



## Case Report

# An Unusual Case of Acute Myocardial Infarction

Ulugbek Ganiev<sup>1</sup>, Alfred Kocher<sup>2</sup>, Irene M Lang<sup>3\*</sup>

<sup>1</sup>Department of Intensive Care Medicine of the Republic Research Center of Emergency Medicine, Tashkent, Uzbekistan

<sup>2</sup>Department of Cardiac Surgery, Medical University of Vienna, Austria

<sup>3</sup>Department of Internal Medicine II, Division of Cardiology, Medical University of Vienna, Vienna, Austria

**\*Corresponding author:** Irene M Lang, Professor of Vascular Biology, Department of Internal Medicine II, Division of Cardiology, Medical University of Vienna, Währinger Gürtel 18-20, 1090 Vienna, Austria

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### Abstract

A 53-year-old male presented with acute coronary syndrome (ACS). Outside hospital coronary angiography a week ago had been normal. One year ago, patient had undergone aortic valve replacement with a bioprosthetic valve. Bedside echocardiography showed a rocking AV prosthesis. Patient underwent immediate valve surgery disclosing bioprosthetic ring endocarditis with partial ring detachment. ACS in prosthetic valve carriers should prompt early bedside TTE.

**Keywords:** Acute Coronary Syndrome; Prosthetic Valve Endocarditis; MINOCA

### Introduction

The clinical definition of acute myocardial infarction denotes the presence of acute myocardial injury detected by abnormal cardiac biomarkers, preferably hs-cTn, and clinical signs of myocardial ischemia, such as symptoms of myocardial ischemia, new ischemic ECG changes including the appearance of new pathological Q-waves, imaging evidence of loss of viable myocardium or identification of new coronary thrombus by angiography or autopsy. Apart from coronary causes, there are numerous conditions underlying myocardial injury such as heart failure, myocarditis, trauma, cardiac procedures, sepsis, infection, kidney dysfunction, acute pulmonary embolism, chemotherapy, radiation, hypertrophic cardiomyopathy and other structural heart disease. We are describing a patient presenting with chest pain, ECG changes, elevation of cardiac troponin and a new wall motion abnormality, finally classified as type 2 myocardial infarction [1] associated with prosthetic valve endocarditis. We highlight the role of echocardiography in non-invasive imaging of ACS [2].

### History of presentation: how the patient was admitted, physical examination

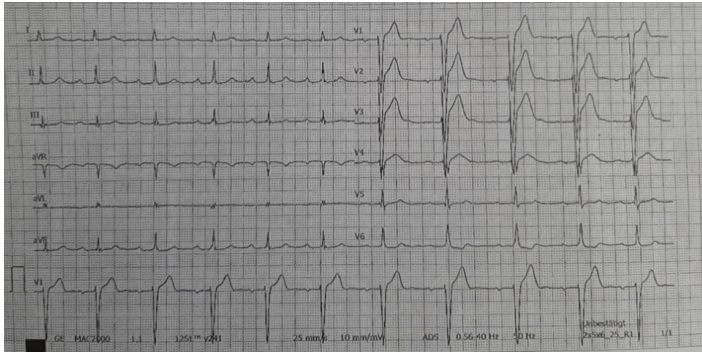
A 53-year-old male was admitted because of recurrent chest pain irradiating to the left hand and left shoulder, and hs-cTn

elevation. Electrocardiogram (ECG) in the asymptomatic patient showed elevated ST segments in V1-V3 and a loss of R-wave progression in V1-3 (Figure 1), compared with a previous ECG. On clinical examination, the patient was a pleasant man in excellent condition, bronzed from a recent holiday in Italy, without fever, chills or malaise. Except for a systolic murmur at the right sternal border physical examination was normal. On current admission hemoglobin was 10.7 g/dL (normal value 13,5-18,0 g/dl), white blood cell count was 20,29 G/L (normal value 4,0-10,0 G/L), CRP was 2.0 mg/dl (normal value <0,5 mg/dl), myoglobin was 1742 ng/ml (normal value 23-72 ng/ml), hs-cTn was 169 pg/mL (normal value 0-14 ng/L), and CK was 763 U/L (normal value < 190 U/L).

