Prosthetic root endocarditis treated with radical debridement and pulmonary autograft reconstruction

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Informed consent: The patient provided written informed consent for publication of their study data.

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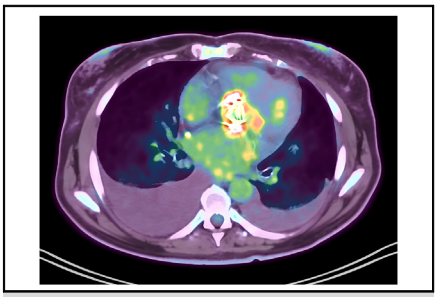

PET cardiac imaging identified 2 separate periannular abscesses.

CENTRAL MESSAGE

Although it can add operative complexity, the Ross procedure can provide good clinical outcomes for young and active patients with prosthetic aortic root endocarditis.

Video clip is available online.

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Prosthetic root endocarditis remains a challenging disease that requires thoughtful perioperative planning; aggressive debridement; and often comprehensive aortic root, left ventricular outflow tract, and central fibrous trigone reconstruction.[1] The optimal reconstructive surgical approach for prosthetic root endocarditis requires careful, patient-centered decision making and surgical expertise, but remains a subject of ongoing debate.[2] We present a challenging case of a 55-year-old female patient who had previously undergone a mechanical Bentall and hemiarch repair for bicuspid aortic valve stenosis and ascending aorta aneurysm in 2016 who presented with a stuck prosthetic valve disc, severe aortic insufficiency, congestive heart failure, and *Streptococcus salivarius* bacteremia. Transesophageal echocardiography (TEE) revealed prosthetic valve vegetations with severe prosthetic aortic stenosis and regurgitation with minimal movement of the prosthetic disc. Computed tomography images of the patient's heart demonstrated suspicion for vegetative thrombus and periannular abscess formations. Further valve fluoroscopy confirmed a stuck tilting disc (Figure 1, *A*) and positron-emission tomography cardiac imaging identified 2 separate annular abscesses but ruled out distal hemiarch graft involvement (Figure 1, *B*). The patient provided informed written consent for the publication of the study data; institutional review board approval was not required (Video 1).

Given the diagnostic findings and the patient's young age, urgent surgery was arranged and the Ross procedure was selected as the preferred reconstructive strategy to reduce recurrent infection risks and for optimal long-term event-free survival. Intraoperative TEE found abscesses around both coronary ostia (Figure 1, *C* and *D*). At operation, the adhesions were extremely dense, necessitating a meticulous 4-hour dissection. After initiating cardiopulmonary bypass and diastolic arrest through ostial del Nido cardioplegia, the previous Bentall graft was excised, exposing extensive vegetations on both mechanical disc (Figure 2, *A*) and notable abscesses with frank pus beneath both coronary buttons (Figure 2, *B* and *C*). The prosthetic root was carved out of the frozen periaortic root space (Figure 2, *D*), and the entire periabscess space, including around the conduction tissue and left ventricular outflow tract (LVOT) was debrided extensively. Subsequently, the pulmonary autograft was harvested as usual, which was measured around 21 mm, which matched

