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# When coronaries are victims of prosthetic heart valve: A case report

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***Abstract:*** *Metallic prosthetic valve may be a source of thromboembolic complications, especially in the context of inadequate anticoagulation. We report the clinical case of an acute coronary syndrome with ST-segment elevation secondary to non-obstructive thrombosis of a mitral mechanical prosthesis.*
***Keywords:*** *Myocardial infarction; Coronary embolism; Prosthetic valve thrombosis*

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## I. Introduction:

Coronary embolism from a prosthetic heart valve thrombosis represent a small proportion of intracoronary thrombi's etiologies, especially in the absence of obvious iatrogenic or infectious cause. This clinical case reports the discovery of coronary thrombi whose origin is an embolism from an isolated thrombus in mechanical mitral valve prosthesis.

## II. Case report :

A 52 years old male, without cardiovascular risk factor, presented to the emergency department with constant chest pain of 15 h duration.Previously, he had a history of dual prosthetic heart valve 11 years ago. The electrocardiogram showed Q waves in the anterior territory with negatives T waves (Figure 1).

Coronary angiography revealed healthy coronaries with an image suggestive of a non occlusive thrombus in the proximal segment of the left anterior descending coronary artery (LAD) (Figure 2). The patient was given Tirofiban and intravenous unfractionated Heparin for 48 hours.The international normalized ratio at admission was was in the sub therapeutic range (INR=1.4), and troponin-T was 132 ng / ml.Tran thoracic echocardiography (TTE) done the following day, showed a good hemodynamic profile of the mitral prosthesis (Vmax at 1.6 m / s, mean transprosthetic gradient = 4 mmHg), a good hemodynamic profile of the aortic prosthesis (Vmax at 3 m / s, mean transprosthetic gradient at 19 mmHg). Left ventricle was unexpanded, non-hypertrophied, with akinesia of the anteroseptum and Inferoseptum walls with an ejection fraction of 45%.This examination was completed by a transesophageal echocardiography showing echodense masse attached to the mitral prosthesis, measuring14 mm (Figure 3). The coronary angiography control after 72 hours of antithrombotic treatment showed a complete disappearance of the thrombus of the proximal segment of the left anterior descending coronary artery, with healthy coronary appearance (Figure 4).

The diagnosis of non-obstructive thrombosis of the mitral prosthesis complicated by myocardial embolic infarction was retained.Transesophageal echocardiography performed before discharge and after adjustment of the anticoagulant treatment showed a disappearance of the thrombus with persistence of a small element of 4 mm (Figure 5).Therapeutic education on vitamin K antagonists has been reminded to the patient.

## III. Discussion:

Coronary artery disease is overwhelmingly atherosclerotic and acute coronary syndromes with ST segment elevation (ACS ST +) most often result from atheromatous plaque rupture [1]. In some cases, the physiopathological mechanism is different. Indeed, an angiographically normal coronary network is found in 1 to 12% of cases, with different physiopathological mechanisms (non-apparent atheroma, spasm, embolization, inflammation, hypercoagulability or cardiomyopathy: Tako-tsubo , myocarditis) [2].Cases of coronary embolism are rare and often of iatrogenic origin [3] in left cardiac catheterization procedures with or without angioplasty or in atrial fibrillation ablation procedures [4] other causes of coronary embolism may be related to microemboli from infectious endocarditis [5], thrombotic material on aortic or mitral valve prosthesis (the case of our patient), a mitral stenosis atrial fibrillation [6], or more rarely intracardiac myxoma . In autopsy studies of

patients with active endocarditis, the presence of septic emboli in the coronary arteries reached nearly 60% of patients [5].

Acute myocardial infarction (AMI) by coronary embolism is considered rare. The explanations given refer to the narrowness of the coronaries in relation to the diameter of the aorta and the importance of the aortic flow, to the diastolic filling of the coronaries, whereas the greater part of the aortic flow is in systole; protection of coronary ostia in systole by the opening of the aortic sigmoids.

The majority of emboli (75%) involve left coronary artery system [7]. This is due to its larger size, the angle of implantation of the left coronary less acute than right coronary artery system [6].While early work has been autopsic, recent publications collect in vivo observations, since proliferation of coronary angiography, particularly in cases of acute coronary syndrome (ACS).

These recent publications, like ours, most often produce "suspicions of coronary embolism". The criteria in principle required are:

• The coronary appearance;

• Identification of the origin of the thrombus (ultrasound, CT scan, MRI);

• Endocoronary ultrasound with demonstration of normality of the intima would be the third criteria.

Endocoronary ultrasonography was not performed in our patient.