### Past Medical History

Patient had a history of systemic lupus, and had undergone aortic valve replacement with a biological prosthesis (25 mm Carpentier Edwards Inspiris) two years ago for aortic regurgitation. On the night when he had arrived at the Italian seaside four weeks ago, he had first noted abrupt precordial chest pain. He had been seen in a local hospital late that night, but was dismissed with a normal ECG and a hs-cTn around 300pg/mL, with the recommendation to consult with a cardiologist upon return home. The patient had followed the advice, and undergone cardiac catheterization two weeks ago, which was normal (Figure 2). Laboratory values at the time of the catheterization showed a white blood cell count of 12,8 G/L (normal value 4,0-10,0 G/L), NT proBNP of 344 ng/L

(normal value <125 ng/L), and Troponin I of 151 ng/L (normal value < 45,2 ng/L). TTE was reported as showing minimal mitral valve regurgitation and a prosthetic aortic valve, but no other abnormalities. Patient had been discharged same day because he was clinically well.



**Figure 1:** Electrocardiogram on current admission.



**Figures 2A and 2B:** Coronary angiography prior to current admission.

### Differential diagnosis

Differential diagnoses of the patient's condition are psychosocial derangements, metabolic disturbances including insulin-resistance, and inflammatory diseases [2].

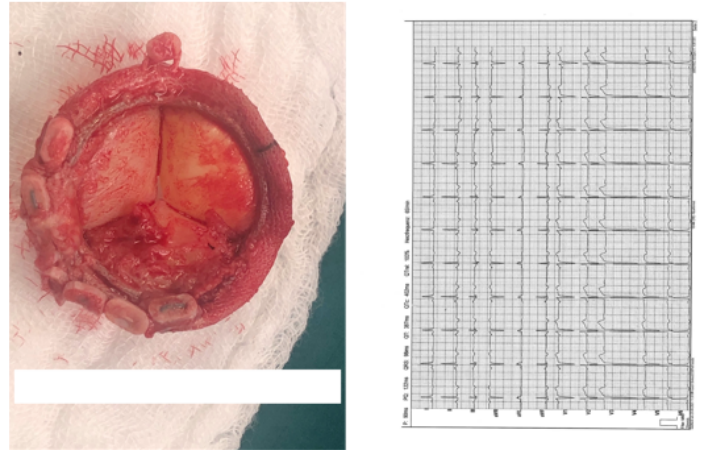
### Investigations

Bedside TTE in the emergency room showed a rocking motion of the AV prosthesis (Video 1), compared with a TTE 10 months before (Video 2). Furthermore, new apical dyskinesia was noted. Acute TEE confirmed combined aortic valve prosthesis stenosis and regurgitation resulting from partial ring detachment.

### Management (medical/interventions)

No cardiac catheterization was done. Instead, patient underwent immediate valve surgery. Vegetations on the ventricular

and aortic aspect of the non-coronary cusp of the AV prosthesis were found (supplemental Figure 1) with a perforating connection to the left ventricle. The non-coronary aspect of the valve ring was completely detached by a circumferential aortic ring abscess. The dysfunctional aortic valve prosthesis was replaced with an Edwards Inspiris Resilia-23 mm, including a patch reconstruction of the aortic annulus after cleaning the abscess cavity.



**Supplementary Figure 1:** Explanted aortic valve bioprosthesis with endocarditis lesions on the ventricular aspect of the valve.

### Patient Perspective

Patient had chest pain, was seen by two hospitals and three cardiologists, but remained without a diagnosis over one month. He had no symptoms of endocarditis, e.g. fevers, chills, fatigue or breathlessness.

