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Commentary: Trial and error—Is the transatrial approach the silver bullet for transcatheter mitral valve replacement in mitral annular calcification?

Sameer A. Hirji, MD, MPH,^a and Tom C. Nguyen, MD^b

Mitral annular calcification (MAC) poses a persistent diagnostic and management challenge in both the surgical and transcatheter landscape. A recent analysis demonstrated that the presence of MAC alone, regardless of severity, was independently associated with increased operative mortality and adverse postoperative outcomes after surgical mitral valve replacement.¹ Parallel findings have been reported for transcatheter mitral valve replacement (TMVR) and severe MAC.² In this regard, the role of TMVR in MAC is still debated, given the worse mortality and widespread concerns regarding left ventricular outflow tract (LVOT) obstruction, paravalvular leak (PVL), embolization, and valve migration.^{2,3} These concerns, however, have been an impetus for clinicians to constantly challenge their technical horizons to chisel precisely, through trial and error, the silver bullet in terms of the most optimal TMVR access route.

We read with interest the article by Vodstrup and colleagues⁴ in this issue of the *Journal*. They describe a first-in-human case of transatrial TMVR with an inverted 23 Edwards Intuity Elite (Edwards Lifesciences, Irvine, Calif)

From the ^aDivision of Cardiac Surgery, Department of Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, Mass; and ^bDepartment of Cardiothoracic and Vascular Surgery, University of Texas Health Science Center, McGovern Medical School, Houston, Tex.

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Address for reprints: Tom C. Nguyen, MD, Department of Cardiothoracic and Vascular Surgery, University of Texas Health Science Center, McGovern Medical School, Houston, TX 77030 (E-mail: tom.c.nguyen@gmail.com).

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Sameer A. Hirji, MD, MPH (left), and Tom C. Nguyen, MD (right)

CENTRAL MESSAGE

Transcatheter mitral valve replacement in mitral annular calcification is associated with worse outcomes, but outcomes after transatrial access appear promising, and it should be considered.

rapid-deployment valve (as opposed to using a TAVR valve in the mitral position) in a 72-year-old woman with severe circumferential MAC. Postoperatively, the valve appeared to be well seated, without PVL or compromise of the adjacent TAVR valve in the aortic position, but with some degree of anatomic LVOT. This article exudes both technical prowess and innovation, and we commend Vodstrup and colleagues⁴ for their unique approach given the challenging anatomy, albeit slightly overshadowed by the patient's minor stroke complication. Nonetheless, this article provides some food for thought, particularly with respect to their valve choice. An inverted TAVR valve in the mitral position would have likely increased the risk of LVOT with inherent displacement of the existing Evolut TAVR valve (Medtronic, Minneapolis, Minn). Although the new valve provided better anchorage and sealing to prevent PVL, it could not be dilated into the calcium, resulting in placement of a small-sized valve with resultant moderate mitral stenosis.

Despite these limitations, this is an important addition to the growing armamentarium of studies that demonstrate the possible efficacy of transatrial TMVR in MAC.^{3,5} The transatrial approach may provide improved sealing to minimize PVL, better anchorage to mitigate valve migration, and, importantly, a better landing target to reduce LVOT, as observed in the study of Vodstrup and colleagues.⁴ Contrastingly, transseptal access may limit maneuvers in the left atrial and compromise valve positioning given the

angled mitral annular plane, while transapical access may be limited by the myocardial tissue damage, particularly in elderly and frail patients.^{3,5} The superiority of transatrial TMVR access in MAC was evident in the Global Multi-center Registry Analysis, in which the transatrial approach was used in 20% of the patients and was associated with higher technical success and significantly lower odds of 1-year mortality (almost 2.5-fold less) relative to the transapical and transseptal approaches.³ Although the definitive role of TMVR in patients with MAC requires further evaluation in clinical trials, it represents an opportunity for development, innovation, and technical refinements through trial and error until we find the silver bullet.

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