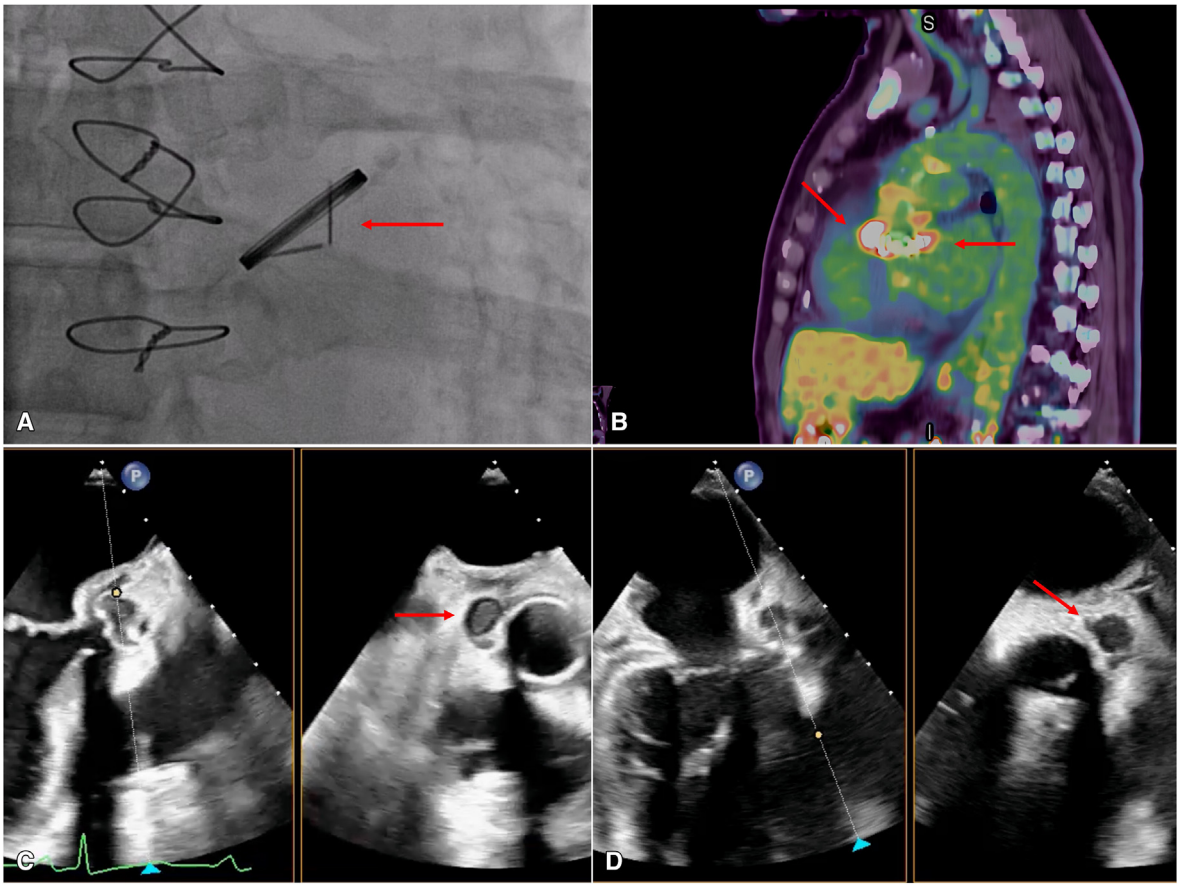
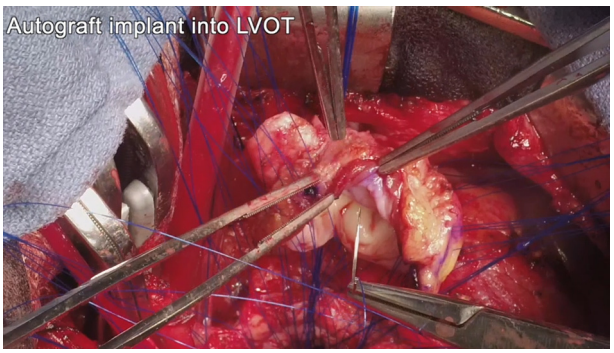


FIGURE 1. Preoperative evaluations. A, Valve fluoroscopy showed 1 stuck tilting disc (*red arrow*). B, Positron-emission tomography cardiac imaging identified 2 separate annular abcesses (*red arrows*) but ruled out distal hemiarch graft involvement. C and D, Intraoperative transesophageal echocardiography; images showing abscess formations around right coronary artery (C) (*red arrow*) and left main coronary artery (D) (*red arrow*).

the small 21-mm aortic annulus. Neoaortic commissures were developed and the pulmonary autograft was implanted deep with the LVOT with interrupted sutures to exclude the abscess cavities and prevent late autograft dilatation. Deep suture placement in the LVOT aimed to avoid recurrent infection and dehiscence. A 27-mm Artivion Synergraft pulmonary homograft was anastomosed distally to the pulmonary bifurcation and proximally to the right ventricular outflow tract. The autograft was finally anastomosed to the previous hemiarch graft, and the crossclamp was removed. Postoperative TEE confirmed preserved biventricular function, the excellent function of the pulmonary autograft and pulmonary homograft, demonstrating mean/peak gradients within normal ranges (4/12 mm Hg and 3/9 mm Hg, respectively) and no valvular insufficiency. The cardiopulmonary bypass and aortic crossclamp times were 381 and 275 minutes, respectively. The patient was transfer back to intensive care unit without inotropic support and extubated on postoperative day (POD) 1.



