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How can we reduce complications associated with thrombolysis for prosthetic valve thrombosis?

To the Editor,

We would like to comment on the recent article entitled "Stuck aortic valve treated by reteplase in a Bentall patient." published in Anatol J Cardiol 2015; 15: 339-40 by Tanyeli et al. (1), in which the use of reteplase in a patient with a stuck aortic mechanical valve is reported. We believe there are some major drawbacks to be addressed regarding the diagnostic algorithm and the treatment of choice.

Although guidelines have recommended surgery for PVT (2), we recently reported that low dose (25 mg) and slow infusion (6 h) of recombinant tissue plasminogen activator (t-PA) are very safe and are associated with a very high success in this regard (3, 4). In this study, repeated low-doses and slow infusions of alteplase regimen under the guidance of serial transesophageal echocardiography (TEE) was superior to faster infusion thrombolytic therapy (TT) protocols. In the current report, a patient with aortic PVT was administered double-bolus reteplase, which may be a very rapid TT regimen that may have resulted in a major embolism and/or hemorrhage. Thromboembolism due to rapid TT of PVT is well-recognized, and we respectfully suggest that clinicians should avoid the routine use of such a regimen. Rapid thrombolysis should only be reserved for certain circumstances, including critically ill patients with PVT or those with stroke (5) or acute myocardial infarction. Furthermore, the authors state that they pre-treated the patient with unfractionated heparin (UFH) and acetylsalicylic acid immediately before the first dose of reteplase and that it was continued thereafter. We reported that the safety of thrombolysis is related to prolonged infusion of t-PA without bolus and without concomitant UFH infusion (3, 4). We feel that the rapid infusion of t-PA with bolus dose and concomitant UFH jeopardizes PVT patients who may suffer risks of hazardous consequences (death, embolism, hemorrhage).

TEE should play a central role in every step of the management of patients with PVT, including the initial diagnosis, guiding the therapy, and evaluating the outcome. However, in the current report, the authors used only transthoracic echocardiography for the clinical decision-making of the patient with obstructed aortic PVT, which may be misleading. Fluoroscopy is frequently used to assess the leaflet motion in patients with PVT. However, the detection of the cause of leaflet blockade is not detectable during the catheterization study. Interestingly, the authors stated that they detected a huge thrombus burden resulting in severe aortic stenosis in the catheterization laboratory. The use of TEE is indispensable for the quantitative visualization of thrombus. On the other hand, the evaluation of the severity of obstruction in patients with aortic PVT should almost always include quantitative data beyond the maximum gradient, including the effective orifice area, dimensionless valve index, acceleration time, and acceleration/ejection time.

We believe that the management of patients with PVT should be evidence based, and current evidence strongly suggests the use of low-dose and slow infusion of TT protocols without bolus and without concomitant anticoagulant therapy in patients with PVT. Furthermore, heparin should be continued with warfarin until INR reaches a level of 2.5, rather than only 48 h after successful TT.

While this case is interesting, a good outcome in a single patient certainly does not prove that the approach used is broadly applicable.

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Author`s Reply

To the Editor,

We acknowledge the authors for their kind criticism regarding some complaints about our strategy of the stuck valve in our Bentall

