CLINICAL IMAGE

Apical pseudoaneurysm after transapical transcatheter aortic valve implantation

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Transcatheter aortic valve implantation (TAVI) is used to treat patients with severe symptomatic aortic stenosis at intermediate to very high surgical risk or with contraindications to surgical aortic valve replacement. The transapical access is the second most widely used approach in TAVI. It has been perceived as the most invasive access and connected with a higher risk of complications as compared with the femoral access.[1,2]

An 84-year-old male with severe symptomatic aortic stenosis and a history of coronary artery bypass grafting 6 years earlier was scheduled for TAVI because of a high surgical risk. Due to the previous implantation of the stent graft to the abdominal aorta, the transapical access was chosen for TAVI. A 26-mm Edwards Sapien 3 transcatheter heart valve (Edwards Lifesciences, Irvine, California, United States) was successfully implanted. Standard transthoracic echocardiography (TTE) performed 4 weeks after the implantation confirmed good function of the implanted valve (peak and mean transvalvular gradients of 24.5 mm Hg and 13.3 mm Hg, respectively, with an effective orifice area of 1.8 cm^2) with a left ventricular ejection fraction of about 50%.

Surprisingly, a pseudoaneurysm in the apical region of the left ventricle was found. The presence of a connection with the left ventricle by a channel (FIGURE 1A) and a bidirectional flow was confirmed (FIGURE 1B). Importantly, the pseudoaneurysm was not observed on follow-up echocardiography a few days after the procedure. Because of the low quality of TTE images, multislice computed tomography (MSCT) was performed, which confirmed the presence of pseudoaneurysm—localized, contrast-filled outpouching (18 × 19 × 17 mm) with a narrow neck (width of 1–2 mm) (FIGURE 1C and 1D). The patient reported a reduction of symptoms (from New York Heart Association class III to I) and no potential pseudoaneurysm-related symptoms since TAVI. Because of the high risk of another procedure

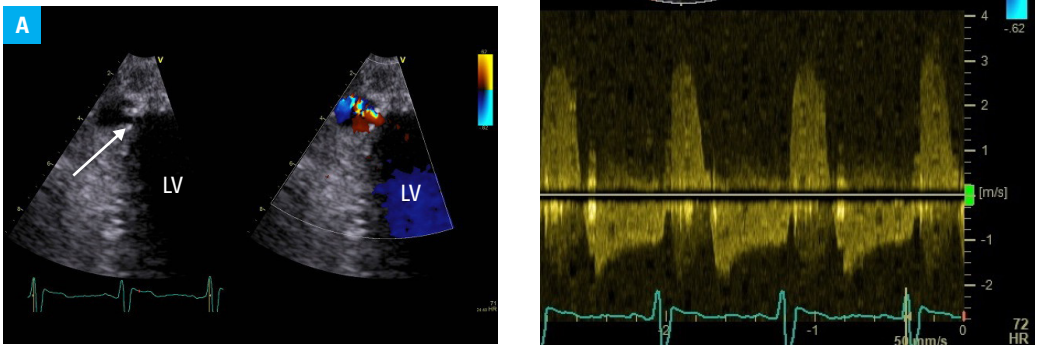

FIGURE 1 Transthoracic echocardiography of the pseudoaneurysm; **A** – a 2-chamber apical projection showing the channel connecting the pseudoaneurysm with the left ventricle (arrow); **B** – a bidirectional flow revealed in the channel connecting the pseudoaneurysm with the left ventricle
Abbreviations: LV, left ventricle

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Received: October 9, 2017.
Revision accepted: December 8, 2017.
Published online: December 8, 2017.
Conflict of interest: none declared.
Pol Arch Intern Med. 2018; 128 (1): 62-63
doi:10.20452/pamw.4164

