3. In patients without aortic root abscess, aortic root procedures were performed 46% of the time—speaking to the surgeons' comfort level with aortic root procedures.
4. In the current report, the use of homograft was excluded. The long-term outcomes would have been interesting to see.
5. Presence of root abscess or type of prosthesis made no difference in early or late outcomes after surgical management of IE.

The authors are to be applauded for their results in a complex patient population. It should also be recognized that the commendable results were likely due to the most important variables never included in statistical analysis; that is, surgeon skill and experience. In the end, the authors appropriately conclude that to reduce the risk of reinfection, “extensive and thorough debridement of all infected tissue”—not the type of prosthesis—was the most important

factor. Thus, it is not what you use but what you do that matters.

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Commentary: Regression or progression: Hominum, bovinum, porcinum?

Thomas G. Gleason, MD, MS

Clemence and colleagues¹ are to be congratulated for their report in this month's *Journal* of the University of Michigan's experience with aortic valve endocarditis using either a stented or a stentless (Freestyle; Medtronic, Inc, Minneapolis, Minn) prosthesis. This report mimics another recent study in which they compared those with and without a

Aortic annular abscess communicating into the right atrium—prosthetic valve removed.

CENTRAL MESSAGE

Stentless valves, stented valves, and homografts all have a relevant role in the surgical management of endocarditis depending on largely on the degree of tissue invasion requiring reconstruction.

root abscess, treated predominantly with either a stented or stentless bioprosthesis.² These reports are similar in that they cover the same time period and included largely the same patients. Notably, their primary conclusions were also essentially identical: emphasizing the value of

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Disclosures: Dr Gleason serves on a Medical Advisory Board for Abbott without significant remuneration.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Oct 3, 2020; revisions received Oct 3, 2020; accepted for publication Oct 5, 2020; available ahead of print Oct 10, 2020.

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J Thorac Cardiovasc Surg 2022;164:490-2
0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2020.10.013>

wide debridement and that either stented or stentless valves (implanted via modified root inclusion technique) can be successfully used regardless of the presence of a root abscess for which a bovine pericardial patch is also used to repair annular/structural defects.

There has been longstanding enthusiasm for the use of the Freestyle for various indications by the University of Michigan group under the tutelage of Dr G. Michael Deeb, who was a key member of the original Freestyle Valve Study Group and has one of the largest experiences with its use, particularly the subcoronary/modified inclusion configuration.³ Using Freestyle stentless roots in the context of endocarditis has also been embraced by many others, even in the context of highly resistant fungi.⁴⁻⁷

Clemence and colleagues¹ make a case “to operate sooner rather than later” in cases of endocarditis that meet the guidelines set forth by the American Association for Thoracic Surgery⁸ before the development of end-organ failure (eg, cardiac, liver, renal). However, presumably if one is following those guidelines, it is not entirely clear how much earlier the authors mean from the point at which a patient meets a criterion as outlined by the guideline—in other words, many of these patients have end-organ dysfunction when they establish one of the guideline criteria. Others have similarly showed the association of end-organ failure and worse outcome in the context of endocarditis,⁹ but how this necessarily impacts decision making at diagnosis or toward earlier intervention is not evident.

In describing Michigan’s paradigm shift that occurred around 2000 from using homografts to the Freestyle for endocarditis, Clemence and colleagues¹ note better accessibility and lower cost as predominant motivating factors, but they also cite a greater propensity for calcification, increased complexity of reoperation, and earlier structural valve degeneration with homografts. However, it should be clarified that head-to-head comparisons of the Freestyle with homografts with respect to these indices have been scant at best, and in the context of endocarditis management specifically, direct comparisons are nonexistent and thus such claims not substantiated.^{10,11} Alternatively, in a recent study commensurate with the latter half of the Clemence and colleagues¹ study’s era, 2011 to 2017, and in a specific cohort of patients with intravenous drug abuse (IVDA)-associated endocarditis (all with annular/root abscess necessitating full root replacement and 70% were reoperations compared with only 20% IVDA, 58% root abscess and 41% reoperations in Clemence and colleagues) in whom homografts were used exclusively, the operative and 5-year survival rates were similar at 12% and 57%¹² compared with 7% and 58%, respectively. Interestingly, when studying the rate of and indication for readmissions through mid-term follow-up after valve surgery for a large endocarditis cohort (831 patients) and comparing those patients with and without IVDA-associated endocarditis,

FIGURE 1. Aortic annular abscess communicating into the right atrium—prosthetic valve removed.

patients with a history of IVDA had a greater likelihood of recurrent endocarditis (3×) but a slightly lower incidence of heart failure readmission than the non-IVDA cases.¹³ IVDA-associated endocarditis is seen with steadily increasing prevalence,⁹ and thus resource availability vis à vis homografts versus stentless xenografts is a relevant concern.

Clemence and colleagues¹ also note that the stentless valves performed better than stented prostheses with respect to reoperation and reinfection rates, positing that this could be because “stentless valves have much less fabric material compared to the stented valve(s)[sic].” However, this conclusion may be premature if not altogether flawed because the number of patients at risk at 10 years represents less than 20% of the patients included in the series. Moreover, in the context of the modern era of stented bioprostheses, several currently on the market have less fabric associated with their constructs than the Freestyle has covering its proximal aspect.

There is uniform agreement that complete debridement of infected tissue to viable, grossly uninvolved tissues is a tenet of the intraoperative management of invasive endocarditis. Homografts offer a unique advantage over prosthetics in their flexibility to accommodate these often large, remaining defects created by the necessary extent of debridement (Figure 1). Thus, they remain a critically important resource, favored by many. However, the Michigan group has demonstrated, again, that stented and stentless bioprostheses with the adjunct of bovine pericardial patching (fresh, native pericardium may be even more cost-effective and more desirable from an antimicrobial vantage) can be a reliable alternative worth consideration within the armamentarium for invasive endocarditis.

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