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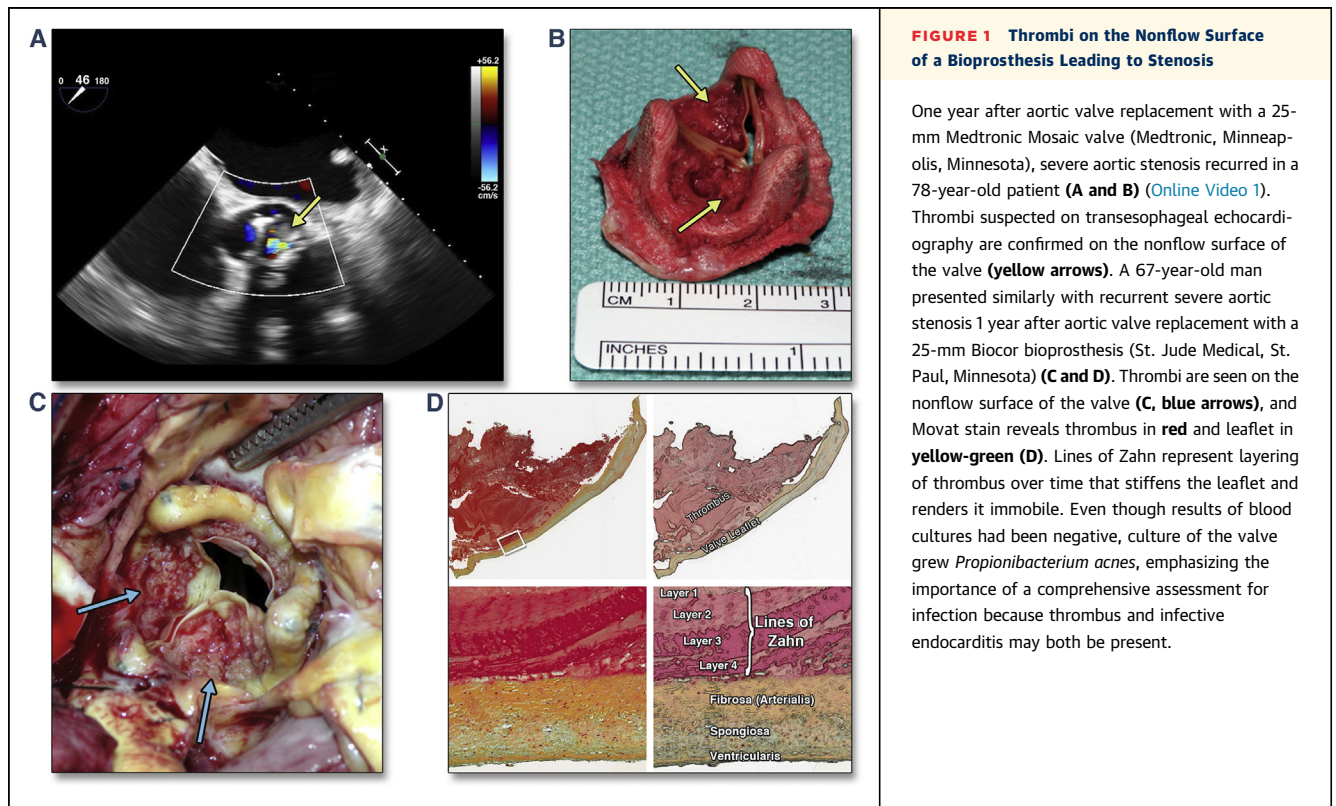
Early Bioprosthetic Valve Failure

