

IMAGES IN INTERVENTION

Neurovascular Rescue for Thrombus-Related Embolic Stroke During Transcatheter Aortic Valve Implantation

Pablo Salinas, MD,* Raul Moreno, MD, PhD,* Remedios Frutos, MD,†
Jose Luis Lopez-Sendon, MD, PhD*

Madrid, Spain

An 88-year-old woman with critical aortic stenosis was scheduled for transfemoral transcatheter aortic valve implantation (TAVI). She received pre-procedural aspirin plus clopidogrel, and 100 IU/kg of unfractionated heparin during the procedure. The procedure was uneventful, and the balloon-expandable valve was successfully deployed. After

deflating the balloon, an echo-dense mobile mass was seen in the left ventricular outflow tract (Fig. 1, [Online Video 1](#)), probably attached to the intraventricular portion of the guidewire. This mass was not present after valvuloplasty, so torn leaflets from the native valve were unlikely. Activated clotting time was 270 s. When the

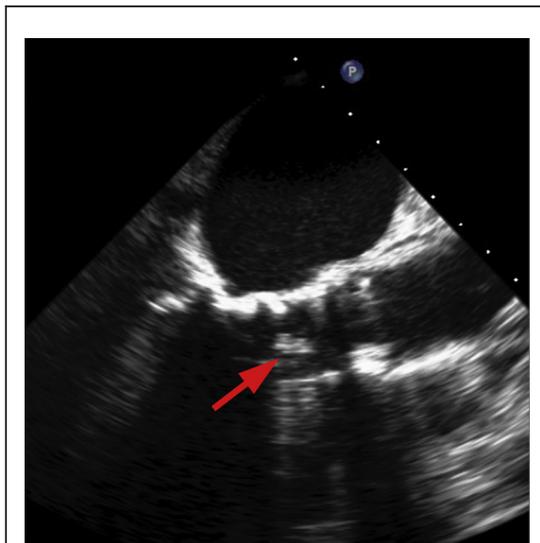


Figure 1. Transesophageal Echocardiogram After Prosthesis Deployment

Echo-dense mobile mass (**arrow**) in the left ventricular outflow tract after transcatheter valve deployment. This is best seen in [Online Video 1](#).



Figure 2. Initial Selective Cerebral Angiogram

Selective cerebral angiogram showing complete occlusion of the M1 branch (**arrow**) of the right middle cerebral artery and some thrombus in the A1 branch.

From the *Department of Cardiology, Interventional Cardiology, University Hospital La Paz, Madrid, Spain; and the †Department of Radiology, Neuroradiology, University Hospital La Paz, Madrid, Spain.

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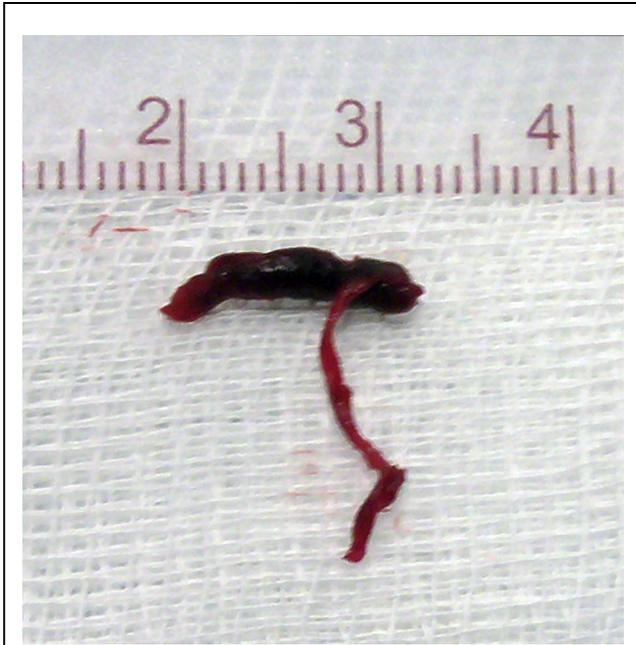


Figure 3. Retrieved Thrombus

Thrombus retrieved from the right middle cerebral artery.

