

Stuck Bioprosthetic Aortic Valve—A New Entity? A Case Report

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ABSTRACT

We describe herein a case of bioprosthetic valve malfunction, which closely imitates a stuck valve. Although the term “stuck” was used originally for the immovable mechanical valve leaflets, the echocardiographic manifestation of this malfunction is similar to those of a mechanical one. The clinical presentation of the stuck bioprosthesis is, however, far more benign than a stuck mechanical valve. Familiarity with this entity is important.

INTRODUCTION

The term “stuck valve” has been defined as a dysfunctional mechanical prosthesis in which at least 1 leaflet loses its free movement and is “stuck” in either an open or closed position. The term was originally used to describe a mechanical valve complication in which a mass, such as a thrombus, lodges in the valve, constricting the movement of 1 or both of the valves leaflets. We have found that this complication is mimicked in bioprosthetic valves. This is the first reported case of a stuck bioprosthetic valve.

CASE

A 65-year-old man was admitted to the emergency room with a history of exacerbating fever for the prior few days. On his previous admission to the emergency room, 8 days earlier, an antibacterial treatment with oral roxithromycin was initiated for a diagnosis of an upper respiratory tract infection, as the patient complained of some pharyngeal discomfort. Despite this antibiotic therapy, an ongoing low-grade fever of 37.6°C was noted.

Two months earlier the patient had undergone an aortic valve replacement with a bioprosthetic Perimount 27 mm valve (Edwards Lifesciences, Irvine, CA, USA). The indication for the valve replacement was severe aortic stenosis of a

calcified bicuspid valve. The revision of the pathologic specimen revealed calcified fibrotic leaflets with acute and chronic inflammation, but no bacteria were detected on gram stain. The surgical course of valve replacement was uneventful. The postoperative course was remarkable with an episode of atrial fibrillation on the second postoperative day, which was treated with amiodarone and resolved after 1 day. In addition, a fever of 37.7°C with no increase of the white blood cell count, 6100/μL was noted in the third postoperative day. The patient was treated with a nonsteroidal anti-inflammatory agent, naproxene for a diagnosis of postpericardiotomy syndrome. Upon discharge the patient was feeling good, in sinus rhythm with no fever.

The patient's past medical history was unremarkable except for benign prostatic hypertrophy, which was treated with dibenzylamine. Persistence of fever despite antibiotic treatment in such a patient with recent valve replacement necessitated a workup for fever. The antibiotic treatment was discontinued, and blood, urine, and sputum were sampled for culture. The fundoscopic examination was normal, and no other evidence of embolic or immunological signs of infective endocarditis were detected. Results of the serologic examination for atypical bacteria were negative. The workup also included a transthoracic echocardiogram, which revealed no evidence of vegetation or other mass on the aortic or other valves, trace aortic valve regurgitation, and a peak systolic pressure gradient of 15 mm Hg and a mean of 9 mm Hg.

In the meantime, the patient was asymptomatic and afebrile with normal white blood cell count. Because endocarditis was included in the differential diagnosis of the unexplained fever in this patient after valve replacement, a transesophageal echocardiographic (TEE) study was performed. The TEE study demonstrated the 3 leaflets of the bioprosthetic valve in normal closed position, with normal opening movement of only the left and the right coronary cusps. The noncoronary cusp was completely immobile with a 7 × 12 mm mass impinging on its aortic surface, along its free edge. This finding was clearly visualized in both the closed (Figure 1) and open (Figure 2) positions.

At this stage a differential diagnosis included mainly a vegetation versus a thrombus. We elected to treat the patient by addressing both possible diagnoses with intravenous anticoagulation and antibiotics. Except for the improvement of the minimal malaise he had prior to the TEE, the patient remained asymptomatic during the treatment. All cultures remained sterile during the hospital stay.

