Case Report: Aortic Valve Replacement After JARVIK 2000 Left Ventricular Assist Device Implantation in Long-Time Survivor With Severe Aortic Valve Regurgitation

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ABSTRACT

Background. There are limited clinical records in the literature regarding aortic valve replacement in left ventricular assist device (L-VAD) patients. Previously we had two cases of severe aortic valve regurgitation in patients with L-VAD support treated with Corvalve prosthesis insertion and Amplatzer closure procedure. Both patients died a few days after the procedure from complications not related to the procedure itself.

Patient History. The patient was a male with previous coronary artery bypass graft surgery in 2001 that was complicated with postischemic dilated cardiomyopathy with severe heart failure (ejection fraction [EF], 20%). Cardiac resynchronization therapy was biventricular-pacemaker and cardiac defibrillator implantation in 2009 for recurrent ventricular arrhythmia. L-VAD implantation (Jarvik 2000) with graft apposition in descending thoracic aorta through left thoracotomy access and retro-auricolar cable was performed in October 2013. In 2015 the patient underwent surgical aortic valve replacement with bioprothesis due to progressive worsening of the aortic valve regurgitation. The Jarvik 2000 outflow was occluded with vascular ball occluder inserted via right axillary artery under fluoroscopy before CEC installation. The recovery was without major complications.

Discussion. Long-time survivors with Jarvik 2000 are increasing in number and such late complication is expected to become a main future issue. Our previous experience with the interventional approach was delusive. Due to the fatal consequences in similar patients with nonsurgical approaches, we opted for surgical aortic valve replacement. At the moment, the international literature does not describe safe approaches regarding aortic valve replacement in patients with Jarvik 2000 L-VAD. This case shows that surgical valve replacement could be managed with success according to the described specific technique.

LEFT ventricular assist device (L-VAD) implantation has become a mainstay therapy for end-stage heart failure patients who are either ineligible for or awaiting cardiac transplantation. However, aortic valve regurgitation (AR) is an important complication of these devices and yet no surgical protocol had been established for facing this crucial problem [1]. In an attempt to reduce the operative risks, two previous cases of severe AR in patients with L-VAD Jarvik 2000 support had been treated with Corvalve

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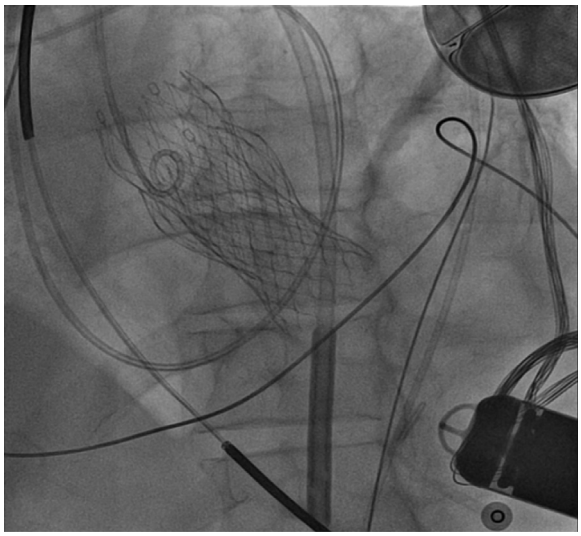

Fig 1. Corvalve prothesis implantation.

prosthesis implantation [2] (Fig 1) and Amplatzer aortic valve occlusion procedure [3] (Fig 2), respectively. Both patients died a few days later after the procedures, due to hemodynamic instability and intestinal ischemia, respectively. The goal of this case report was to elucidate an innovative and specific designed surgical technique for the important issue of aortic valve replacement after L-VAD Jarvik 2000 implantation [4,5].