A Pictorial Review of Rare Causes



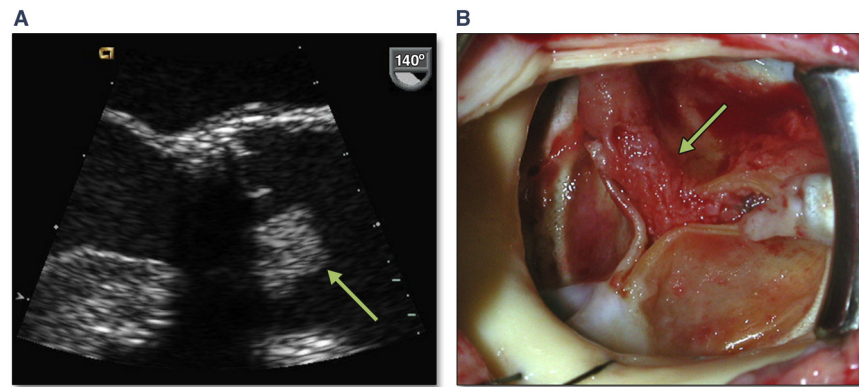
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IN OLDER ADULTS, BIOPROSTHETIC VALVES RARELY FAIL WITHIN 5 YEARS OF THE INDEX SURGERY. Such failures pose a challenge to patients, clinicians, and surgeons. Although clinicians are generally aware of valve dysfunction related to overt endocarditis, patient-prosthesis mismatch, and technical error, less-recognized causes of early bioprosthetic valve failure include valve thrombosis (Figures 1 and 2, Online Videos 1 and 2), excessive pannus formation (Figures 3 and 4, Online Videos 3, 4, 5, and 6), and accelerated structural valve deterioration (Figures 5 and 6, Online Videos 7, 8, 9, and 10). Given their rarity, these failure mechanisms have

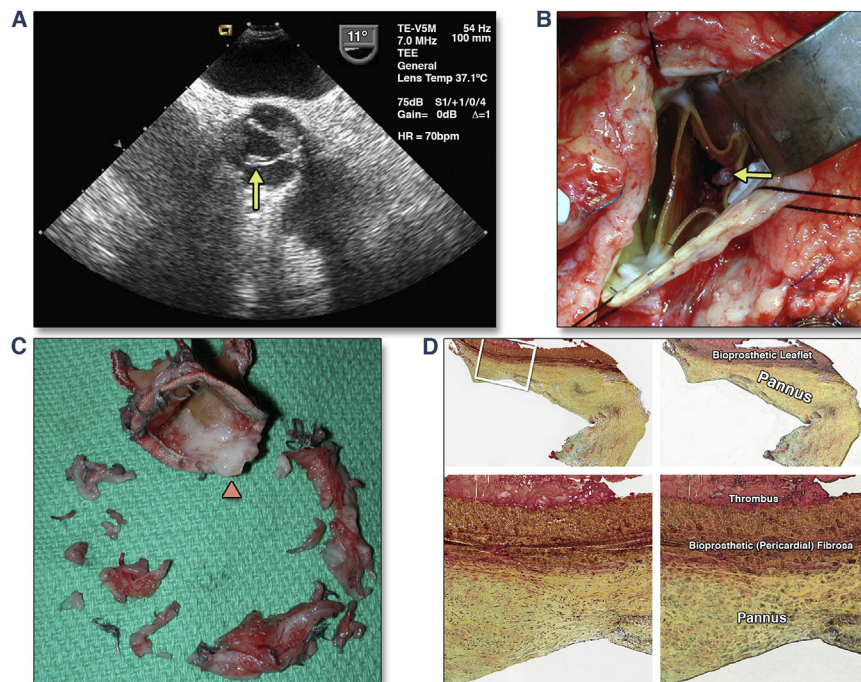


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FIGURE 2 A Large Thrombus Causing Bioprosthetic Valve Stenosis

Three years after receiving a 21-mm Carpentier-Edwards valve (Edwards Lifesciences, Irvine, California), a 51-year-old woman returned with severe aortic stenosis and a large thrombus (**green arrows, A and B**) ([Online Video 2](#)). The microbiologic assessment was unremarkable, and she received a 24-mm homograft. With aortic valve thrombosis, the threshold for root replacement may be lower because aortic homografts may have decreased thrombogenicity.

FIGURE 3 Thrombus and Subvalvular Pannus Resulting in Bioprosthetic Valve Stenosis

One year after aortic valve replacement with a 21-mm, 3-F stentless valve (Medtronic), a 58-year-old woman returned with severe aortic stenosis. A focal thrombus (**yellow arrow, A and B**) ([Online Video 3](#)) was observed, as well as extensive subvalvular pannus (**pink arrowhead, C**). Movat stain of the valve (**D**) revealed the fibrosa layer of the bovine pericardium as **dark yellow-orange**, rich in fibrous tissue. Small thrombi may serve as a nidus for exuberant pannus formation. Both the thrombus and subvalvular pannus contribute to immobilization of the leaflet and valvular stenosis.

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