However, the absence of coronarography stenosis immediately after clot lysis or at a distance is an accepted argument for diagnosis in our case.

The incidence of major embolic events in patients with a prosthetic valve is 1% when treated with warfarin [8] on an autopsy series of coronary embolisms in valvular, 8% are noted in patients with prosthesis [9].

The risk of embolism is greater in the case of mitral prosthesis, starring prosthesis or multiple prosthetic heart valves [10,11]. Other factors that increase the risk of embolism with prosthetic valves are age greater than 70 years, atrial fibrillation and decreased left ventricular function [12].

Non-obstructive thromboses, like the case of our patient, are better diagnosed with transesophageal echography [13,14]. Inadequate anticoagulation is the most frequently involved factor [15] also found in our patient. The therapeutic education of patients with prosthetic valves is one of the major preventive strategies of these serious, sometimes fatal, embolic accidents.

## IV. Conclusion:

Myocardial infarction secondary to mitral prosthetic thrombosis is probably underestimated and often occurs in the presence of inadequate anticoagulation.Therapeutic education is necessary to prevent these complications.

**Consent:**

Written informed consent was obtained from the patient for publication of this case report and any accompanying images

**Competing Interest**

The authors declare that they have no competing interests.

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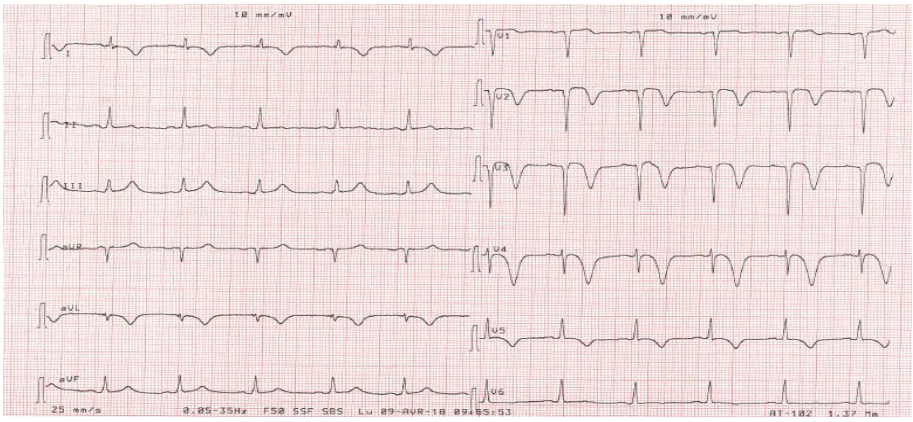

**Figure 1:** Electrocardiogram recorded during the patient's arrival in emergency department showing Q waves and negative T waves in Anterior territory

**Figure 2:** Right anterior oblique incidence (RAO) showing a thrombus in the proximal segment of the left anterior descending coronary artery (LAD) with TIMI3 flow.


**Figure 3**: Transoesophagial echography showing a thrombus attached to the mitral prosthesis measuring 14 mm

**Figure 4:** coronary angiography control in right anterior oblique caudal view showing a complete disappearance of the thrombus of the proximal segment of the left anterior descending coronary artery

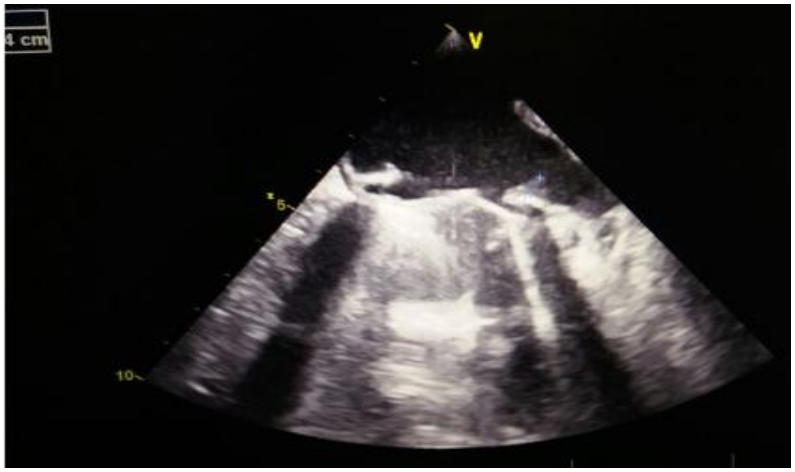


**Figure 5:** Transesophageal echocardiography performed after adjustment of the anticoagulant treatment showed a disappearance of the thrombus with persistence of a small element of 4 mm

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