was beneficial in this patient because her porcelain aorta made crossclamping prohibitive. It could also be less risky in conventional redo cases of patients who have had previous grafting.²

As the popularity of TAVR procedures continues to rise and the established levels of risk that warrant the procedure decrease, there will be an inherent increase in TAMVI. This is particularly fortunate for those who have failure of repairs and bioprosthetic valves. This is the first reported transapical approach for double valve-in-valve TAMVI without

bypass. As the scope of transcatheter valve expands, it is without doubt that there will be extension of care to those in all risk strata.

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EDITORIAL COMMENTARY

Double transcatheter valve-in-valve therapy: A viable alternative for high-risk patients

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See related article on pages e15-7.

Transcatheter valve therapies have revolutionized the way in which structural heart disease is treated in patient populations ineligible for operation or with high surgical risk. Beginning with the results of the Placement of Aortic Transcatheter Valve Trial (PARTNER 1), numerous studies have shown a survival benefit in inoperable and high-risk surgical candidates with aortic stenosis.¹ Since those initial reports, this technology has seen tremendous progress, with improvements resulting in smaller catheters and advancements in valve design aimed at decreasing paravalvular leaks. Rapid technologic advancement, coupled with refinement in implantation procedures, has led to expanded use of transcatheter valves in the mitral valve position and for a variety of pathologies.

As a result of early success in patients at high risk, investigators began placing transcatheter valves within previously implanted but deteriorating aortic valve bioprostheses.²

Success with this technique led to the formation of an international registry investigating the outcomes of valve-in-valve implantations.³ In this large, multi-institutional registry, valve-in-valve procedures were associated with a 7.6% mortality and a 1.7% rate of stroke. Subsequent case reports have since appeared in the surgical literature detailing simultaneous valve-in-valve procedures for failing bioprostheses for both the aortic and mitral positions. Case reports have also appeared of simultaneous valve-in-valve procedures performed for failing mitral and aortic bioprostheses. All these procedures have heretofore been performed with the assistance of cardiopulmonary bypass.

Akujuo and colleagues³ have added to the surgical literature by reporting a double valve-in-valve procedure in an 86-year-old woman who was not a candidate for operation, and they are to be congratulated on their clinical decision making and the ultimate outcome. Their article in this issue of the *Journal* is the first report of such a procedure being done without the use of cardiopulmonary bypass. Because of the patient's porcelain aorta, she was clearly at high risk and had few other viable options for management. In addition, the postprocedural echocardiographic follow-up demonstrated resolution of her valvular stenoses with

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acceptable gradients across her aortic and mitral transcatheter valves.

Although valve-in-valve procedures should no doubt be the procedure of choice for patients who are not operative candidates and are likely to be the treatment of choice for high-risk patients as well, caution should be used when applying results in these patient populations to other risk strata. Valve-in-valve procedures are not without drawbacks, and higher mean transvalvular gradients have been reported after valve-in-valve procedures. More than 30% of patients in the registry of aortic valve-in-valve procedures have been reported to have severe patient–prosthesis mismatch postoperatively.⁴ Patient–prosthesis mismatch is strongly associated with the implantation of smaller valves at the first operation and with balloon-expandable valves. Those facts should remind physicians

involved in treating structural heart disease of 2 things: (1) it is imperative to implant large valves during the first operation and (2) open reoperative valve operations may be preferable for patients at low or moderate risk.

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