CASE REPORT

The patient was a 67-year-old man with arterial hypertension, monoclonal gammopathy of undetermined significance, chronic atrial fibrillation, and pulmonary hypertension. Previous three-vessel coronary artery bypass grafting surgery was performed in 2001 after myocardial infarction complicated with postischemic dilated cardiomyopathy with severe heart failure (ejection fraction [EF], 20%). Cardiac resynchronization therapy was biventricular-pacemaker and cardiac defibrillator implantation in 2009 for recurrent ventricular arrhythmia. Due to the old age and other comorbilities we opted for L-VAD destination therapy with Jarvik 2000 and outflow graft in descending aorta through left posterior thoracotomy access and retro-auricolar pedestal plug in 2013. Due to the progressive worsening of AR on September 9, 2015 (Fig 3), the patient underwent surgical aortic valve replacement with bioprothesis (Sorin Mitroflow 21). The surgical intervention was aided by an interventional radiology approach to gain Jarvik 2000 occlusion throughout the entire surgical period. This was achieved via a right axillary artery surgical exposure and retrograde catheterization with a standard Seldinger technique. A 0.035″ angled

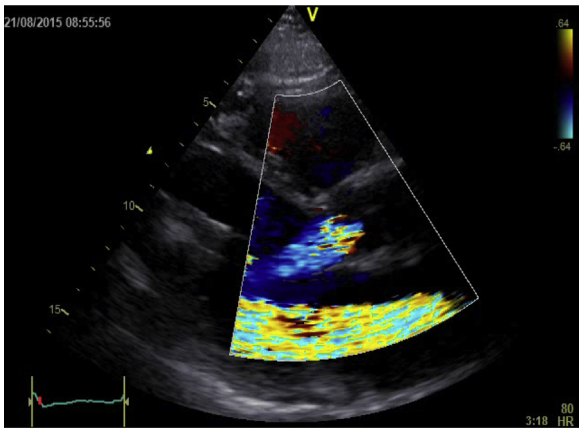

Fig 3. Preoperative echocardiography.

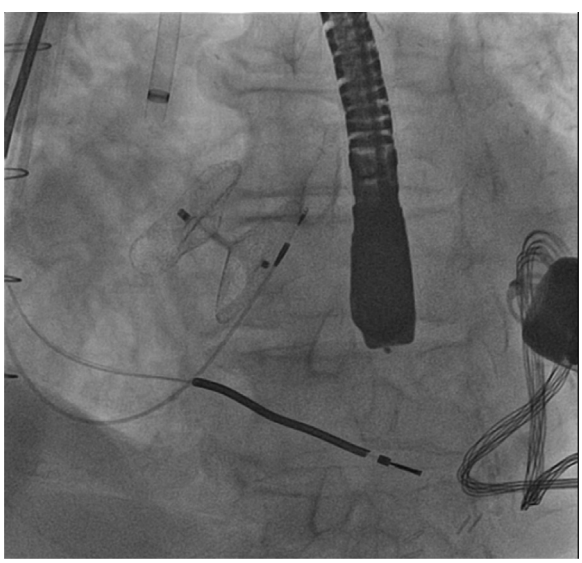

Fig 2. Amplatzer aortic valve occlusion.

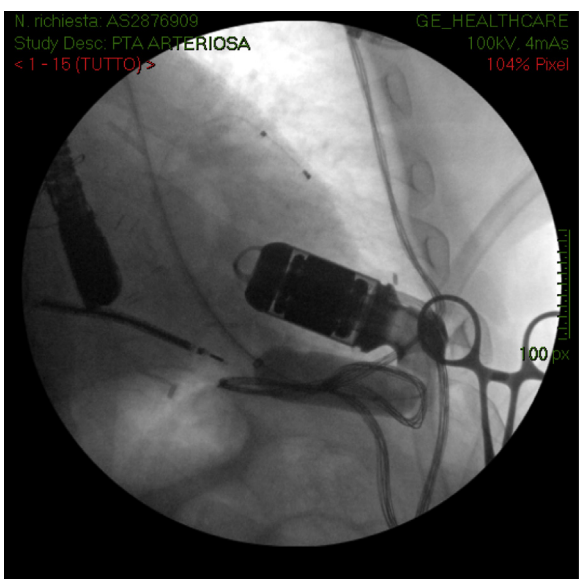

Fig 4. Vascular ball occluding the outflow graft.