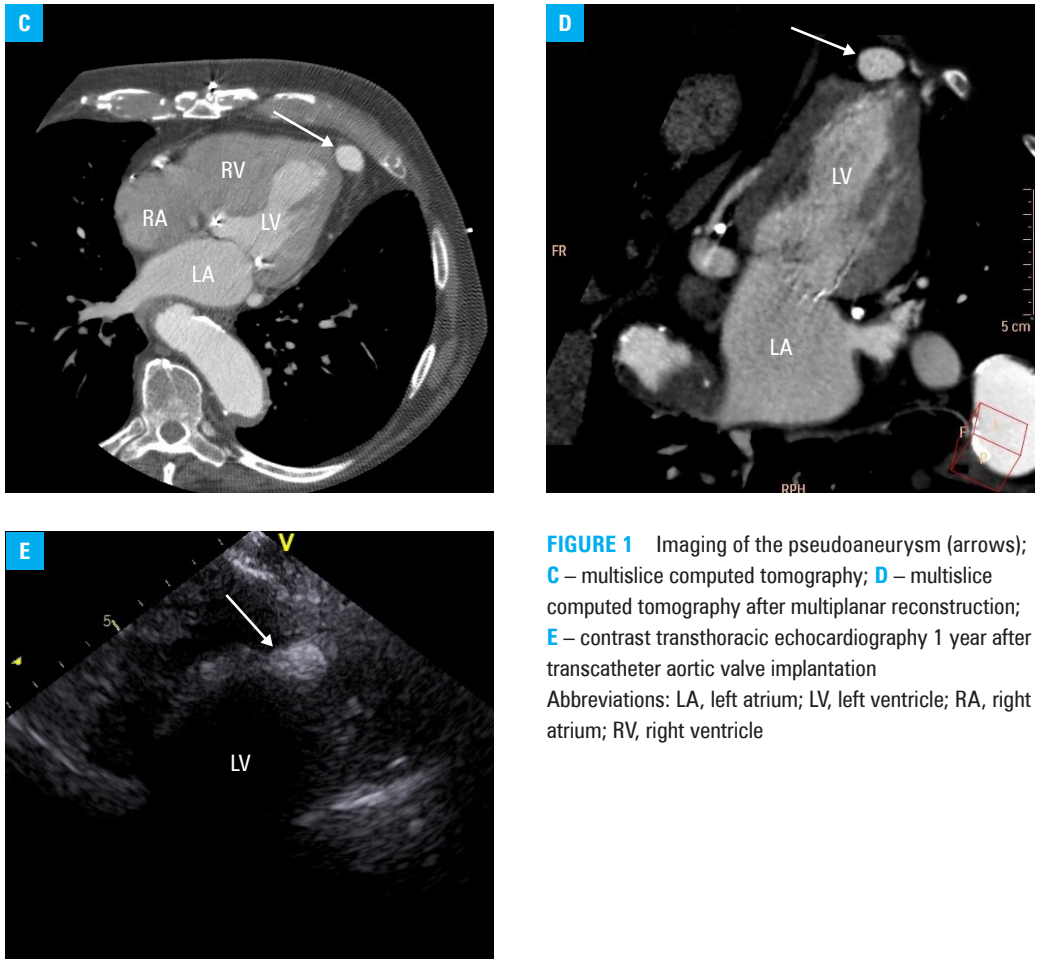

FIGURE 1 Imaging of the pseudoaneurysm (arrows); **C** – multislice computed tomography; **D** – multislice computed tomography after multiplanar reconstruction; **E** – contrast transthoracic echocardiography 1 year after transcatheter aortic valve implantation
Abbreviations: LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle

and no progression of the pseudoaneurysm, the patient was considered ineligible for surgery and was scheduled for a regular echocardiographic follow-up. He received dual antiplatelet therapy; however, a month after TAVI, clopidogrel was discontinued due to the diagnosis of a left ventricular pseudoaneurysm. He did not require an oral anticoagulant. A gradual decrease in the size of the pseudoaneurysm was observed 3 and 6 months later. One year after TAVI, contrast TTE for better visualization and assessment of the pseudoaneurysm was performed (FIGURE 1E).

Left ventricular apical pseudoaneurysm is an infrequent complication of TAVI, occurring in less than 1% of the procedures via the transapical route.[3] In previously published cases, a TAVI-related pseudoaneurysm required surgical repair[4] or percutaneous closure.[3] However, similarly to our case, a conservative treatment seems possible in selected cases.[5] A regular echocardiographic follow-up after TAVI, especially in patients treated via the transapical approach, is necessary to recognize complications, including a potentially fatal apical pseudoaneurysm. MSCT should be performed to expand the diagnostic workup or in case of doubt. Furthermore, an MSCT examination precisely shows the left ventricular wall, the size of the pseudoaneurysm, and the presence of additional connections. A decision on the treatment method of the pseudoaneurysm should be tailored to the individual patient, based on the results of all examinations and patient symptoms.

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