MINIMALLY INVASIVE CARDIAC SURGERY AND THE IMPORTANCE OF QUALITATIVE PATIENT-CENTERED METRICS TO GUIDE INNOVATIONS

Reply to the Editor:

As transcatheter aortic valve replacement (AVR) has grown, and the benefits of percutaneous techniques have been realized, surgeons have explored less invasive approaches to perform surgical AVR (SAVR). Some argue that minimally invasive SAVR is the optimal approach, because it minimizes surgical trauma while achieving complete resection of a diseased aortic valve, as opposed to crushing it by transcatheter AVR deployment.1 Interestingly, a recent randomized trial by Nair and colleagues demonstrated no apparent clinical benefits with minimally invasive SAVR at the expense of increased costs. The results of that study and Fedak’s recent editorial1 have fueled further debate as to whether there is any advantage to minimally invasive techniques at all.

The letter by Percy and colleagues is of particular interest. We agree with the argument that it is difficult to show differences in safety and efficacy outcomes between ministernotomy and full sternotomy AVR. In experienced hands, both approaches are likely safe and effective when compared for traditional clinical end points. We must be cautious, however, and not dismiss emerging unvalidated minimally invasive techniques if they fail to demonstrate superiority when assessed by these end points. Qualitative measures may be important to assess further the values, beliefs, and attitudes of patients who must choose from a variety of interventions, including transcatheter AVR.

More qualitative outcome measures, such as pain, functional disability, and overall patient satisfaction, may be more valuable to assess the subtle but still relevant differences between equally safe and effective operative techniques. We must encourage such end points in the design of our clinical studies to evaluate minimally invasive approaches. The time to full physical and mental recovery after open-surgery is meaningful to patients but often underappreciated by caregivers. Much of the limitation to early functional recovery after SAVR involves activity restrictions related to sternal precautions. These restrictions limit mobility, activity, return to work, and patient satisfaction. The right anterior minithoracotomy approach for mini-SAVR is established and described.4 In our growing experience with right anterior minithoracotomy, we find that patients have minimal postoperative pain, need infrequent blood transfusion, and are often discharged early. By avoiding sternal precautions, they can return to physical activity much earlier. To date, experience with this technique is limited, and robust outcome data are lacking, but reports from high-volume centers with expertise in right anterior minithoracotomy are encouraging.5

Avoiding sternal precautions is an important goal to achieve after SAVR. This simple and straightforward patient-centered target may have the greatest potential to accelerate functional recovery and provide optimal patient satisfaction. We will develop a rigorous multimodal research platform to explore innovations to enhance and accelerate recovery after heart surgery. Our work will be guided by qualitative outcomes as primary end points. We use a right anterior mini thoracotomy approach for mini-SAVR for complete sternum sparing, which facilitates enhanced functional recovery. For redo operations or for those patients who are not candidates for mini-SAVR, we continue to develop adhesive-enhanced sutureless closure methods, with a novel bone adhesive compound to achieve rapid bony stabilization and eliminate the need for sternal precautions (NCT03365843).6,7

References

To the Editor:

I read with great interest the recently published meta-analysis of Diaz and colleagues, which establishes that relative to biologic valves, mechanical prostheses provide a survival benefit for patients aged 50 to 70 years who undergo aortic valve replacement (4886 patients from 5 studies).

I believe that this study has a number of important limitations that should be highlighted. The first one is due to its design. The protocol that was published in the PROSPERO database (registry number CRD42017076611) established as inclusion criteria only propensity score–matched (PSM) studies or randomized controlled trials. This design prevented the inclusion of the study by Goldstone and associates, the largest study published to date (9942 patients), because confounding factors that have not yet been properly studied. I therefore believe that knowing the real-world results in different regions or countries provides more knowledge than a weighted average of all the studies, because the environment exerts an influence impossible to quantify.

Recently, my group has led the Andalusian Aortic Valve Multicentric (ANDALVALVE) Study, a multicentric retrospective study including all subjects aged 50 to 65 years who underwent primary isolated aortic valve replacement for severe aortic stenosis at all hospitals within Andalusia, Spain (population, 8,500,000 people) between 2000 and 2015. A total of 1443 patients were enrolled. After propensity score matching, our study showed similar long-term survivals for patients older than 55 years. A National extension comprising 30 hospitals in Spain is underway (SPAVALVE, ClinicalTrials.gov NCT03595423).

Emiliano A. Rodríguez-Caulo, MD, PhD, FETCS
Heart Area
Cardiovascular Surgery Division
University Hospital Virgen de la Victoria
Málag, Spain
CIBERCV Cardiovascular Diseases
Health Institute Carlos III
Madrid, Spain

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