JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 9, NO. 21, 2016

ISSN 1936-8798/$36.00
PUBLISHED BY ELSEVIER
http://dx.doi.org/10.1016/j.jcin.2016.08.027

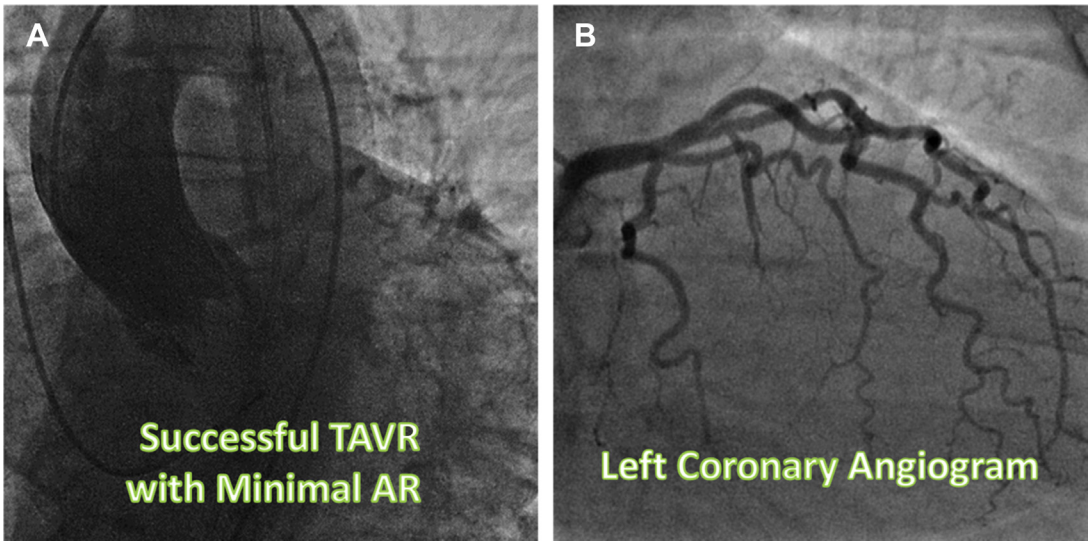
Fatal Thrombotic Occlusion of Left Main Trunk Due to Huge Thrombus on Prosthetic Aortic Valve After Transcatheter Aortic Valve Replacement

Michael Neuss, MD,[a,b] Hidehiro Kaneko, MD,[a,b] Grit Tambor, MD,[a,b] Frank Hoelschermann, MD,[a,b] Christian Butter, MD[a,b]

A 81-year-old woman was treated for severe aortic stenosis by transfemoral transcatheter aortic valve replacement (TAVR) using a 25-mm Portico valve (St. Jude Medical, St. Paul, Minnesota) (Figure 1A). Pre-procedural coronary angiography showed no significant stenosis (Figure 1B). Dual-antiplatelet therapy using aspirin and clopidogrel was terminated 6 months after TAVR, and the patient continued aspirin alone as antithrombotic therapy.

The patient remained asymptomatic for 2 years, but was then transferred to our emergency department with acute onset of chest pain, nausea, and shock. Electrocardiography showed ST-segment elevation in

