 179 ng/L (N < 9 ng/L). An urgent coronary angiogram showed normal coronaries, and the ventriculogram revealed a classical appearance of Takotsubo cardiomyopathy (Fig. 1, C and D; Video 3, view video online). No psychotropic drug or pressors had been administrated either pre- or per procedure. The in-hospital course was uneventful, and the patient was discharged at day 3. The QTc interval was 480 ms on the discharge electrocardiogram. At 1-month follow-up, transthoracic echocardiography showed complete left ventricular recovery to her baseline LVEF (50%-55%; Video 4, view video online).

Novel Teaching Points

- Takotsubo cardiomyopathy may occur after minimally invasive procedures, including transcatheter mitral valve-in-valve implantation.
- Urgent coronary angiogram is key to ruling out differential diagnosis, including coronary embolism.

Takotsubo cardiomyopathy was suspected in light of the following: (i) a new left ventricular wall motion abnormality, including apical ballooning; (ii) normal coronary angiogram; (iii) new electrocardiographic changes and troponin elevation; and (iv) the absence of myocarditis, coronary thrombus, or air embolism.

Stress-induced cardiomyopathy has been reported only rarely following transcatheter valve replacement.[1-4] Takotsubo cardiomyopathy may occur in rare cases following a mitral valve-in-valve procedure, although the mechanism remains unclear.

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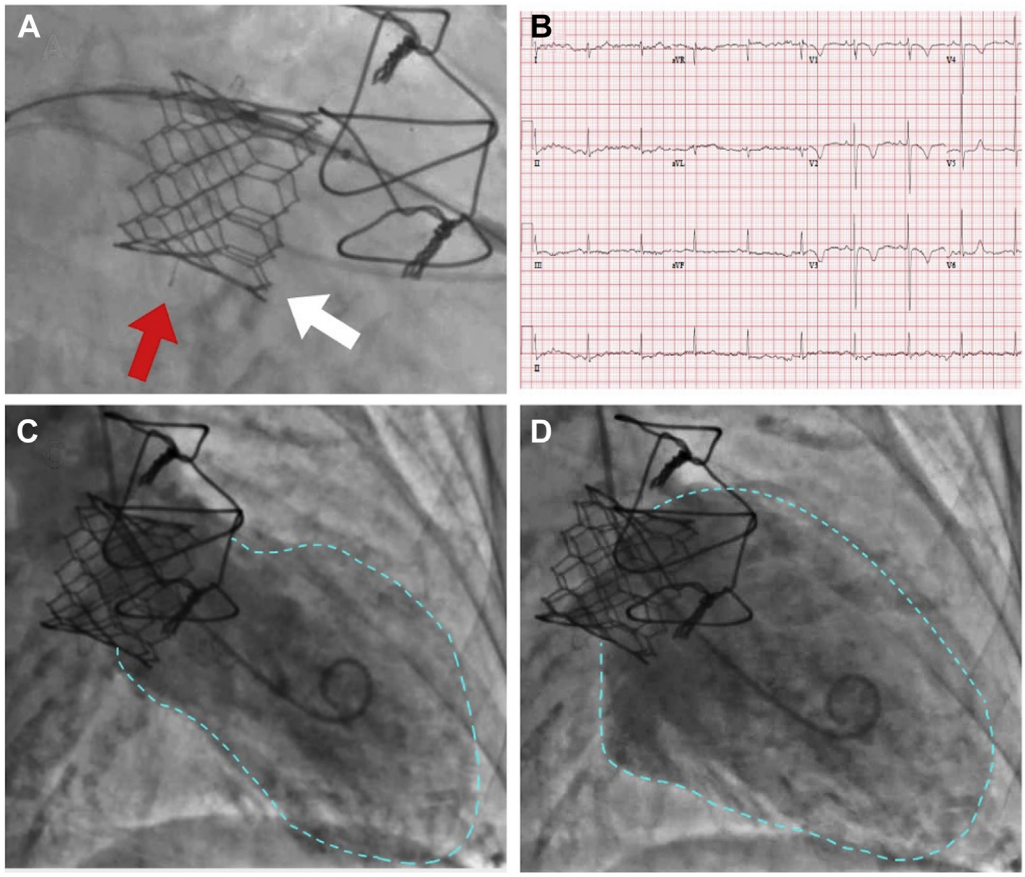

Figure 1. Fluoroscopic image, electrocardiogram tracing, and left ventriculogram after a 29-mm Sapien 3 transcatheter heart valve (Edwards Lifesciences LLC, Irvine, CA) was implanted within a 33-mm Epic St. Jude surgical valve. (**A**) Fluoroscopic image of a 29-mm Sapien 3 (**white arrow**) implanted within a 33-mm Epic St. Jude surgical valve (**red arrow**). (**B**) Electrocardiogram post-implantation demonstrating new anterior T-wave inversion. (**C-D**) Left ventriculogram demonstrating apical ballooning.

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at https://www.cjcopen.ca/ and at https://doi.org/10.1016/j.cjco.2021.12.006.