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Delayed distal migration of a balloon expandable valve-in-valve transcatheter aortic valve: a clinical case and review of the literature

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Case Presentation: A 70 year old man presented with recurrent dyspnea and new decrease in his left ventricular ejection fraction 5 months following valve-in-valve (ViV) TAVR (26 mm). A TEE revealed migration of his ViV TAVR towards the left ventricular outflow tract (LVOT) with resultant severe paravalvular leak (Figure 1A, 1B, 1C; yellow arrow showing the TAVR, red arrow showing the previously implanted bioprosthetic surgical aortic valve). A 29 mm balloon expandable TAVR was placed and deployed higher to ensure anchoring of the device and adequate sealing of the area of paravalvular leak (Figure 1D, 1E, 1F). This resulted in resolution of regurgitation with an intraoperative transvalvular gradient of 10 mmHg. At his 3-month follow-up visit, a TTE showed a well-seated TAVR with mild paravalvular leak and a mean gradient of 17 mmHg. He successfully completed cardiac rehab and his dyspnea improved to mild.

Discussion

As the population ages and younger patients receive surgical aortic bioprostheses (SAVR), the rates of deteriorated SAVR's is only expected to grow in the future. The use of TAVR is now established as an alternative to redo surgery in patients with deteriorated SAVR"s, therefore, it is crucial to be able to recognize and treat device-related complications in a timely manner. The occurrence of distal migration of TAVR, i.e. displacement of the device towards the LVOT, is rare. The vast majority of cases are noted intra-procedurally; few delayed cases have also been reported, the latest being 3 years after placement. Device migration can lead to various complications, namely obstruction of the coronary ostia and myocardial infarction, severe paravalvular regurgitation and depending on the geometry of the LVOT and the mitral valve, the displaced device may impinge on the anterior leaflet of the mitral valve and cause severe mitral regurgitation. Treatment options include either open surgical removal of the migrated valve and placement of a SAVR or implantation of a ViV TAVR. The decision should be personalized after accounting for patient and device-related characteristics: the patient's overall STS score, the presence and severity of LVOT calcification, uniformity and extent of aortic leaflet calcifications, height of the coronary ostia, optimal valve sizing and expansion and coaxial positioning of the TAVR. Prompt recognition and management of TAVR migration is critical to ensure optimal short and long-term outcomes in TAVR patients, especially as the indication of use keeps expanding and as TAVR recipients keep getting younger.

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