The vascular prosthesis used for extracorporeal membrane oxygenation cannulation mimicking pseudoanerysm

Anna Drohomirecka[1*], Małgorzata Sobieszczańska-Małek[1*], Jarosław Kuriata[2], Piotr Kołsut[2], Mariusz Kruk[3], Paweł Kwiatek[4], Mariusz Kuśmierczyk[2], Tomasz Zieliński[1], Ilona Michałowska[4]

1 Department of Heart Failure and Transplantology, National Institute of Cardiology, Warsaw, Poland
2 Department of Cardiac Surgery and Transplantology, National Institute of Cardiology, Warsaw, Poland
3 Department of Coronary and Structural Heart Diseases, National Institute of Cardiology, Warsaw, Poland
4 Department of Radiology, National Institute of Cardiology, Warsaw, Poland

Venoarterial extracorporeal membrane oxygenation (ECMO) has gained on importance as the first-line mechanical circulatory support in patients with hemodynamic compromise of different etiology. The number of cardiac ECMO runs has increased rapidly over the last decade and postcardiotomy shock (in a broad spectrum of cardiac operations) is still one of the main indications for ECMO.[1]

We present the case of a patient who required temporal mechanical circulatory support after cardiac transplantation.

A 44-year-old woman underwent cardiac transplantation due to advanced heart failure in the course of dilated cardiomyopathy. After reperfusion, primary graft dysfunction was observed. Weaning from cardiopulmonary bypass was possible thanks to implantation of central venoarterial ECMO. The arterial line was connected to the ascending aorta with a 30-cm-long Dacron graft, 10 mm in diameter. Venous access was achieved through the femoral vein. During mechanical circulatory support, systolic function of the transplanted heart was recovered. ECMO was removed 4 days after the transplantation. To avoid another sternotomy, a proximal part of the prosthesis grafted to the aorta was left and the distal end was

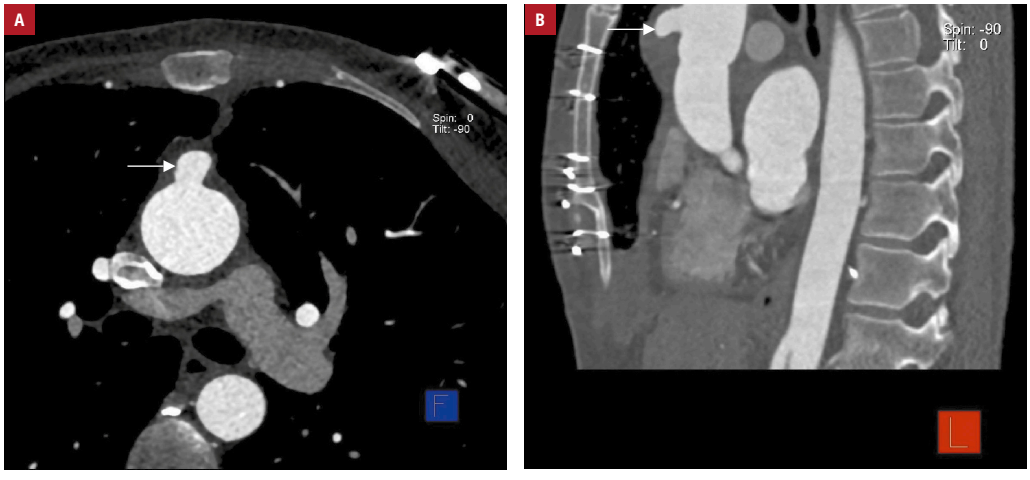

FIGURE 1 Coronary computed tomography angiography showing extravasation of contrast medium at the level of the ascending aorta (arrows) in a cross-sectional view (**A**) and sagittal view (**B**)

Correspondence to:
Małgorzata Sobieszczańska-Małek, MD, PhD, Department of Heart Failure and Transplantology, National Institute of Cardiology, ul. Alpejska 42, 04-628 Warszawa, Poland, phone: +48 22 343 44 83, email: m.sobieszczanska@ikard.pl
Received: March 10, 2020.
Revision accepted: April 22, 2020.
Published online: April 28, 2020.
Kardiol Pol. 2020; 78 (6): 605-606
doi:10.33963/KP.15319

* AD and MS-M contributed equally to this work.

