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Commentary: Diamonds are forever: Not so for transcatheter aortic valve replacement

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CENTRAL MESSAGE

The risks associated with TAVR explant are not negligible and compel the clinician to re-evaluate prosthetic choice (TAVR vs SAVR) for the initial procedure.

Data on the long-term durability of transcatheter aortic valve replacement (TAVR) prostheses after 5 years are limited. With the expansion of TAVR indications across all surgical risk categories, it is expected that there will be an increase in the number of TAVR reinterventions. The optimal type of procedure (repeat TAVR vs surgical TAVR explant and surgical aortic valve replacement [SAVR]) among failed TAVR prostheses is undetermined.

In this issue of the *Journal*, Fukuhara and colleagues¹ report the Michigan statewide experience with aortic prosthesis reintervention after TAVR. From 2012 to 2019, a total of 9694 patients underwent TAVR, and 87 patients (0.90%) needed a reintervention on the TAVR prosthesis ($n = 34$ were surgical TAVR explants, and $n = 53$ underwent repeat TAVR). Not surprisingly, the authors report a significant increase in TAVR explant rates during the study period. Reintervention after TAVR was proportionally more frequent in self-expanding valves compared with balloon-expanding valves (1.19% vs 0.70%; $P = .012$), driven by a greater rate of surgical TAVR explant (0.58% vs 0.19%; $P = .001$) among self-expanding valves. The rate of 30-day mortality was 15% in the TAVR explant group, although numbers were too small to elicit meaningful differences between patients with balloon- and self-expanding valves.

There are 2 major take-home messages from the study by Fukuhara and colleagues.¹ First, the risk of reintervention after TAVR is consistently reported to be less than 1%, as published by Fukuhara and colleagues,¹ and shown by others.^{2,3} As Fukuhara and colleagues¹ acknowledge, these rates do not reflect the true incidence of structural valve deterioration and TAVR prosthesis durability, as patients undergoing reintervention (either repeat TAVR or surgical TAVR explant and SAVR) are highly selected. Stated differently, there is likely to be a sizeable cohort of patients with failing TAVR prostheses, in Michigan and other jurisdictions, who are not candidates for any reintervention. Second, approximately 40% of patients who underwent reintervention required a surgical TAVR explant and SAVR, mainly due to anatomical reasons (coronary anatomy and small TAVR prosthesis size). These patients had a 15% risk of operative mortality; this rate was similar to that previously reported for TAVR explant patients who were not candidates for repeat TAVR.^{3,4} These data are in noticeable contrast to the outcomes reported following reoperative SAVR among patients with failed surgical bioprosthetic valves, which can be performed in high-volume centers with an operative mortality of <3%, despite many patients requiring aortic annular enlargement.^{5,6}

The analysis by Fukuhara and colleagues¹ compels us to recognize the colossal importance of the index procedure that is chosen for the first AVR in the patient with aortic stenosis. This is especially valid for patients with low surgical risk, who are likely to outlive their prosthesis and require multiple reinterventions. The low-risk patient with aortic

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stenosis who is a candidate for both TAVR and SAVR can certainly be offered a low-risk TAVR with excellent early outcome, but they then become a high-risk patient for the inevitable reintervention if concomitant surgical procedures or a TAVR explant is required. Although early repeat TAVR outcomes are excellent in the study by Fukuhara and colleagues,¹ long-term durability (after 1 year) of TAVR-in-TAVR prostheses was not reported. This is highly relevant, as there are increasing reports of a greater risk of leaflet thrombosis and accelerated structural valve deterioration in TAVR-in-TAVR prostheses.^{7,8}

Fukuhara and colleagues¹ also report that patients with self-expanding prostheses requiring reintervention are more likely to undergo TAVR explant compared with patients with balloon-expanding prostheses. The data unfortunately are not granular enough to allow us to draw meaningful conclusions. Is the risk of coronary obstruction greater after repeat TAVR in self-expanding prosthesis due to their supra-annular position? Are self-expanding prostheses a marker for small aortic annuli precluding repeat TAVR? Do coronary access difficulties associated with self-expanding prostheses lead to a greater referral for TAVR explant and concomitant coronary artery bypass graft surgery? These questions ultimately remain unanswered.

The study by Fukuhara and colleagues¹ provides a real-world glance into the fate that can be expected from

TAVR prostheses and ultimately leads us to re-evaluate the risk–benefit conversation with the patient with aortic stenosis regarding which index procedure (TAVR vs SAVR) is best, especially for those who are younger and have a low-risk profile.

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