

# Intermittent acute aortic valve regurgitation: a case report of a prosthetic valve dysfunction

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## KEYWORDS

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Complications of any mechanical prosthesis include thrombus or pannus formation. In our case report we demonstrate that prosthetic aortic valve regurgitation due to pannus formation may be intermittent and non-cyclic in pattern and therefore not obvious at the time of original clinical examination. Under these conditions and as transesophageal echocardiography cannot be repeated promptly, transthoracic 2-D and Doppler echocardiography should be available at any time when symptoms occur and present the method of choice for acute patient evaluation. Thrombolysis seems to be the first treatment of choice in case of thrombus formation and re-do surgery in case of pannus formation.

## Introduction

Complications of any mechanical prosthesis include thrombus or pannus formation.<sup>1</sup> Both require prompt diagnosis and treatment as they can be a life-threatening condition.<sup>1</sup> The presenting symptoms and clinical signs of these complications are consistent but non-specific and can include embolism, obstruction or acute valvular regurgitation of cyclic pattern.<sup>1,2</sup> Echocardiography is the diagnostic tool of choice in this acute setting.<sup>2</sup> In this report we present a case of non-cyclic failure in closure of a valvular leaflet resulting in acute massive aortic regurgitation.

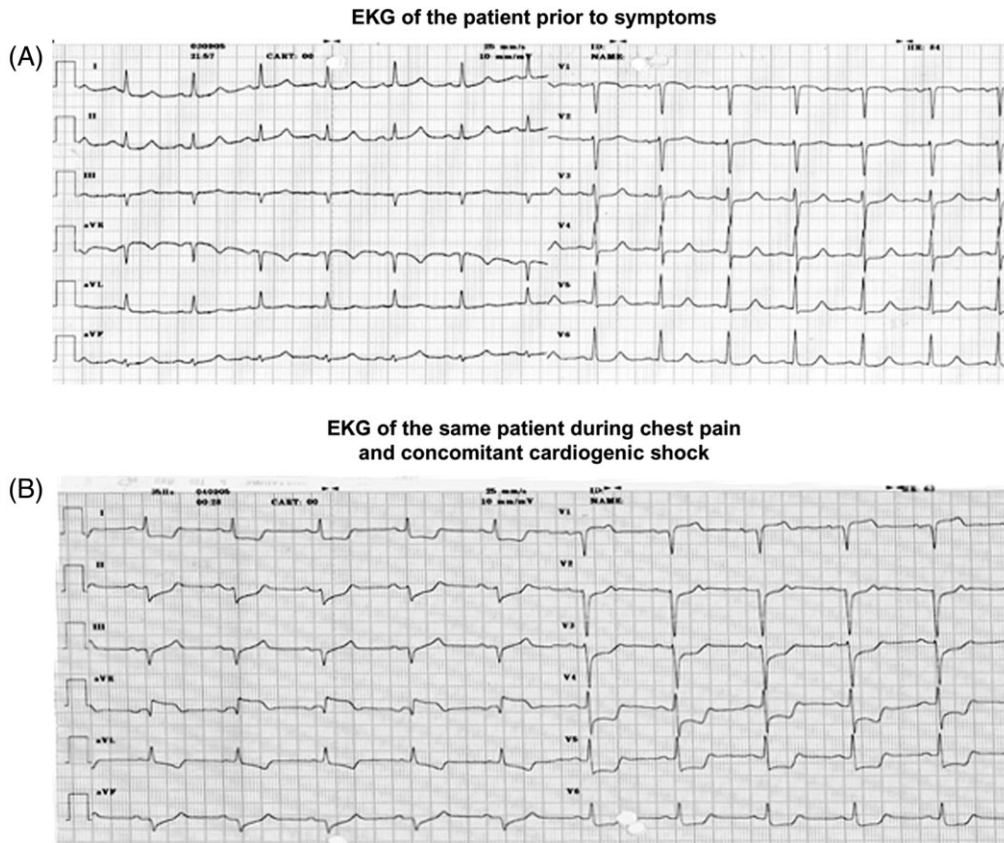
## Case study

A 44-year-old Turkish man was referred to the Onassis Cardiac Surgery Center in February 2006 because of unstable angina after non-ST elevation myocardial infarction. His medical history revealed aortic valve replacement with a single leaflet (tilting disc) No. 21 Medtronic Hall prosthesis in 2003 due to rheumatic aortic stenosis. On admission he was clinically stable with a normal electrocardiogram (EKG) (*Figure 1A*) and blood pressure of 120/80 mmHg, but with suboptimal INR value of 1.1, and elevated troponin-I value of 1.20 ng/ml (normal range: 0.00–0.05 ng/ml). Two

