IMAGES IN INTERVENTION

Percutaneous Transcatheter Closure of the Native Aortic Valve to Treat De Novo Aortic Insufficiency After Implantation of a Left Ventricular Assist Device

Benjamin H. Freed, MD,* Jonathan D. Paul, MD,* Nicole M. Bhave, MD,* Mark J. Russo, MD, MS,† Valluvan Jeevanandam, MD,† Roberto M. Lang, MD,* Atman P. Shah, MD*

Chicago, Illinois

A 54-year-old female with a HeartMate II (Thoratec, Pleasanton, California) left ventricular assist device (LVAD) presented 3 months after implantation with new-onset severe aortic insufficiency (AI) and cardiogenic shock. A reoperation for surgical aortic valve closure was too...
high risk, so the patient was referred for percutaneous therapy.

A 30-mm Amplatzer Multi-Fenestrated “Cribiform” Septal Occluder (AGA Medical, Plymouth, Minnesota) was delivered across the aortic valve via a percutaneously placed 9-F TorqVue catheter. With transesophageal echocardiography guidance, the device was positioned across the valve, resulting in no residual AI, mitral obstruction, or coronary occlusion (Online Video 1). The LVAD flow rates immediately decreased, and transthoracic echocardiography performed 1 week later demonstrated no AI (Fig. 1, Online Video 2).

One concerning complication of LVAD support is the development of hemodynamically significant AI, with one study reporting its presence in 51% of patients at 18 months (1). The development of late AI is associated with increased mortality and has been associated with functional closure of the aortic valve due to the newly implanted LVAD in the first month after implantation (1, 2). The mechanism of late AI is uncertain, but aortic root dilation and myxoid degeneration of the aortic valve are thought to be contributing factors (2).

Transcatheter treatment of AI in a neonate with hypoplastic left heart syndrome was accomplished with a 4-mm Amplatzer Septal Occluder (3). Grohmann et al. (4) reported treatment of LVAD-associated AI with transcatheter placement of an Amplatzer ventricular septal defect device via surgical cut-down of the left subclavian artery and placement of a 12-F sheath.

Widespread use of LVADs might result in an increasing incidence of LVAD-associated AI. Surgery requires an additional thoracotomy in patients who are already at high operative risk. This case describes a previously unreported percutaneous, transfemoral technique to successfully treat AI and improve LVAD function.

Reprint requests and correspondence: Dr. Atman P. Shah, University of Chicago Medical Center, 5841 South Maryland Avenue, MC 6080, Chicago, Illinois 60637. E-mail: ashah5@uchicago.edu.

REFERENCES

APPENDIX

For accompanying videos, please see the online version of this article.