AORTIC HOMOGRAPHS: SHOULD WE REALLY LOSE THE OPPORTUNITY?

To the Editor:

We thank Crestanello¹ for the precise analysis of our report. As rightfully stated, the results published on the long-term follow-up of cryopreserved allograft (CA) for aortic valve replacement drop a veil of uncertainty on the durability of allogenic tissue in the second decade after implantation, considering the increased rate of reoperation for structural valve degeneration and its associated risk. We agree that the use of CA should be tailored to certain categories of patients and indeed in our study the main indication for allograft implantation was infective endocarditis (IE). This reflects the guidelines from the Society of Thoracic Surgeons,^{2,3} which assigned a class IIb recommendation with a level of evidence B to the use of CA in IE. Aortic homografts are considered reasonable for native aortic valve endocarditis, particularly with periannular abscess and extensive annular or aortic wall destruction requiring aortic root replacement/reconstruction, or in cases of extensive aortic-ventricular discontinuity.⁴ The American Association for Thoracic Surgery 2016 guidelines⁵ echo these recommendations indicating CA for invasive and destructive native aortic valve IE requiring root reconstruction and replacement; however, a prosthetic biroot or prosthetic valved conduit with a mechanical or bioprosthetic valve are considered acceptable alternatives, and the choice should be guided by surgeon training and experience. As we previously pointed out, the degree of infectious involvement of annulus and aortomitral curtain should drive the prosthesis choice and operative strategy,^{6,7} and in the guidelines the use of mechanical and stented xenograft is advocated in complex IE with periannular abscess when the valve can be anchored securely to healthy and strong tissue (class IIa level of evidence B). Conversely, an allograft or a biologic tissue root has been considered preferable to a prosthetic valved conduit in case of extensive annulus destruction, extra-aortic invasion, and when radical surgery with root reconstruction is required.^{4,5} The lack

of randomized evidence weakens the argument in favor of CA, but in the context of IE the rightly mentioned potential for CA degeneration is counterweighted by the benefit in terms of resistance to reinfection, which is an even more daunting problem.

In this context, evidence of the safety and durability of biological prostheses and homograft have been widely reported. Moon and colleagues⁸ showed a reinfection rate of 2% at 10 years after aortic valve replacement for IE, with the majority of recurrences occurring within the first year. When comparing with mechanical prosthesis, they showed an equal risk of reoperation between mechanical valves versus bioprosthesis regardless to the prosthesis type. Flameng and colleagues⁹ demonstrated a low recurrence of endocarditis in homograft even in complex cases, and these results were confirmed by Svensson and colleagues,¹⁰ who suggested the long-term durability and safety of CA with the additional benefit of the best postoperative hemodynamic parameters and favorable ventricular remodeling. Finally, in prosthetic valve endocarditis, survival when using a homograft is higher than in prosthetic valves (5-year cumulative survival 88% vs 66%).¹¹

Structural valve degeneration is surely an issue that demands further research and we are currently investigating the avoidance of cryopreservation by keeping the homograft in culture media at 4°C to reduce the risk of degeneration; however, is this risk enough to lose the opportunity to provide especially young patients with a biological valve conduit with excellent hemodynamic parameters, that does not require anticoagulation therapy, and even prevents further relapses of infections?

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NO, WE SHOULD NOT LOSE THE OPPORTUNITY, BUT WE NEED ADDITIONAL RESEARCH

Reply to the Editor:

The letter of Nappi and colleagues¹ in response to my editorial commentary² on their article³ is entitled “Aortic Homografts: Should We Really Lose the Opportunity?” My answer to their question is “No, we should not.” Cryopreserved aortic homograft should be in the armamentarium of every surgeon who treats patients with endocarditis. But the real question is “Are we benefiting patients with aortic root endocarditis by replacing the root with a cryopreserved homograft?” My answer to this question is “We don’t know, additional evidence to support the theoretic advantages associated with its use is needed.” The original report of Nappi and

associates³ on 210 patients is an important contribution to the field. As Nappi and colleagues¹ point out in their letter, the evidence for or against the use of cryopreserved aortic allografts comes from nonrandomized, retrospective, observational studies (level of evidence B). Although many prestigious authors advocate their use, others have found no benefit relative to prosthetic valve conduits in terms of cure rate, infection recurrence, durability, and reoperation.^{4,5} My impression is that the key concept for the treatment of endocarditis is radical débridement of all the infected tissue, with the reconstruction method likely less important.⁶ Some of the advantages of homograft relative to prosthetic valve conduits are technical and difficult to quantify in a clinical trial, such as the use of the anterior leaflet of the mitral valve for root reconstruction. Other claimed advantages, such as improved cure rate and increased resistance to infection, need to be demonstrated conclusively. Additional research on tissue preservation strategies is also necessary to prevent calcification and prolong homograft durability. This necessary evidence will prevent us from “losing the opportunity” and advance our knowledge on the best reconstruction strategy for extensive aortic root endocarditis.

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