JACC: CARDIOVASCULAR IMAGING
VOL. 10, NO. 1, 2017

ISSN 1936-878X/$36.00
PUBLISHED BY ELSEVIER

iMAIL

LETTERS TO THE EDITOR

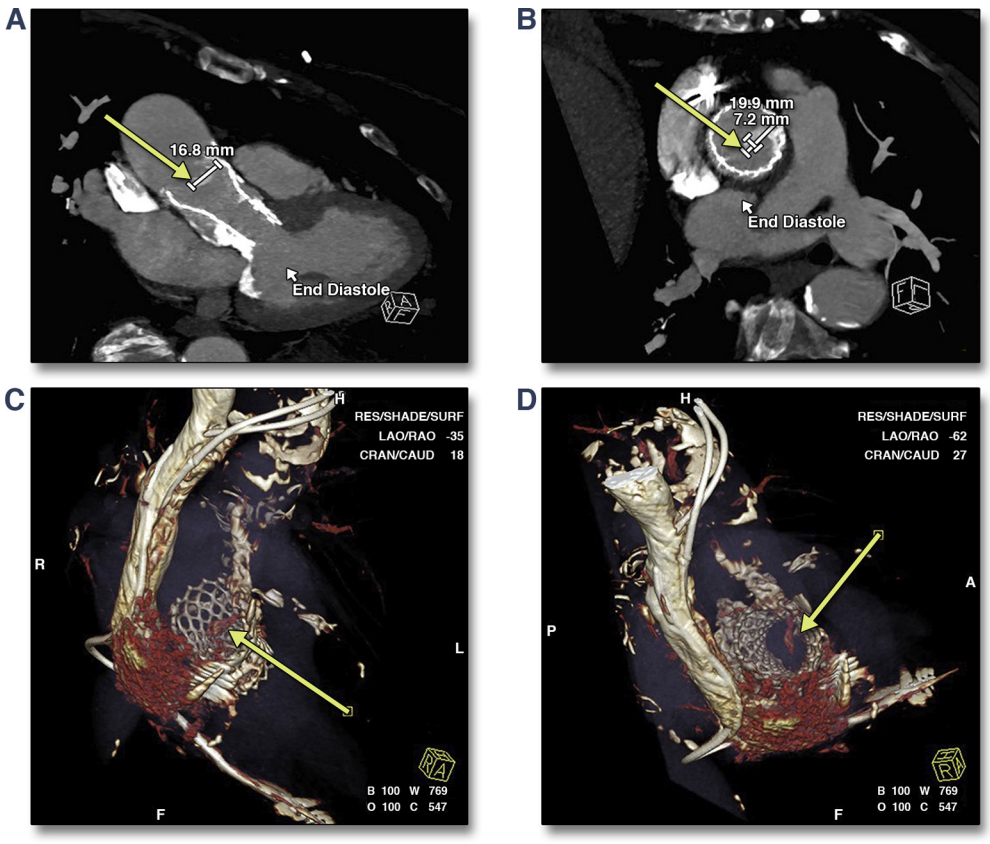
TAVR and Thrombosis

Transcatheter aortic valve replacement (TAVR) is a rapidly proliferating technology with the potential to become the dominant treatment strategy for aortic valve stenosis in patients who are at excessive or high operative risk (1). Antithrombotic therapy in the setting of TAVR has been empirically determined, with the most commonly recommended treatment consisting of unfractionated heparin during the procedure followed by dual antiplatelet therapy with aspirin (indefinitely) and clopidogrel (1 to 6 months) (2). Transcatheter heart valve (THV) thrombosis occurs in approximately 1% of patients after transcatheter aortic valve replacement, with a mean time to diagnosis of 9 ± 7 months (range 1 to 24 months) (3,4).

Several mechanisms that could potentially increase the risk of THV thrombosis have been proposed: 1) incomplete THV apposition to the aortic wall may delay endothelialization; 2) the metallic THV frame could potentially provide a site for thrombosis; 3) incomplete THV expansion can create leaflet folds and potential recesses for thrombus formation; and 4) the elderly TAVR population is more likely to have coexisting prothrombotic conditions (e.g., cancer) (4).