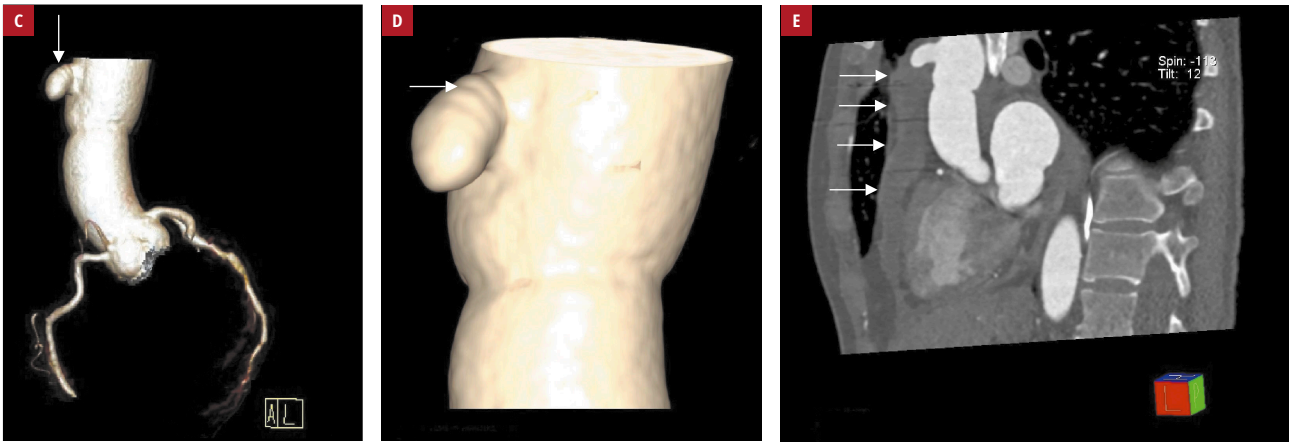

FIGURE 1 Three-dimensional reconstruction showing ribbing of the Dacron graft: **C** – view of the ascending aorta with the coronary arteries and **D** – a detailed view; **E** – thrombosed graft remnant (arrows)

surgically closed outside the chest and afterwards placed inside the chest through the cannulation hole. Further postoperative course was uneventful.

Two months later, coronary computed tomography angiography revealed extravasation of contrast at the level of the ascending aorta which in the first place suggested pseudoaneurysm (FIGURE 1A and 1B). A three-dimensional reconstruction showed characteristic ribbing of the graft (FIGURE 1C and 1D) and a modified sagittal view showed the thrombosed graft remnant (FIGURE 1E). Based on the surgical history of the patient, we determined that the observed abnormality is in fact a nonthrombosed part of the Dacron graft. The patient was consulted with cardiac surgeon who did not indicate any medical intervention due to the computed tomography findings.

Primary graft dysfunction occurs in 2.3% to 28.2% of heart transplant recipients.[2] In primary graft dysfunction, an implantation of veno-arterial ECMO, which could provide left, right, or biventricular support, is a bridge to recovery, decision, or retransplantation.

Using vessel prostheses in central ECMO (as described above) allows the chest to be closed and the cannula to be removed without resternotomy. However, as this technique is relatively new and requires the involvement of a cardiac surgeon, in less experienced centers, the image of prosthesis remnant may be erroneously taken for aorta pathology which potentially raises the risk of unnecessary clinical intervention (eg, further diagnostic examinations, emergency consultations, referring patient to a cardiothoracic center) when the patient does not need it. That is why thorough knowledge about various surgical techniques used in ECMO implantations as well as detailed information on the chosen modality in patient medical records are crucial to properly assess imaging examinations.

ARTICLE INFORMATION

ACKNOWLEDGMENTS The computed tomography scan was performed as part of a study supported by the National Institute of Cardiology (grant no. 2.3/V/18; to MS-M). The case was presented at the 14th Congress of the Polish Transplantation Society on October 17–18, 2019 in Zakopane, Poland.

CONFLICT OF INTEREST None declared.

HOW TO CITE Drohomirecka A, Sobieszczańska-Małek M, Kuriata J, et al. The vascular prosthesis used for extracorporeal membrane oxygenation cannulation mimicking pseudoanerysm. Kardiol Pol. 2020; 78: 605-606. doi:10.33963/KP.15319

REFERENCES

1 Guglin M, Zucker M, Bazan V, et al. Venoarterial ECMO for adults: JACC Scientific Expert Panel. J Am Coll Cardiol. 2019; 73: 698-716.

2 Kobashigawa J, Zuckermann A, Macdonald P, et al. Report from a consensus conference on primary graft dysfunction after cardiac transplantation. J Heart Lung Transplant. 2014; 33: 327-340.