FIGURE 1 Successful Transcatheter Aortic Valve Replacement

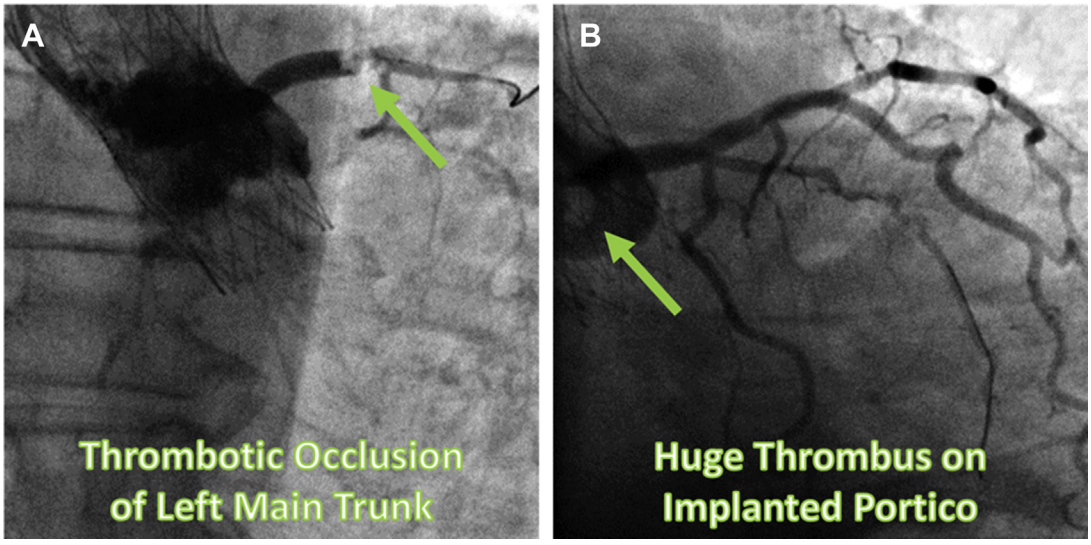


(A) Successful transcatheter aortic valve replacement with minimal aortic regurgitation. **(B)** Pre-procedural coronary angiography showed no significant stenosis in the left coronary artery.

From the [a]Department of Cardiology, Heart Center Brandenburg, Bernau, Germany; and the [b]Department of Cardiology, Medical School Brandenburg, Bernau, Germany. This work was supported by the Japan Society for the Promotion of Science (Dr. Kaneko). The authors have reported that they have no relationships relevant to the contents of this paper to disclose. Drs. Neuss and Kaneko contributed equally to this work.

Manuscript received August 1, 2016; accepted August 12, 2016.

FIGURE 2 Urgent Coronary Angiography



(A) Thrombotic occlusion of the left main trunk. **(B)** Huge thrombus formation on the Portico valve. **Green arrows** indicate thrombus (in the left main trunk: **A**, and on the implanted Portico: **B**).

multiple leads, and transthoracic echocardiography demonstrated globally depressed left ventricular ejection fraction and normal aortic valve function.

Urgent coronary angiography showed thrombotic occlusion of the left main trunk (Figure 2A) and a huge thrombus on the Portico valve (Figure 2B). During the coronary intervention, the patient developed pulseless electric activity, and we immediately initiated catecholamine and cardiopulmonary resuscitation. Despite the revascularization, including stent implantation and thrombolytic therapy, and continued cardiopulmonary resuscitation, the patient unfortunately died in the catheter laboratory.

Antithrombotic strategy remains an unresolved concern after TAVR. Recent American Heart Association and American College of Cardiology guidelines recommend dual-antiplatelet therapy for 6 months and thereafter aspirin indefinitely for patients without atrial fibrillation. Thrombus formation after TAVR is uncommon but may cause increasing transvalvular pressure gradient requiring anticoagulant therapy. It may be associated with thrombin-rich material. Therefore, antiplatelet therapy alone may be insufficient.

Furthermore, computed tomographic imaging after TAVR using Portico valves sometimes reveals hypoattenuated leaflet thickening and impaired valve leaflet mobility, which raise suspicion for thrombus formation. Thus, we need to pay attention to the possibility of thrombotic events after TAVR, particularly after Portico implantation.

Two multicenter randomized trials (GALILEO [Global Study Comparing a Rivaroxaban-Based Antithrombotic Strategy to an Antiplatelet-Based Strategy After Transcatheter Aortic Valve Replacement to Optimize Clinical Outcomes] and ATLANTIS [Anti-Thrombotic Strategy After Trans-Aortic Valve Implantation for Aortic Stenosis]) are now under way to compare the role of anticoagulation therapy following TAVR to antiplatelet-based strategies. The results of these trials may bring us further information to clarify this problem.

To our knowledge, this is the first experience of fatal complication by thrombotic occlusion of the left main trunk due to huge thrombus formation on a prosthetic aortic valve after TAVR. Considering this tragic case, it may be necessary to reconsider the regimen of antithrombotic therapy after TAVR.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Christian Butter, Department of Cardiology, Heart Center Brandenburg, Ladeburger Straße 17, Bernau D-16321, Germany. E-mail: c.butter@immanuel.de.

KEY WORDS left main trunk, portico, thrombus, transcatheter aortic valve replacement