

IMAGING VIGNETTE

BEGINNER

CLINICAL VIGNETTE

Late Right Coronary Obstruction Following TAVR in a Degenerated Surgical Aortic Bioprosthetic Valve



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ABSTRACT

We present a case of an 80-year-old woman with severe aortic insufficiency due to a degenerated 21-mm biological prosthetic aortic valve implanted 9 years earlier, treated by using a transcatheter aortic valve replacement valve-in-valve procedure and who experienced a delayed right coronary obstruction. (**Level of Difficulty: Beginner.**) (J Am Coll Cardiol Case Rep 2019;1:419–20) © 2019 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

An 81-year-old woman with a 21-mm Mitroflow bioprosthetic aortic valve (Sorin Group, Milan, Italy) replacement 9 years earlier was referred for a severe symptomatic aortic regurgitation due to bioprosthesis dysfunction. The heart team planned a transcatheter aortic valve replacement valve-in-valve (ViV) procedure. A 23-mm CoreValve Evolut R prosthesis (Medtronic, Minneapolis, Minnesota) was implanted via the right transfemoral route with good immediate result (**Figure 1A**).

The patient presented a cardiogenic shock 24 h later, with no chest pain or ST-segment changes on electrocardiogram but a severe biventricular dysfunction on transthoracic echocardiography (TTE). Emergency cardiac catheterization revealed a right dominant coronary artery occlusion (**Figure 1B**). This artery was reopened by percutaneous coronary intervention, and a 4.0-mm Resolute Onyx drug-eluting stent (Medtronic) was successfully implanted through the transcatheter heart valve into the artery (**Figure 1C**).

The patient recovered progressively. At day 7, TTE revealed normal ventricular functions with a 10 mm Hg mean gradient in the aortic ViV. Multislice computed tomography imaging showed a good patency of the left and right coronaries (**Figure 1D**). At 12 months, the patient remains asymptomatic with stable TTE parameters.

Coronary obstruction is a dramatic complication after transcatheter aortic valve replacement and is more frequent following the ViV procedure (1), with an incidence of 2.3% in the VIVID (Valve-in-Valve International Data) registry (2). This complication mostly involves the left coronary artery and occurs within minutes after implantation, but it can also occur a few hours to several months later, with a poor prognosis (3).

In the current case, 2 major parameters led to this complication. The first was the presence of a Mitroflow valve with leaflets mounted externally of the stent (2). The second factor was the tight aortic root anatomy with

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Manuscript received May 14, 2019; revised manuscript received July 8, 2019, accepted July 11, 2019.

**ABBREVIATIONS
AND ACRONYMS**

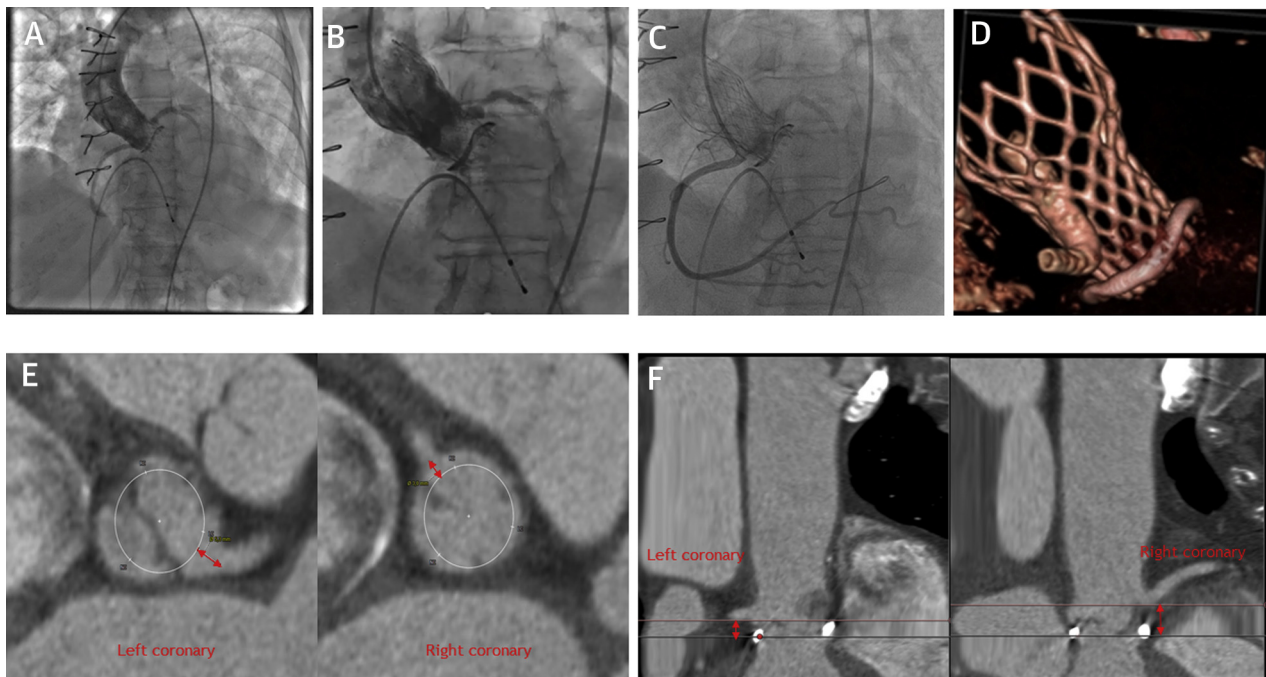
TTE = transthoracic
echocardiography

ViV = valve-in-valve

a short virtual transcatheter valve to coronary ostium distance (**Figure 1E**), the most powerful predictive factor for coronary occlusion after ViV procedure, with an optimal cutoff level of 4 mm (**2**) and a short annulus-coronary ostia distance (**Figure 1F**).

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FIGURE 1 Angiographic Views of Immediate Result and Right Coronary Reopening and Pre- and Post-Procedural MSCT



(A) Transcatheter aortic valve replacement implantation outcome: no aortic regurgitation and both coronary arteries patent. **(B)** Aortogram showing an occlusion of the right coronary artery. **(C)** Stent implantation outcome: good patency of the right coronary artery. **(D)** Multislice computed tomography (MSCT) reconstruction of stent implantation through a 23-mm CoreValve Evolut R in a Mitroflow bioprosthesis. **(E)** Virtual transcatheter valve to coronary ostium distance: 5.3 mm and 3 mm to the left and right ostium, respectively. **(F)** Annulus-coronary ostia distance: 4 mm and 10 mm to the left and right ostium, respectively.

REFERENCES

1. Ribeiro HB, Webb JG, Makkar RR, et al. Predictive factors, management, and clinical outcomes of coronary obstruction following transcatheter aortic valve implantation: insights from a large multicenter registry. *J Am Coll Cardiol* 2013;62:1552-62.
2. Ribeiro HB, Rodes-Cabau J, Blanke P, et al. Incidence, predictors, and clinical outcomes of

coronary obstruction following transcatheter aortic valve replacement for degenerative bioprosthetic surgical valves: insights from the VIVID registry. *Eur Heart J* 2018;39:687-95.

3. Jabbour RJ, Tanaka A, Finkelstein A, et al. Delayed coronary obstruction after transcatheter aortic valve replacement. *J Am Coll Cardiol* 2018;71:1513-24.

KEY WORDS aortic valve, complication, percutaneous coronary intervention