VIDEO 1. Prosthetic root endocarditis treated with radical debridement and pulmonary autograft reconstruction. Video available at: https://www.jtcvs.org/article/S2666-2507(24)00152-4/fulltext.

A leadless single-chamber ventricular pacemaker was implanted on POD 2 due to complete atrioventricular block. Intraoperative tissue culture results, consistent with initial blood culture findings of *Streptococcus salivarius*, led to a 6-week course of intravenous vancomycin. The patient was discharged uneventfully on POD 9. She remained well at 3 months' follow-up, with TEE showing normal ventricular function, aortic valve mean/peak gradients at 4/8 mm Hg with trace insufficiency and pulmonary mean/peak gradients at 4/9 mm Hg with trace regurgitation.

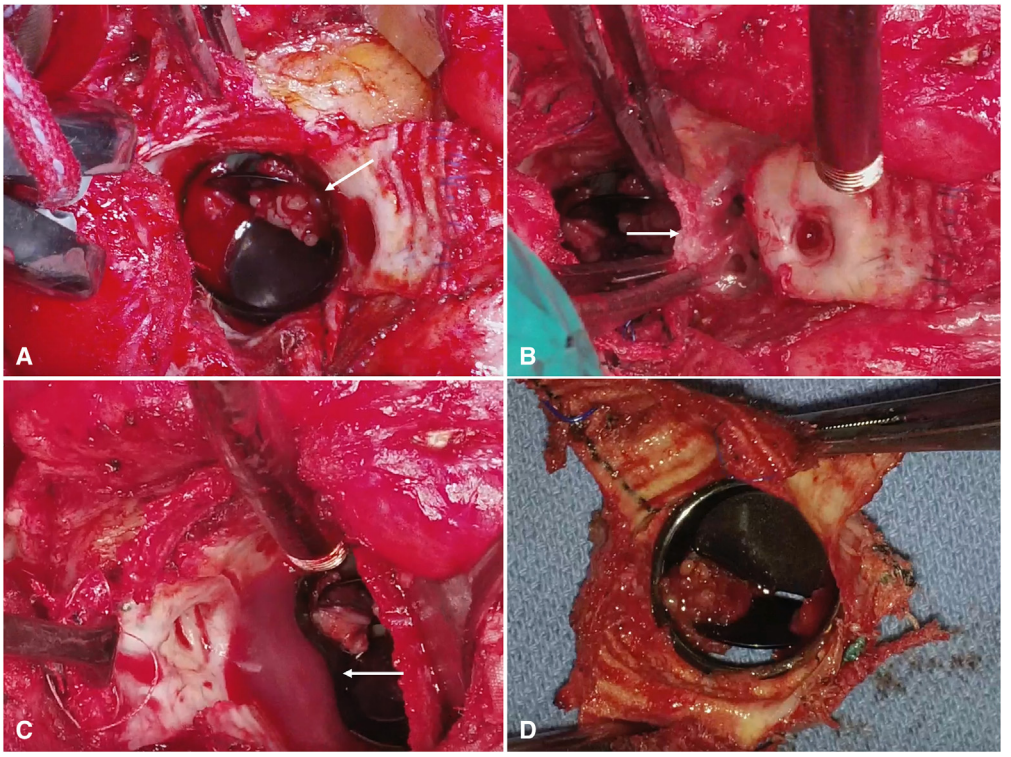


FIGURE 2. Intraoperative images. A, Extensive vegetations on both mechanical leaflets (*white arrow*). B, Frank pus and abscess cavity beneath right coronary ostium (*white arrow*). C, Abscess with significant frank pus beneath left coronary ostium (*white arrow*). D, Explanted previous prosthetic root.

Although prosthetic aortic root infections can be quite extensive, we believe that with aggressive debridement and complete reconstruction good outcomes can be achieved, including using the pulmonary autograft to optimize and enhance survival and patient quality of life.[3] In addition, comparing with aortic homografts, a living pulmonary autograft in the aortic position can significantly improve long-term clinical outcomes.[4,5] The present case report highlights the challenges of managing prosthetic root endocarditis and the successful use of the Ross procedure in managing complex prosthetic infections, particularly in a relatively young and active patient population.

Webcast

You can watch a Webcast of this AATS meeting presentation by going to: https://www.aats.org/resources/prosthetic-root-endocarditis-t-8326.

Conflict of Interest Statement

Dr Chu has received speaker's honoraria from Medtronic, Edwards, Terumo Aortic, and Artivion. All other authors reported no conflicts of interest.

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

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