patient in the article entitled "Stuck aortic valve treated by reteplase in a Bentall patient." published in Anatol J Cardiol 2015; 15: 339-40 by Tanyeli et al. (1). In a patient with prosthetic valve thrombosis, thrombolysis, thrombectomy, or prosthetic valve re-replacement is the currently available option (2). Firstly, the patient's complaints were acute and life-threatening with a possible acute myocardial infarction. In our paper, we stated that the patient had a huge thrombus material blocking the movement of the aortic valve with resultant severe aortic stenosis; this detection was made in the catheterization laboratory with the aid of transthoracic echocardiography (TTE). Fluoroscopy showed total blockade of the aortic valve, and coronary angiography showed normal coronary angiogram. Although the cardiologists tried to perform transesophageal echocardiography, the patient could not tolerate the procedure. The patient was in acute hypotensive shock status and was immediately sent to our intensive care unit for operation. We thought that the patient had limited time because of total blockade of the aortic valve. Because the patient previously had a Bentall operation with a valved conduit due to aortic dissection, both exploration of the heart in a re-do surgery and excision of the graft material with the valve and coronary ostia would increase operative mortality because these procedures would need a certain period of time. As the authors stated, rapid thrombolysis should only be reserved for certain circumstances, including critically ill patients with prosthetic valve thrombosis or those with stroke or acute myocardial infarction (3), and our patient was in the category of being critically ill. That is the reason we used the rapid infusion strategy, and in case the thrombolysis was unsuccessful, we would immediately take the patient to the operation theater, which had a high risk of mortality. We totally agree with the authors that a slow infusion strategy could be more beneficial in a more stable patient. After bedside evaluation of the patient with TTE, even a small amount of aortic valve motion dramatically improved the patient's status. Unfractionated heparin was continued for 48 h; thereafter, the patient was on enoxaparin sodium treatment until INR reached 2.5 with oral warfarin treatment.

We agree that such a single case with a good outcome cannot prove that our strategy is universally applicable; however, we also stated that any cardiologists and cardiac surgeons should always be in close collaboration with decision making with the aid of universally accepted guidelines. The patient's critical status and the risk taken by the operative strategy should never overcome the risk taken by the medical decision-making. This is the reason we stated that thrombolytic therapy (in this case, reteplase) may be kept in mind in re-functioning of the stuck mechanical valves, particularly in high-risk patients.

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Transcatheter aortic valve implantation for severe pure aortic regurgitation: looking beyond the image

To the Editor,

The growing worldwide experience with TAVI has given rise to several off-label indications. Pure severe native aortic valve regurgitation without aortic stenosis is one of these off-label indications. However, clinical experience is limited worldwide (1-3). The results of this limited experience showed that although it is feasible in patients ineligible for surgery, there are many technical difficulties to overcome. Large annulus size and absence of calcification may cause reduced fixation of the valve at the annulus during deployment. In addition, the increased frequency of requiring two valves and leaving a significant residual aortic regurgitation are important concerns of the procedure (4, 5).

Awareness of technical difficulties and knowing tips to overcome these will help operators to have better procedural outcomes in such patients.

In this report, we aimed to mention our TAVI experience and some specific technical issues that were encountered in a pure severe aortic regurgitation patient; this was the first case in Turkey. The patient was an 85-year-old man with a severely dilated left ventricle and EF of 40%. The aortic valve was tricuspid and minimally calcified. The patient had several concomitant diseases and a high surgical risk that the off-label application of TAVI was decided. Cardiac CT revealed an annulus with 25.9 x 31.2 mm dimensions, which were in the upper limit for available prostheses. During the procedure, a 31-mm CoreValve prosthesis dislocated into the aorta in the first attempt. The prosthesis was successfully retrieved and reloaded. In the second attempt, the implantation was aimed at a slightly deeper position. The lower 2/3rd portion of the device was unfolded in the first step enabling prosthetic valve function. At this step, prosthesis did not obtain the expected coaxial alignment. The fluoroscopic image suggested a malopposed valve. Despite this image, the hemodynamic profile unexpectedly got better with prominent dicrotic notches on aortic pressure tracing. Relying on this hemodynamic evidence of properly functioning aortic valves, we continued deploying the upper 1/3rd portion of the device. After full deployment and release of the prosthesis, both fluoroscopic and hemodynamic images were perfect with no residual AR. A control after 6 weeks showed the stable position of the prosthesis with no paravalvular regurgitation.

This case demonstrates the importance of hemodynamic monitoring during TAVI. In a very critical step, we conducted the procedure by hemodynamic guidance rather than a sole fluoroscopic guidance, which yielded a perfect procedural outcome. This phenomenon has never been described in previous literature. We think that in such technically demanding patients in whom the optimal fluoroscopic position-