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Commentary: Conduction disturbances following self-expanding transcatheter aortic valve replacement—mission far from accomplished

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Conduction disturbances after transcatheter aortic valve replacement (TAVR) have proven to be a significant problem that need to be overcome to optimize transcatheter aortic valve replacement. Although the technical aspects of TAVR have been significantly more streamlined with improved delivery systems, the rates of conduction disturbances remain unsettlingly high, as quoted in the manuscript of 17.4% at 30 days and 19.4% at 12 months in the low-risk self-expanding valve trial.¹ The effects of new left bundle branch block and need for permanent pacemaker have demonstrated deleterious effects on left ventricular function and progression to heart failure.²⁻⁴ Rates of left bundle branch block and need for permanent pacemaker have been significantly greater in TAVR than in surgical valve replacement, and as the indications for TAVR continue to expand, the effects of conduction disturbances will become more pronounced as their effects are made more evident in patients with longer life expectancies.⁵ For TAVR to continue to make strides toward becoming a first-line treatment for severe aortic stenosis in younger

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CENTRAL MESSAGE

Preoperative assessment of the length of the membranous septum and intraoperative adjustment of implantation depth may lead to decreased conduction abnormalities after self-expanding TAVR.

and healthier patients, conduction disturbances need to be addressed and decreased.

Chen and colleagues⁶ should be congratulated for their attempt to evaluate and remedy a technical problem with a technical solution. The key to any attempt to solve this issue is that the measurements must be reproducible and able to be obtained with routine imaging that is used for TAVR evaluation. The measurements that the authors study, membranous septum (MS) length in the coronal view and infra-annular MS length from the stretched vessel image, can be obtained from a gated computed tomography angiogram that is used for TAVR evaluation.

The second part of a truly viable solution requires that the image measurements obtained can be applied and executed to the procedure. Even if we can do a great evaluation of the membranous septum and know who is at risk for conduction disturbances and where exactly we want to land the valve, are we actually able to precisely achieve this technical goal in the operating room? The study has not addressed this aspect, as the measurements and results were performed and analyzed retrospectively. The description of the technical aspects the authors employ for the procedure as well as their analysis of the implantation depth, coronal MS length, and coronal membranous septum implantation depth are interesting, but we have yet to be able to deploy the valves with such precision with respect to the membranous septum. The data

presented and motivation behind the study are valuable and serve as goals to achieve as the precision of valve positioning will improve with time as the delivery systems continue to evolve and the experience of the surgeons and cardiologists performing the procedure grows. As the authors state, the issue at hand is a balance between the risk of valve pop-out with subsequent need to recapture, which risks embolic events or complete valve migration and the risk of conduction disturbances.

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