There is a case of asymptomatic thrombosis on the frame of the prosthetic valve. A 76-year-old female patient with symptomatic severe aortic stenosis

FIGURE 1 CT Images of the Thrombus on a CoreValve



(A and B) Computed tomography (CT) images in long and short axis showing the position of the CoreValve (Medtronic, Minneapolis, Minnesota) and the exact position of the thrombus **(yellow arrows)**. **(C and D)** 3-dimensional CT images showing the position and the relation of the thrombus with the surrounding structures **(yellow arrows)**.

was evaluated by the heart team in our hospital. The logistic EuroSCORE was 19.63%, driven mainly by kidney insufficiency and diffuse peripheral atheromatosis. The heart team selected the TAVR procedure, and a 26-mm CoreValve (Medtronic, Minneapolis, Minnesota) was implanted successfully in March 2015. The post-procedure echocardiographic evaluation demonstrated a 20-mm Hg mean gradient with a mild paravalvular leak. The patient received dual antiplatelet therapy (clopidogrel and aspirin) for 6 months, followed by clopidogrel 75 mg only.

A few days before her annual follow-up, she was hospitalized due to a recurrent gastrointestinal bleeding. A gastroscopy was performed, showing a leakage at the pylorus. At this point, clopidogrel was also stopped for 7 days. The patient remained asymptomatic.

In the parasternal long-axis view, a formation of a vibrating tissue on the struts, above the biological valve of the CoreValve, was seen without causing any stenotic phenomenon (mean gradient 20 mm Hg). The mild paravalvular leak was present without any worsening. Endocarditis was not diagnosed. A computed tomography scan was performed that showed the formation of a thrombus vibrating above the neovalve (**Figure 1**). Enoxaparin was administered on a dose of 80 UI/kg twice daily along with clopidogrel 75 mg. Six months after the first visualization of the thrombus, the same echocardiographic image was seen without any change or bleeding complications.

The type and duration of antithrombotic therapy after TAVR is still controversial. Pooled analysis of individual patient data from 672 participants comparing aspirin alone versus dual antiplatelet therapy after TAVR showed no difference in the rate of 30-day net adverse clinical and cerebral events, but a trend toward less life-threatening and major bleeding was observed in favor of aspirin alone (5). There are dedicated studies (ARTE [Aspirin versus Aspirin+Clopidogrel Following Transcatheter Aortic Valve Implantation], AUREA [The dual Antiplatelet Therapy versus oral Anticoagulation for a short time to prevent cerebral Embolism After TAVI], and POPULAR-TAVI [The Antiplatelet Therapy of Patients Undergoing Transcatheter Aortic Valve Implantation]) currently undergoing to resolve the issue of antiplatelets post-TAVR (5). Arguments supporting the potential benefits of oral anticoagulation therapy have also emerged, and 2 studies (GALILEO [Global multicenter, open-label, randomized, event-driven, active controlled study comparing a rivAroxaban-based antithrombotic strategy to an antipLatelet-based strategy after transcatheter aortic vaLve rEplacement Optimize clinical outcomes] and ATLANTIS [Anti-Thrombotic strategy to Lower All cardiovascular and Neurologic ischemic and hemorrhagic events after Trans-aortic valve Implantation for aortic Stenosis]) will try to answer. Establishing the optimal antithrombotic therapy for TAVR patients remains a challenge, largely due to the lack of properly powered studies to inform practice. Moreover, the presence of atrial fibrillation, mitral mechanical valve, and several comorbidities makes the choice of antithrombotic therapy more challenging.

TAVR is therapy evolving toward its maturation. The antithrombotic therapy after the procedure and its duration are to be settled by randomized trials. Currently, the type and the duration of the antithrombotic therapy have to be personalized toward the patient's need.

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http://dx.doi.org/10.1016/j.jcmg.2016.11.007

Please note: Dr. Toutouzas has served as a proctor for Evolute R. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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