Commentary: How (and why) to make it mini

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Central Message

With the increased use of transcatheter technology in the treatment of structural heart disease, it becomes increasingly important for surgeons to add minimally invasive approaches to their armamentarium.

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The management of structural heart disease, specifically for the treatment of aortic stenosis and mitral regurgitation, has radically changed over the past decade. Before the development of transcatheter valve techniques, more than 80% of all surgeries were performed via a traditional median sternotomy. In the current climate of less-invasive options and Internet accessibility, patients are increasingly searching for minimally invasive therapy options for their valve disease. However, minimally invasive surgical techniques are used in a minority of cases performed in the United States. In a recent analysis of the Society of Thoracic Surgeons database from 2011 to 2016,¹ isolated minimally invasive mitral valve surgery was performed in only 23% of patients (32.4% in patients with degenerative prolapse); a small increase from the 20% reported in 2008.² Unlike mitral valve surgery performed via a conventional sternotomy, minimally invasive mitral or aortic surgery involves a deviation from normal operating room environments that affect not only the surgeon and assistant, but also the entire operating team, including members representing anesthesia, nursing, and perfusion. We see this as the major barrier to its uptake.

The primary goal of mitral valve surgery for degenerative disease should be a durable repair. It must be remembered that the gold standards of mitral valve repair set by Carpentier³ and David and colleagues⁴ were performed primarily through a sternotomy. However, because several less-invasive transcatheter technologies using transapical and transseptal access are currently in early feasibility or pivotal trials in the United States, surgeons will need to improve the appeal of the treatment we offer. Minimally invasive mitral surgery provides a level of invasiveness more acceptable to patients and a durable repair using contemporary valve repair techniques.

The evidence for minimally invasive mitral valve surgery is limited to single institution data. Large series and propensity-matched cohorts confirm safety and suggest satisfactory longer-term durability compared with sternotomy and there appears to be only a modest difference in

the length of stay.⁵⁻⁸ Further, pain scores are reduced and there may be a faster return to normal activities.^{9,10}

Nissen and colleagues¹¹ elegantly describe the establishment of a minimally invasive valve surgery program. Whilst the authors do not report clinical outcomes, we suspect that increasing annual procedure volume must reflect their program's success. We agree with their key points on establishment of a consistent, high-quality team, good patient selection (both the clinical and anatomic characteristics as assessed with computed tomography of the chest and pelvis as standard of care), and training with subsequent mentorship. We agree with the authors that the most important aspect of a minimally invasive valve program should remain clinical outcomes and an unwavering pursuit of excellence.

With the development of a structural valve heart team at most institutions, we foresee that practice patterns in the future will change from referral to a single cardiologist or surgeon to direction to a center with a multidisciplinary valve team. This team should have shared leadership amongst surgeons and cardiologists (interventional, imaging, and noninterventional) and with active involvement of anesthesia and nursing staff. Such a team is best placed to select the ideal treatment for each patient within the experience of each hospital network. We believe that this team should be able to provide a patient with all 3 options for care of valve disease: traditional median sternotomy, minimally invasive, and transcatheter technologies.

The treatment of valvular heart disease is advancing rapidly using transcatheter techniques. If surgeons want to stay in the race for the management of heart disease in these patients, they must advance their skills to provide durable outcomes using minimally invasive surgical valve techniques.

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