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strategy is the most effective remains controversial, even when the infectious process is still active. In fact, most cardiac surgeons think that the use of allograft is not related to the severity of the infection but rather to the fact that this substitute has a curtain of perivalvular tissue that can be used to reconstruct the periannular structures. Rationale in favor of allografts should be based on their relatively lower reinfection rate in presence of some strains of *Staphylococcus aureus* and *Streptococcus viridans* that are known to be extremely aggressive.

The scientific community should probably reflect on the inclusion within the Duke classification of an anatomopathologic stratification of the lesions as another discriminatory criterion in the guidelines for treatment of endocarditis. Clearly, to get out of this tunnel and reach a definitive answer, we agree with Dr Bando on undertaking long-term comparative studies. The potential roads to be followed in this context include rigorous evaluations of long-term outcomes with the use of propensity score-matched analysis and randomized clinical trials, which currently are scarcely available and only focused on the comparison of early surgery versus conventional treatment for infective endocarditis.⁵

Francesco Nappi, MD^a

Cristiano Spadaccio, MD, PhD^{b,c}

^aDepartment of Cardiac Surgery

Centre Cardiologique du Nord de Saint-Denis
Paris, France

^bDepartment of Cardiothoracic Surgery

Golden Jubilee National Hospital

^cUniversity of Glasgow Institute of Cardiovascular and
Medical Sciences
Glasgow, United Kingdom

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ALLOGRAFTS REMAIN A CORNERSTONE OF SURGICAL TREATMENT OF INVASIVE AND DESTRUCTIVE AORTIC VALVE INFECTIVE ENDOCARDITIS: SURGEON AND

TECHNIQUE DO MATTER!

Supplemental material is available online.

Reply to the Editor:

We read with interest several recent articles in the *Journal* regarding the most appropriate prosthesis for aortic valve infective endocarditis (IE).¹⁻³ As a group among those with the largest experience in treating IE, we still strongly believe that allografts have an important place in treating extensive and destructive aortic valve IE.⁴ Many recent reports claim that allografts are inferior to replacement alternatives, primarily citing high mortality as an argument against their use. These investigators almost invariably have used allografts in the most severe cases, however, precluding direct comparison of outcomes with those of alternatives.^{E1-E6}

The new American Association for Thoracic Surgery consensus guidelines for IE still advocate selective roles for allografts.⁵ First, when IE is limited to the cusps, and the root and annulus are preserved after débridement, an allograft is not necessary; however, it is reasonable to implant any new prosthetic valve on the basis of normal criteria. Second, allografts are recommended for patients with severe invasive and destructive aortic valve IE; the more extensive and destructive the infection, the stronger is this argument. In 2002, Sabik and colleagues^{E7} reported our group's experience with allografts for aortic prosthetic valve IE; in-hospital mortality was 3.5%, and intermediate-term survival was comparable to that of aortic valve surgery for non-IE. We do not exclude the possibility that greater awareness of the importance of radical débridement has reduced the added benefit of allografts in this group of patients. This possibility is reflected in recommendations 5.5 and 5.6 in the latest American Association for Thoracic Surgery guidelines (Appendix E1).⁵

These operations are difficult and have the highest reported mortality of any valve surgery. Nevertheless, on the basis of our extensive experience with advanced invasive cases and patients treated with nonallograft substitutes in this situation, we remain strong believers in the superiority of allografts in that setting. Allografts are not failure proof; our experience with failed operations for IE includes dehiscence of allografts with proximal pseudoaneurysms and recurrent IE. Further, some reports raise concerns about allograft durability and the risk of allograft reoperations in general.^{E8,E9} Experience with and mastery of the

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technical aspects of these operations are essential, and this needs to be recognized so that appropriate referrals are made to manage these cases in centers of excellence.

We agree with Bando² and Nappi and Spadaccio³ that there is a need for a study comparing allograft versus prosthetic valve implantation in patients requiring extensive root reconstruction after radical débridement. There is also a need for another review of outcomes after the use of allografts for IE that includes long-term follow-up. For now, we believe that allografts are the best choice for aortic root reconstruction in patients with invasive, destructive aortic valve IE, and we answer in the affirmative the question of Nappi and colleagues¹: “Should we more often apply the maxim ‘do it once, and do it well’ in extensive IE?”

