



CASE REPORT

Combined venoarterial extracorporeal membrane oxygenation and transcatheter aortic valve implantation for the treatment of acute aortic prosthesis dysfunction in a high-risk patient



Amedeo Pergolini^a, Giordano Zampi^{b,*}, Maria Denitza Tinti^a, Vincenzo Polizzi^a, Paolo Giuseppe Pino^a, Daniele Pontillo^c, Francesco Musumeci^a, Giampaolo Luzi^a

^a Department of Cardiovascular Science, "S. Camillo-Forlanini" Hospital, Rome, Italy

^b Department of Cardiology, Belcolle Hospital, Viterbo, Italy

^c Department of Cardiomyopathies and Heart Failure, Belcolle Hospital, Montefiascone Facility, Montefiascone (VT), Italy

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KEYWORDS

Extracorporeal membrane oxygenation;
Transcatheter aortic valve implantation;
Prosthesis dysfunction;
Cardiogenic shock

Abstract We describe the case of a patient with acute bioprosthesis dysfunction in cardiogenic shock, in whom hemodynamic support was provided by venoarterial extracorporeal membrane oxygenation, and successfully treated by transcatheter aortic valve implantation.
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PALAVRAS-CHAVE

Oxigenação da membrana extracorporeal;
Implantação percutânea da válvula aórtica;
Disfunção protética;
Choque cardiogénico

Uso combinado de oxigenação da membrana extracorporeal e implantação percutânea da válvula aórtica para o tratamento de disfunção protética aórtica aguda num doente de alto risco

Resumo Apresentamos o caso de um doente com disfunção aguda de bioprótese em choque cardiogénico com suporte hemodinâmico através de oxigenação da membrana extracorporeal (vaECMO) e tratado com sucesso através de implantação percutânea da válvula aórtica (TAVI).
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* Corresponding author.

E-mail address: giordano.zampi@alice.it (G. Zampi).

Introduction

Transcatheter aortic valve implantation (TAVI) is used to treat high-risk patients with bioprosthetic valve degeneration (valve-in-valve technique). We describe the case of a patient with acute bioprosthesis dysfunction in cardiogenic shock, in whom hemodynamic support was provided by venoarterial extracorporeal membrane oxygenation (ECMO), and successfully treated by TAVI.

Case report

A 62-year-old Caucasian male underwent conventional aortic valve replacement using a stented bioprosthesis (standard 23 mm Carpentier-Edwards Perimount) six years ago, as suggested by the cardiac surgeons, in order to avoid oral anticoagulation. Transthoracic echocardiography performed six months before admission showed normal left ventricular ejection fraction with a normally functioning aortic bioprosthesis and slightly elevated gradients (mean pressure gradient 18 mmHg). The patient was referred to the emergency department of our hospital in cardiogenic shock complicated by pulmonary edema (Figure 1) and was immediately treated with diuretics and high-dose inotropes to achieve stabilization.

Eventually transesophageal echocardiography was performed, showing severe eccentric aortic regurgitation (Figures 2 and 3, Video 1) due to prosthesis degeneration and cusp tears (Figure 4, Video 2) together with depressed left ventricular ejection fraction (about 20%).

The presence of active endocarditis was ruled out by a completely normal blood count, a procalcitonin value within normal limits and negative blood cultures.

In view of the Society of Thoracic Surgeons (STS) predicted 30-day mortality score of 13% and a EuroSCORE II of 28%, our heart team decided on urgent TAVI, with a valve-in-valve procedure through a transapical approach.

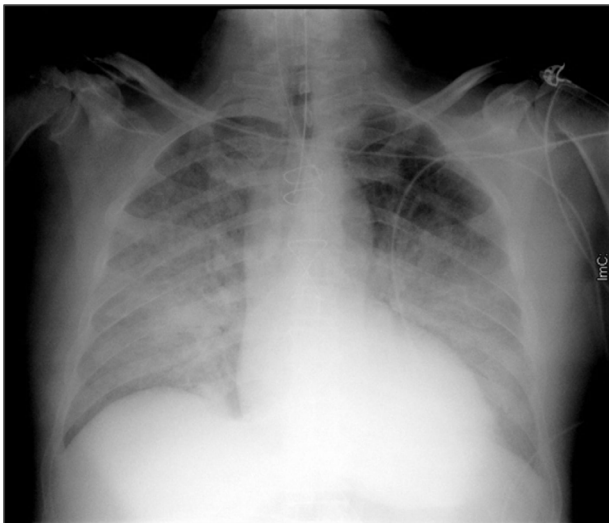


Figure 1 Chest X-ray showing cephalization of pulmonary veins and indistinctness of the vascular margins. The heart is enlarged.

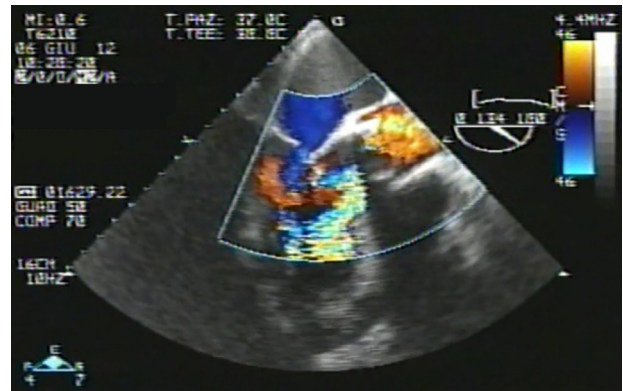


Figure 2 Transesophageal echocardiography, long-axis mid-esophageal view, showing severe eccentric aortic regurgitation.



Figure 3 Transesophageal echocardiography, transgastric view.

Due to life-threatening cardiogenic shock, miniaturized venoarterial ECMO was used as a bridging therapy to stabilize the patient, and on the following day he underwent TAVI with a 26 mm SAPIEN aortic bioprosthesis through a left anterior minithoracotomy by a transapical approach (Figure 5).

There were no periprocedural complications and following progressive hemodynamic improvement, the ECMO was removed on day two after TAVI.

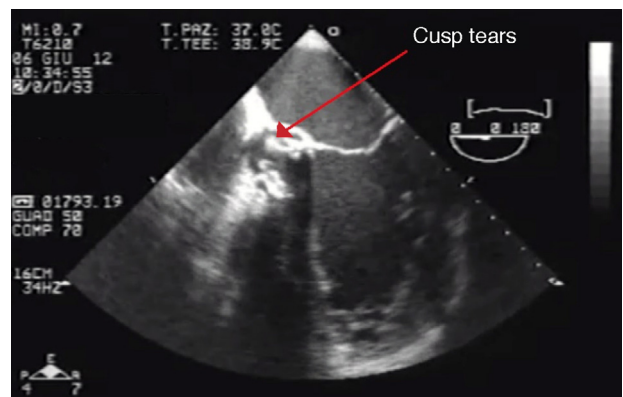


Figure 4 Transesophageal echocardiography, 4-chamber mid-esophageal view, showing prosthesis degeneration and cusp tears (red arrow).

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