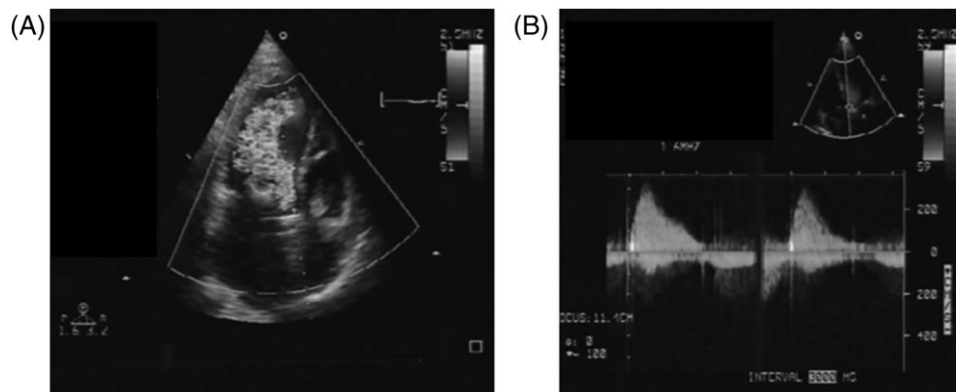
hours after admission and although on standard medical treatment for non-ST elevation myocardial infarction, he suffered a brief episode of unstable angina followed by severe hypotension (systolic blood pressure of 60 mmHg) and almost loss of consciousness and concomitant cardiogenic shock. He recovered spontaneously and a new EKG did not show any significant abnormalities. A transthoracic echocardiogram (TTE) revealed a normally functioning prosthetic aortic valve and almost normal left ventricular function. Transesophageal echocardiography (TEE) excluded the presence of thrombus or large tissue overgrowth in the prosthetic valve. A second longer episode of chest pain with the same clinical presentation was accompanied by remarkable ST depression in broad leads (*Figure 1B*). Coronary angiography and cinefluoroscopy that were performed after recovery of symptoms, showed normal coronary arteries and normally functioning aortic prosthesis.

TTE during a third longer episode with similar clinical presentation revealed massive acute aortic valve regurgitation (*Figure 2A, B*). Luckily the patient recovered spontaneously and was urgently transmitted to the operating theatre where he had a prosthetic aortic valve replacement with a No. 21 Edwards Mira Ultra Finesse mechanical valve. Abnormal pannus proliferation trapping the right ventricular side orifice of the mechanical aortic valve and causing intermittent acute aortic regurgitation was found. After the operation the patient had an uncomplicated recovery and was discharged on his 7th postoperative day.

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**Figure 1** EKG of the same patient (A) at baseline (no symptoms) and (B) during chest pain showing ST changes in precordial and lateral leads.



**Figure 2** (A) Apical 4-chamber view of the patient during chest pain and acute 4/4 grade aortic regurgitation. (B) Continuous-wave Doppler showing the triangular velocity profile of the acute aortic regurgitation. In these beats the valve stays open causing free aortic regurgitation.

## Discussion

We present a case of randomly repeated episodes of unstable angina with cardiogenic shock with spontaneous recovery, due to acute intermittent aortic regurgitation. The mechanical prosthesis had normal function at TTE and no evidence of thrombus or tissue at TTE during asymptomatic periods. However, pannus can cause intermittent complaints and TTE is the imaging modality of choice during the clinical episodes in order to detect these abnormalities. In that scenario clinical signs and auscultation may be confusing and unhelpful in the evaluation of the severity of valvular dysfunction. Murmurs may be heard in normally functioning valves whereas paravalvular regurgitation may

be silent.<sup>3,4</sup> Artifacts from the mechanical prosthesis may interfere with the observation of periannular morphology<sup>5</sup> during TTE. It has been also shown that when TTE fails to identify the reason of prosthetic malfunction, it is more often a small mass, usually pannus, interfering with the hinges of the prosthesis.<sup>5</sup> Treatment for these serious complications is controversial but thrombolysis seems to be the first choice in case of thrombus formation and re-do surgery in case of pannus formation.<sup>1,4</sup>

## Conclusion

Even in the presence of virtually normal function of a mechanical prosthesis, an intermittent noncyclic block that is not

obvious at the time of original clinical examination can occur due to pannus. Under these conditions and as TEE cannot be repeated promptly, transthoracic 2-D and Doppler echocardiography should be available at any time when symptoms occur and is the method of choice for acute patient evaluation.

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