Ultraslow thrombolysis for subacute mitral prosthetic valve thrombosis

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We present a case of a 66-year-old frail female patient who was admitted to the cardiology department on account of dyspnea on exertion lasting several weeks (New York Heart Association class III). The past medical history involved permanent atrial fibrillation and rheumatic valvular heart disease comprising severe mitral and aortic valve stenosis, treated with percutaneous mitral commissurotomy in 1998 and implantation of a Sorin Bicarbon 27 mitral prosthetic valve in 2004, and subsequent implantation of a St. Jude Regent 21 aortic prosthetic valve in 2018. The patient had also undergone hemicolectomy and adjuvant chemotherapy for colon adenocarcinoma several months before current hospitalization with a labile international normalized ratio in the peri- and postoperative period. Upon admission to the hospital, a normal C-reactive level, white blood cell count, and the therapeutic international normalized ratio were documented. Transthoracic echocardiography with a pulsed-wave Doppler showed an increased maximal mitral flow velocity of 2.8 m/s with a mean pressure gradient (MPG) of 15 mm Hg (Figure 1A), and Doppler velocity index >2.2, consistent with impaired movement of one of the discs of the mitral prosthetic valve (Figure 1B) and normal function of the aortic prosthetic valve. Fluoroscopy delivered evidence of disc blockage in the mitral prosthetic valve (Figure 1E). Transesophageal echocardiography confirmed impaired movement of the mitral prosthetic valve related to probable thrombosis accompanied by an increased echocardiographic pattern of the valve consistent with pannus. Initial intravenous infusion of unfractionated heparin did not provide symptomatic relief or a decrease of the mitral MPG. Given the high operative risk reflected by EuroSCORE II of 14% and high bleeding risk, double ultraslow low-dose infusions of alteplase at a dose of 25 mg over 25 hours were applied, interrupted by a 6-hour unfractionated heparin. The total dose of alteplase was 50 mg. After 3 days of therapy, a significant reduction of dyspnea, improvement in physical capacity, normalization of prosthesis motion, and an MPG reduction to 9 mm Hg (Figure 1C–D) were documented. No bleeding complications were reported. The subsequent course of in-hospital stay was uneventful, and the patient was discharged home on the 11th day. During a follow-up visit one month later, the patient reported only mild dyspnea on exertion (New York Heart Association class II) while the mitral MPG remained stable, which might be attributed to chronic pannus.

The ultraslow low-dose thrombolytic scheme was demonstrated to have a low risk of causing significant major clinically relevant bleeding and a roughly 90% efficacy rate [1]. The presented case shows the feasibility of prolonged ultraslow infusion with an overall higher dose of alteplase, which was uncomplicated and led to clinical improvement. Ultraslow thrombolytic therapy may be an alternative treatment option for patients with prosthetic valve thrombosis and high perioperative risk.

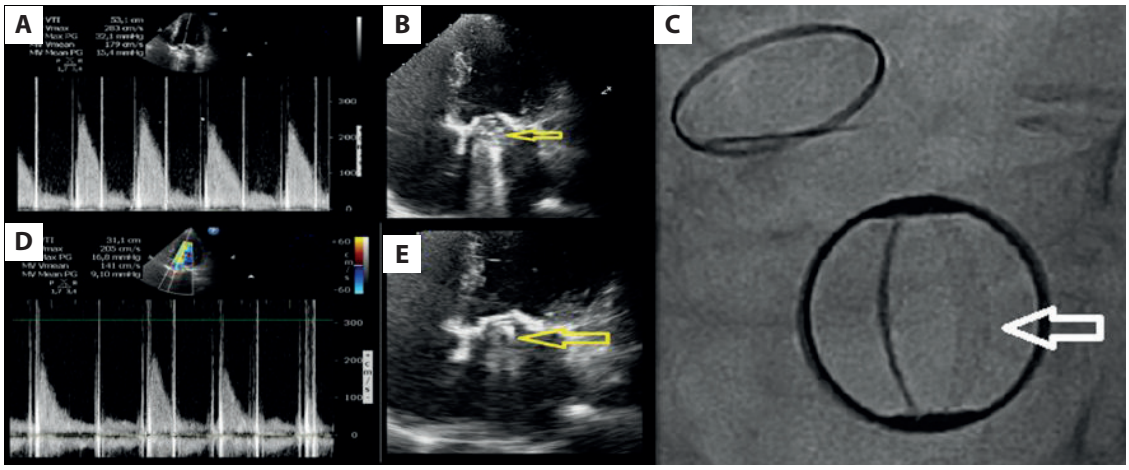

Figure 1. A. Transthoracic echocardiography (TTE); mitral inflow velocity by pulsed-wave Doppler. **B.** Image of the blocked disc of the mitral prosthetic valve (4-chamber view). **C.** TTE, mitral inflow velocity by pulsed-wave Doppler following ultraslow alteplase infusion. **D.** TTE, resolution of the abnormal motion of the disc of the mitral prosthetic valve. **E.** Fluoroscopy; impaired movement of one of the discs of the mitral prosthetic valve (LAO 37, CRA 17)

Article information

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