

Severe dysfunction of a mechanical mitral valve prosthesis coexisting with non-ST-segment elevation myocardial infarction

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We report a case of a 66-year-old woman presenting with acute dyspnea (New York Heart Association functional class II/III) and typical angina (Canadian Cardiovascular Society grade II/III), referred from a district hospital with a suspicion of non-ST-segment elevation myocardial infarction (NSTEMI).

The patient received dual antiplatelet therapy (aspirin, 300 mg and ticagrelor, 180 mg; initial doses) prior to transfer. She had undergone mitral valve replacement with a mechanical prosthesis (SJM 27; St. Jude Medical, St. Paul, Minnesota, United States) 8 years previously due to mitral stenosis and had the valve replaced again with an ATS Medtronic 28 prosthesis (Medtronic, Minneapolis, Minnesota, United States) due to thrombosis 2 years later. On admission to the department the patient was dyspneic, but did not report any significant chest pain. Laboratory tests revealed elevated levels of cardiac troponin T (0.134–0.113 ng/ml; reference range, <0.014 ng/ml) and N-terminal pro-B-type natriuretic peptide (31 769 pg/ml; reference range, 0–125 pg/ml). International normalized ratio was within the therapeutic range (3.0); however, it had been noted to be subtherapeutic during previous weeks. Standard electrocardiogram (ECG) showed ST-T wave changes suggestive of NSTEMI; however, these changes were transient. Urgent transthoracic echocardiography revealed an immobile mitral prosthetic disc, with significantly increased transmitral gradients (peak and mean gradients, 40 and 31 mm Hg, respectively) and a high Doppler velocity index (7.6),

indicating possible prosthetic valve thrombosis. In addition, there were regional wall motion abnormalities of the left ventricle, interventricular septum, and inferolateral wall. The left ventricular ejection fraction was 50%. Three-dimensional transesophageal echocardiography revealed a severe dysfunction of the mitral prosthesis. One of the discs of the prosthesis was immobile (FIGURE 1A) due to a large (>1 cm) mass located on the ventricular side, likely thrombotic in nature (FIGURE 1B). A very turbulent inflow to the left ventricle was observed on color Doppler (FIGURE 1C) and fluoroscopy confirmed obstruction of the mitral prosthesis (FIGURE 1D). Infusion of unfractionated heparin was commenced immediately. Due to the suspicion of NSTEMI and an urgent cardiac surgery planned, the patient also underwent coronary angiography, which showed no evidence of coronary artery stenosis or thrombus. During the cardiac surgery performed on the eighth day after admission, a thrombus and pannus were found on both sides of the prosthetic valve (FIGURE 1E and 1F) and a reimplantation of a Hancock 27 bioprosthetic valve (Medtronic) was performed through right minithoracotomy on a fibrillating heart.

Dysfunction of a mechanical heart valve prosthesis is an infrequent but potentially lethal complication of valve replacement,^{1,2} requiring urgent treatment. Thrombosis of a mechanical prosthetic valve may rarely coexist with myocardial infarction caused by coronary embolism,³ most often resulting in ST-segment elevation myocardial infarction, however, sometimes also leading to NSTEMI.⁴

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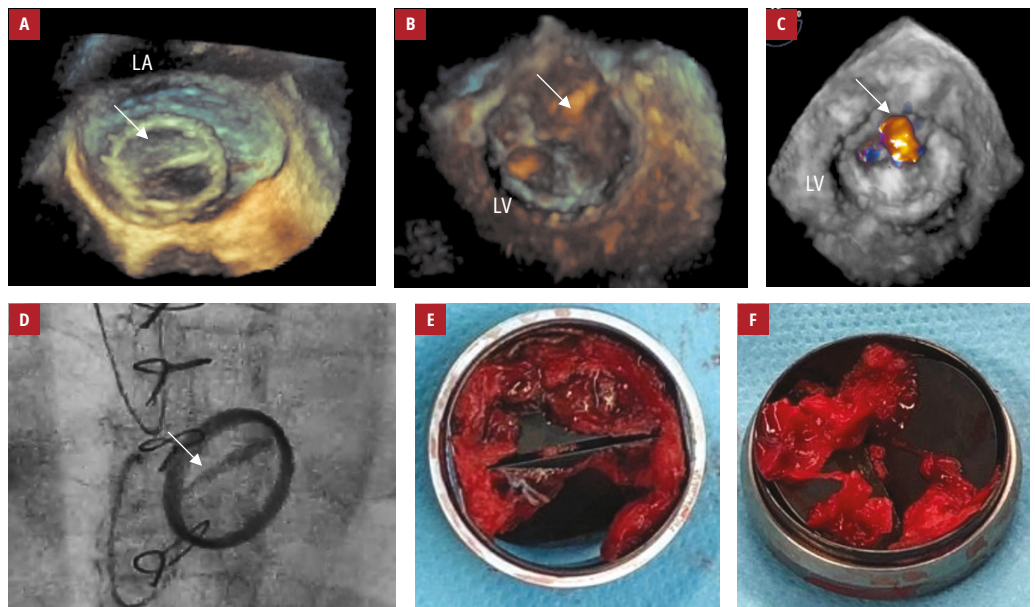


FIGURE 1 **A** – an immobilized mitral prosthesis disc (arrow); 3-dimensional transesophageal echocardiography (3D TEE), left atrial view; **B** – pathological masses on the valve prosthesis (arrow); 3D TEE, left ventricular view; **C** – turbulent mitral valve inflow (arrow); color Doppler, 3D TEE, left ventricular view; **D** – a blocked mitral prosthesis disc visible on fluoroscopy (arrow); **E** – an explanted mitral valve prosthesis with thrombus (ventricular surface); **F** – an explanted mitral valve prosthesis with thrombus and pannus (atrial surface)
Abbreviations: LA, left atrium; LV, left ventricle

In this patient with mechanical valve thrombosis coexisting with chest pain, transient ECG changes, left ventricular wall motion abnormalities, and elevated cardiac biomarkers, with a typical dynamic, we considered coronary embolism as a possible cause of NSTEMI (type 2 of myocardial infarction); however, no thrombus was detected during coronary angiography.

In conclusion, it is reasonable and compliant with the guidelines¹ to perform echocardiography prior to angiography in all patients with suspected NSTEMI. However, in patients with an implanted mechanical mitral valve prosthesis, a careful evaluation of the prosthesis should be performed, because myocardial infarction may be secondary to its dysfunction.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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