Syed T. Hussain, MD^a

Eugene H. Blackstone, MD^{a,b}

Gösta B. Pettersson, MD, PhD^a

^aDepartment of Thoracic and Cardiovascular Surgery
Heart and Vascular Institute

^bDepartment of Quantitative Health Sciences
Research Institute
Cleveland Clinic
Cleveland, Ohio

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**WEAK EVIDENCE,
STRONG OPINIONS,
AND HIGH
EXPECTATIONS**

Reply to the Editor:

Because of the low incidence of infective endocarditis (IE) requiring surgical therapy, it is unlikely that there will

be many randomized trials to form robust evidence to support specific procedural guideline recommendations. Where there are low levels of evidence, as is the case with IE, the debates in our surgical community are high, and the impact of opinions on decision making dominates (Figure 1). This becomes particularly evident when expert opinions are divided. Limitations in the available evidence necessitate the exercise of considerable degrees of judgment nuanced by opinions expressed among guidelines authors.

We agree with Bando¹ that the lack of solid evidence is the major obstacle in the establishment of consensus of surgical therapy for IE, especially with regard to the materials to be chosen. There is general agreement that either biologic or mechanical prostheses may be used to replace infected valves absent annular involvement; however, debated rages when invading abscess destroy the annulus.² The use of homografts has been regarded as surgical dogma in the setting of surgical IE, but this belief has been challenged by controversial results from recent studies, including ours.^{3,4} We also agree that for those unfamiliar with homografts, it may not have been considered the simplest solution. Indeed, proponents argued not that it is the simplest answer, but rather that it is the best.^{3,5} It should be noted, however, that even in the severe forms of root abscess, studies have shown excellent results with a minimum risk of reinfection mechanical or biologic root replacement procedures.⁶

In the presence of conflicting results among observational studies, including ours, it may be a good time to start seeking the answer the right way—through large-scale, prospective studies. Although this is easy to say, and is surely an intellectually defensible statement, the challenges will be frustrating. On the basis of our previous study, we estimated that enrollment of more than 3000 surgical patients with IE would be needed to yield adequate power to test the hypothesis that homografts are better than biologic or mechanical prostheses.⁴ What makes this even more challenging is the heterogeneity of the study group; among patients with surgical IE, those with the most controversial pathoanatomic feature—friable, destructive annulus with abscess formation—are much rarer. This poses the question of whether recruiting such large numbers of patients for such rare conditions is ever possible. This notion may conversely demonstrate that the meaningful differences in the outcomes depending on homograft versus prostheses may not be detectable at the surgeon level, or even in center-level experiences.

Nevertheless, efforts should be continued from our surgical community to get more solid answers, even if they are not randomized trials, which would likely carry an extremely high burden of financial strains and ethical conflicts dealing with these high-risk patients. Collaborating on a multicenter, prospective registry seems a more realistic solution in this regard.

It is also important to have a common language to describe the pathoanatomic features of IE. Large,

APPENDIX E1. AMERICAN ASSOCIATION FOR THORACIC SURGERY CONSENSUS GUIDELINES: SURGICAL TREATMENT OF INFECTIVE ENDOCARDITIS^{E10}

Native Aortic Valve IE (Recommendation 5-5)

Repair is seldom possible. When the disease is invasive and the annulus destroyed, reconstruction and usually root replacement are required, and many surgeons believe that an allograft is a better choice than a prosthetic valved conduit. When additional material is needed, no material has proved superior to autologous pericardium.

Prosthetic Aortic Valve IE (Recommendation 5-6)

Prosthetic valve infections often involve the sewing ring. When the infection invades the annulus behind the central fibrous body, it eventually reaches the conduction bundle and atrioventricular node, causing heart block. The more extensive and destructive the infection, the stronger is the argument in favor of an allograft over alternative conduits with prosthetic valves. In patients with advanced invasive active IE, the primary concerns are survival and cure of the infection.

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