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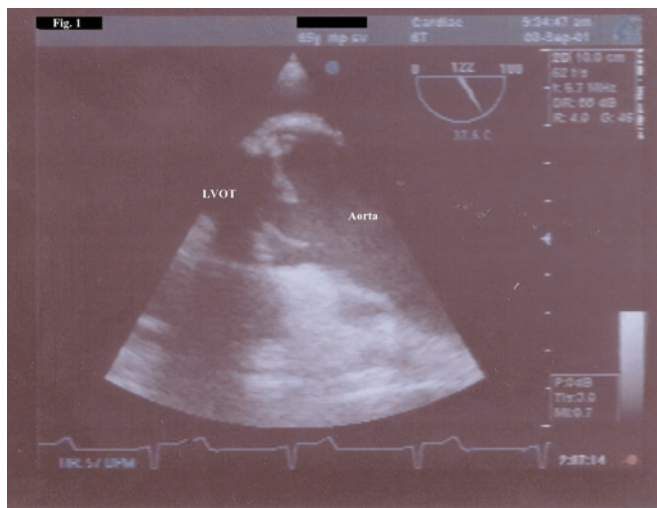


Figure 1. Long axis view of the aortic valve where the noncoronary cusp is in the "immobile" position.

A planned follow-up TEE was performed 9 days later to evaluate possible changes of the aortic valve mass; the follow-up TEE revealed a normal functioning bioprosthetic valve with full normal movement of all cusps, including the complete disappearance of the limitation of opening of the previously fixed noncoronary cusp. The patient was discharged in good condition with a recommendation to continue oral anticoagulants for 3 months and intravenous antibiotics for 4 weeks.

DISCUSSION

The stuck prosthetic valve is a well-defined type of dysfunctional mechanical valve. A dysfunctional bioprosthetic valve is one compromised by calcification, tear, and/or perforation of the leaflets [Baue 1996]. The soft and flexible leaflets of a bioprosthetic valve, in contrast to the mechanical valves with leaflets, are less susceptible to blockage or to being trapped in a fixed position by a mass. Furthermore, its radioluscent leaflets make the echocardiogram a much more sensitive diagnostic tool, and thereby provide accurate modality compared to fluoroscopy for evaluation of bioprosthetic valve dysfunction. Restricted leaflet movement could be the result of a mass of different etiologies within the valvular apparatus, which would disrupt the valve's normal opening and closing. Such pathologies most often include thrombus, vegetation, or, in rare cases, a foreign material. Complications are often due to improper anticoagulation.

In general, a biological valve, and not a mechanical one, is implanted for specific indications [Braunwald 1997], the most common being contraindication to anticoagulation. The ACA/AHA guidelines for anticoagulation therapy for

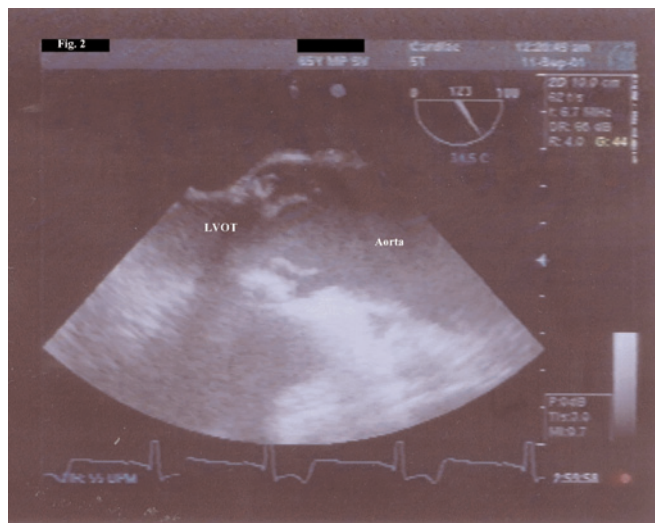


Figure 2. Long axis view of the aortic valve where the valve is fully opened.

post-aortic valve replacement with a bioprosthetic valve indicate that, because of an increased risk of thromboemboli in the first 3 months after implantation of a biological prosthetic valve, anticoagulation with warfarin is usually recommended, although in several centers, only aspirin is used for biological valves in the aortic position. Risk is particularly high in the first few days after surgery [Bonow 1998]. In this specific case, our patient did not receive anticoagulation.

In conclusion, we are reporting the first case of a stuck bioprosthetic valve. It is commonly accepted that dysfunctional states of bioprosthetic valves are limited to insufficiency, obstruction, or disruption. It is important, however, to emphasize that the possibility of a partially stuck bioprosthetic valve, although rare, needs to be considered. The diagnosis of such a condition should be based on a high degree of clinical suspicion, using echocardiography and not fluoroscopy. Better understanding of the natural history of this previously unrecognized entity, probably more benign than that of a stuck mechanical valve, warrants further investigation.

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