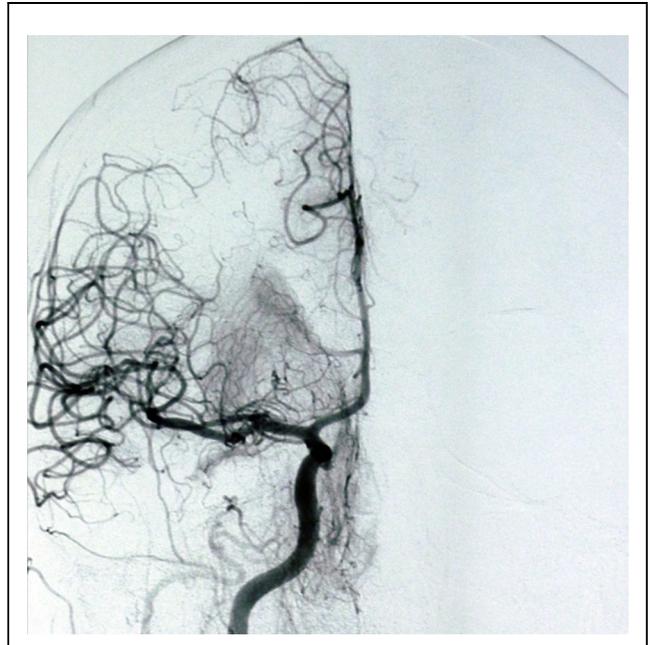


Figure 4. Control Cerebral Angiogram After Neurovascular Intervention

Control selective cerebral angiogram showing reperfusion of occluded arteries.

balloon catheter and guidewire were withdrawn, the mass disappeared.

The patient remained stable with nice prosthesis gradients. All pulses were palpable, but after prompt reversal of anesthesia, a complete left hemiparesis was found. A brain computed tomography scan confirmed a large right middle cerebral artery (RMCA) stroke. Immediate mechanical neurovascular rescue was attempted. In the initial angiography, there was a complete occlusion of the M1 branch of the RMCA with thrombus in the A1 branch (Fig. 2). Mechanical thrombectomy was performed with a Solitaire AB device (ev3, Endovascular Inc., Plymouth, Minnesota), extracting a 13-mm thrombus (Fig. 3). The control angiogram shows complete RMCA reperfusion (Fig. 4). The neurological deficit improved to modified Rankin scale 1 at discharge and remained unchanged after 6 months of follow-up.

Strokes during TAVI are attributed to calcific debris embolization, native valve guidewire crossing, and aortic balloon valvuloplasty (1). Catheter-related thrombus is a known cause of stroke during percutaneous coronary intervention with an incidence of approximately 0.4% (2). However, catheter-related thrombus during a TAVI procedure has not been previously reported and merits a few forethoughts. First, the optimal level of anticoagulation remains

uncertain. Second, it is important to promptly reverse anesthesia/sedation to assess any potential neurological deficit. Finally, interventional treatment for embolic strokes should be considered in selected cases.

Reprint requests and correspondence: Dr. Pablo Salinas, Interventional Cardiology, Department of Cardiology, University Hospital La Paz, Madrid, Castellana 267, 28046 Madrid, Spain. E-mail: salinas.pablo@gmail.com.

REFERENCES

1. Stortecky S, Windecker S, Pilgrim T, et al. Cerebrovascular accidents complicating transcatheter aortic valve implantation: frequency, timing and impact on outcomes. *EuroIntervention* 2012;8:62-70.
2. Hamon M, Baron JC, Viader F, Hamon M. Periprocedural stroke and cardiac catheterization. *Circulation* 2008;118:678-83.

Key Words: embolic stroke ■ interventional cardiology ■ interventional radiology ■ stroke ■ transcatheter aortic valve implantation.

APPENDIX

For the accompanying video, please see the online version of this paper.