

Thrombolysis in the Obstructed Prosthetic Tricuspid Valve: Importance of the Site of Prosthetic Valve and the Patient's Adherence with Anticoagulation Therapy

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ABSTRACT

A prosthetic valve thrombus that occludes the blood flow or interferes with the valvular function is a rare, but life-threatening complication after prosthetic valve replacement. The patient's adherence with taking his anticoagulant medication is most critical. However, as seen in this presentation, the location of the prosthetic valve at the supra coronary sinus site may also be important. For the patient in this study, the blood flow and the speed of the flow through the valve were significantly reduced because the flow from the coronary sinus bypassed the prosthetic valve. This particular location of the prosthetic valve may be one of the risk factors that caused the thrombus. The right-sided prosthetic valve thrombus was successfully treated by thrombolysis with using urokinase, and there was no evidence of pulmonary embolism. (**Korean Circulation J 2006;36:162-163**)

KEY WORDS : Prosthetic valve thrombus ; Thrombolytic therapy ; Fluoroscopy.

Introduction

Prosthetic valve thrombus (PVT) denotes any thrombus that forms at or near an operated valve and it occludes blood flow or interferes with the valvular function in the absence of infection.¹⁾ Although maintaining a proper level of anticoagulation in the blood is most critical, this rare but life-threatening complication of prosthetic valve replacement may depend on the structure and location of the mechanical valves, as well as the patient's compliance with taking their anticoagulation medicine.²⁾³⁾ Because the patients with suspected PVT have a variety of clinical presentations, it may be misleading to rely on only one test for the diagnosis. Especially, cine-fluoroscopy, as compared with Doppler echocardiography, may identify the patients with hemodynamically significant PVT.⁴⁾

We report here on a case of prosthetic tricuspid valve thrombosis that was due to the specific location of the valve and the patient's poor compliance with taking his anticoagulation medicine. He was successfully treated with thrombolysis.

Case

A 30-year-old man was admitted to our hospital because of low cardiac output and right heart failure. He had undergone tricuspid valve (TV) replacement nine years ago with an ATS valve at the position of supra coronary sinus because of subacute infective endocarditis. After then, he had no regular follow-up, and he had not been taking his warfarin medication for the recent two months. On physical examination, his blood pressure was 80 mmHg in systole, his skin was cold and his jugular vein was distended to the mandibular angle, which suggested low cardiac output. There was no "click" sound from the prosthetic valve. On initial transthoracic echocardiography (TTE) done at the emergency room, the TV leaflets were surrounded by thrombus and they were almost fixed without any motion. Moderate tricuspid regurgitation was also observed. The mean pressure gradient between the right atrium and right ventricle, which

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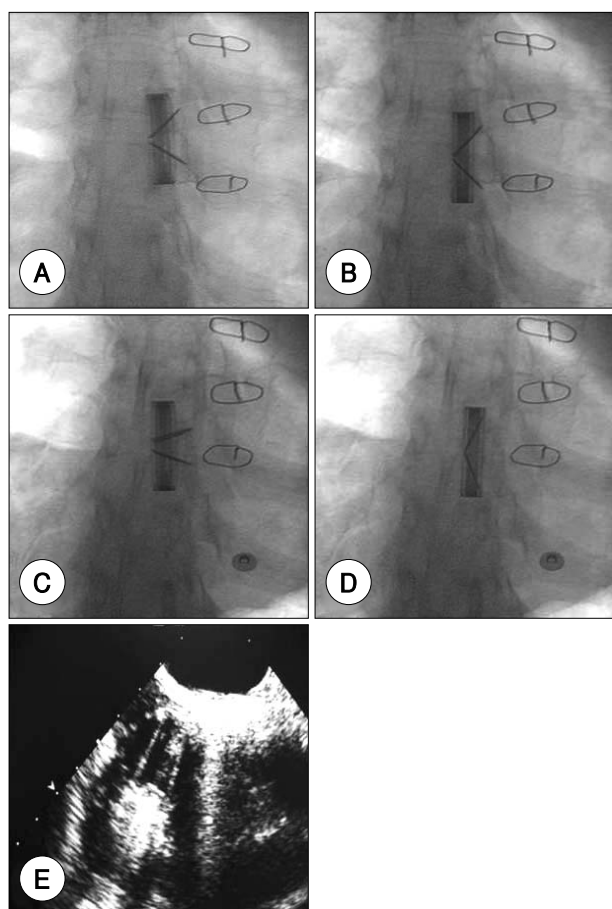


Fig. 1. Cine-fluoroscopic and TEE findings before and after thrombolysis. On cine-fluoroscopy, the TV motion was limited and almost fixed in diastole (A) and systole (B). 24 hours after performing thrombolysis with urokinase, the prosthetic tricuspid valve leaflet had no limitations of motion during diastole (C) and systole (D). On the following TEE, the TV leaflets moved without any limitation, and any thrombus around the TV was not found (E). TEE: transesophageal echocardiography, TV: tricuspid valve.

was measured from the tricuspid flow with using continuous wave (CW) Doppler, was about 8.7 mmHg. On cine-fluoroscopy, the TV motion was limited and almost fixed (Fig. 1A, B). Immediately after admission, thrombolytic therapy using urokinase was started for the treatment of the obstructed prosthetic TV; urokinase 4,400 IU/Kg was loaded intravenously and this was followed by 4,400 IU/kg/hour for 24 hours. The “click” sound of the prosthetic valve was audible from 18 hour after the initial urokinase infusion. On the cine-fluoroscopy done after thrombolytic therapy, the prosthetic TV leaflets displayed no limitations of motion (Fig. 1C, D). On the following transesophageal echocardiography (TEE), the TV leaflets moved without any limitation, and any thrombus around the TV was not found (Fig. 1E). The mean pressure gradient between right atrium and right ventricle was decreased to 1.8 mmHg on the CW Doppler. There was no evidence of pulmonary embolism on

the chest CT. The patient was discharged without any complications.

Discussion

When a diseased heart valve is replaced with a prosthetic valve, the frequency of serious complications like valve thrombosis depends upon the valve type and valve position, and also on multiple risk factors.

In the present case, the patient’s prosthetic valve was located at the supra coronary sinus. This seems to have caused a reduction of both the blood flow and the speed of flow through the valve because of the blood bypassing the valve and the direct flow of the blood volume to the right ventricle from the coronary sinus. This particular location of the prosthetic valve may have been one of the risk factors that caused the thrombus.

Because the patients with suspected PVT have various clinical presentations, it may be misleading to rely on only one test for making the diagnosis. So, cine-fluoroscopy and TTE are the quick, effective, and complementary diagnostic methods to diagnose PVT in most patients.⁵ Especially, performing cine-fluoroscopy, as compared with Doppler echocardiography, may identify the patients with hemodynamically significant PVT.⁴ TEE still remains the gold standard technique for the management of PVT.⁶

Nowadays, thrombolysis has evolved as an alternative treatment to surgery for PVT, and it has become the first-line treatment for all patients with PVT.³ Thus, we suggest that immediate intravenous thrombolytic therapy should be performed for the patients who are critically ill with right-sided PVT.

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