Comparison of Bioprostheses in Patients With Small Aortic Annulus

I am writing to comment on the study by Botzenhardt et al. (1) in a recent issue of the Journal.

This interesting report compared different forms of bioprostheses, particularly in the small annular sizes for the aortic root. My reason for writing is related to the conclusion and the discussion regarding patients, particularly elderly ones, who need aortic valve replacement and who have relatively small annular diameters, namely 19, 21, or 23 mm. I would disagree with the authors’ conclusions that “especially older women who often present with narrow left ventricular outflow tracts small aortic annulus and therefore a surgical procedure in this patient group, according to our results properly require root enlargement.” I would like to emphasize strongly that this is a somewhat hazardous recommendation, particularly in the elderly who have many other comorbidities and where a prolonged operation could lead to increased morbidity and even mortality. The researchers quote recommendations by the American College of Cardiology that the surgical procedure in this patient group should be a root enlargement. I strongly suggest that many of us who deal with these very frail elderly and oftentimes very sick patients would do well to implant these newer forms of more hemodynamically efficient bioprostheses, as mentioned in their study, even in the 19-mm range rather than extensive root enlargements for theoretical hemodynamic gain.

Increasing numbers of elderly patients (numbering some 50 million by the year 2015) will require aortic valve replacement. We must devise strategies and use the best bioprostheses in this group to get patients through surgery and improve their hemodynamics, while balancing the risk and reward of these procedures.

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REPLY

Our study about four stented bioprostheses implanted in patients with a small aortic annulus observed high incidences of patient–prosthesis mismatch in subjects with an aortic annulus of 18 to 20 mm independent of the chosen valve type (1). These patients may hemodynamically benefit from aortic root enlargement and the implantation of a larger stented bioprosthesis. However, the decision to extend the operative procedure from an isolated aortic valve replacement to valve replacement plus root enlargement, which may lead to increased morbidity and mortality (2), must always be integrated in a differentiated and extensive assessment of the patient’s comorbidities, age, and lifestyle and must not be misunderstood as a general recommendation. Prolongation of the cardiopulmonary bypass time may be especially associated with increased operative and 30-day mortality in patients ≥80 years of age (3).

Thus, we concur with Dr. Cohn that “we must devise strategies and use the best bioprostheses in this group to get patients through surgery and improve their hemodynamics, while balancing the risk and reward of these procedures.” We emphasized this concept with reference to the American College of Cardiology/American Heart Association (ACC/AHA) guidelines for the management of patients with valvular heart disease: “A narrow LV [left ventricular] outflow tract and a small aortic annulus sometimes present in elderly women may require enlargement of the annulus. The decision to proceed with valve replacement depends on an imprecise analysis that considers the balance between the potential for improved symptoms and survival and the morbidity and mortality of surgery” (4). We did not cite these guidelines to support the widespread use of aortic root enlargement. The operative procedure at our department reflects the integration of investigational results in real-world surgery, as “we do not always perform aortic root enlargement in case of patient–prosthesis mismatch in this patient group, setting priority to achieve low rates of perioperative adverse events. However, we sometimes have to accept suboptimal hemodynamic performance” (1).

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REFERENCES


The Morphed Specialist—An Andro sphinx?

Dr. DeMaria in his editorial (1) on the morphing of cardiovascular specialists rightly points out that there will be a blurring of the borders between specialties. Newer technological developments

will render the diagnosis of coronary pathology less risky; however, these are still diagnostic procedures—and there still remains the problem of treating these lesions—a problem with which we still grapple. Although Dr. DeMaria's editorial elegantly describes the roles of the cardiologist and the radiologist in specialty training and the delivery of services, one must also consider the role of the cardiac surgeon as the specialty evolves.

The only constant factor about the specialty is change. The introduction of percutaneous techniques that address mitral regurgitation is akin to the situation when balloon mitral valvuloplasty was introduced in an era where surgical mitral valvotomy was the norm for mitral stenosis.

One needs only to examine a severely calcific aortic or mitral valve to realize that replacing such valves involves far more than a simple percutaneous substitution. Various issues require resolution prior to the clinical application of these approaches. These include the problem of the small aortic root, peripheral vascular access for the introduction of larger delivery systems, determination of device blowout pressures, quantification and limitation of blood loss, backup procedures, and others (2). These difficult procedures are intolerant to the smallest error of judgment or technique. The potential pressure to adopt new technological advances could be detrimental and may encourage premature application of some technologies before their role and limitations are clearly established.

Beyond percutaneous valvular techniques, perhaps the biggest changes will occur in the interventional approaches to the ablation/isolation of atrial fibrillation and the novel interventional techniques that address the failing heart.

Immaterial of what we call the “new animal” and no matter what skills the “morphed” cardiologist may possess, there are problems that he or she must surmount. The combination of cardiological and radiological skills might not be necessarily adequate to handle high-risk patients—the presence of surgical skills might also be called for.

Beneath all this, of course, are patients who are now less forgiving and less tolerant of complications arising as a consequence of any procedure, let alone a novel intervention. The accumulation of good evidence is then a natural prerequisite to the more widespread application of these procedures in clinical practice.

It is critical, however, that we anticipate these future changes, and Dr. DeMaria should be congratulated for doing exactly this and recognizing the need for change in the way we train and deliver holistic cardiovascular services.

Finally, Dr. DeMaria suggests that the morphing of cardiovascular specialists will be consistent with the apparently widely held current concept that it is better to know everything about something than something about everything. But this in itself is a hugely time-dependent phenomenon. Although it is always possible to know something about most things (if not everything), will it ever be possible to know everything about anything—let alone something?