### Discussion

In this case, imaging evidence of new partial dehiscence of the prosthetic valve and the clinical suspicion of silent LAD embolization favored the urgent diagnosis of prosthetic valve endocarditis (PVE). No major or minor Duke criteria were fulfilled prior to surgery [3], but pathological criteria confirmed the diagnosis of PVE [4]. PVE is a severe, life-threatening complication that accounts for 10–30% of all cases of infective endocarditis (IE) [5]. Patients with prosthetic heart valves are classified as a high-risk group for IE [4,6,7]. Peri-annular extension of the infection in IE is a serious and relatively common complication and is associated with high mortality [7]. The incidence of early PVE in the first 12 months after surgery is 43%, while the incidence of late PVE (beyond 12 months after surgery) is 57% [6]. The aortic valve is subject of PVE in 66.5%, the mitral valve in 40.7%, the tricuspid valve in 2.9% of cases, and PVE involving more than one valve occurs in 7.2% of patients [8]. The most common underlying infectious organism is *Staphylococcus aureus*. In the present case

blood cultures and cultures of the extracted valve were negative. Diagnostic imaging of prosthetic valve endocarditis is a difficult task [9]. In general, the most informative method is TEE, which allows imaging of vegetations, abscesses or fistulas, leaflet mobility and ring stability. The sensitivity of TEE in the diagnosis of PVE ranges from 82% to 96%, in contrast to TTE carrying a sensitivity of only 17% to 36% [10]. However, in our clinical case, bedside TTE gave the clue (video 1), and indicated emergent surgery [11]. A quick review of the previous TTE on file in the hospital (video 2) enabled the diagnosis of a new wall motion abnormality in the distal interventricular septum and the left ventricular apex, different from the specific wall motion abnormality of Takotsubo syndrome. TEE was done acutely in the cath lab, showing the dehiscent valve ring (video 3) and turbulent flow around the valve.

### Follow-up

The postoperative course was uneventful. The patient was discharged from the hospital on Dalbavancin 1,5 g once per week because of an allergy to penicillin, and was followed up closely, with no more events. The patient has completely recovered as of the last follow-up visit in June 2023.

### Conclusion

Optimal management of PVE is still controversial. Emergency surgery may be necessary to prevent acute pulmonary edema and cardiogenic shock [4]. The cornerstone of surgical treatment of patients with PVE is the implantation of a new valve in a completely debrided site. In our case, the patient was diagnosed with an aortic root abscess with valve ring detachment, presenting clinically as ACS, and echocardiographically as rocking valve. The exact pathomechanism of myocardial injury during PVE is unclear and may include mechanical coronary compression and septic embolism into the coronary circulation [12].

### Declarations

**Ethics approval and consent:** not applicable.

**Consent for publication:** Written informed consent was obtained from the participant for the publication of his information

**Availability of data and materials:** Data of this case report are available upon request by contacting the corresponding author Irene Lang at irene.lang@meduniwien.ac.at

**Competing interests:** Authors have nothing to disclose.

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**Authors' contributions:** IML and UG managed and consented the patient, AK participated in the multidisciplinary team discussion, performed the surgery and provided the images of the explanted valve.

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### References

1. Thygesen K, Alpert J. S, Jaffe A. S, Chaitman B. R, Bax J. J, et al (2019) Fourth universal definition of myocardial infarction (2018). *Eur Heart J*, 40: 237-269.
2. Collet J. P, Thiele H, Barbato E, Barthélémy O, Bauersachs J, et al (2021) 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *Eur Heart J*, 42: 1289-1367.
3. Cecchi E, Parrini I, Chinaglia A, Pomari F, Brusasco G, et al (1997) New diagnostic criteria for infective endocarditis. A study of sensitivity and specificity. *Eur Heart J*, 18: 1149-56.
4. Habib G, Lancellotti P, Antunes M. J, Bongiorni M. G, Casalta J. P, et al (2015) 2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC). Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM). *Eur Heart J*, 36, 3075-3128.
5. Nataloni, M, Pergolini, M, Rescigno, G. & Mocchegiani, R. (2010) Prosthetic valve endocarditis. *J Cardiovasc Med (Hagerstown)*, 11: 869-83.
6. Bayer AS & Chambers HF (2021) Prosthetic Valve Endocarditis Diagnosis and Management- New Paradigm Shift Narratives. *Clin Infect Dis*, 72: 1687-1692.
7. Østergaard, L, Valeur, N, Ihlemann, N, Smerup, M. H, Bundgaard, H, et al (2018) Incidence And Factors Associated With Infective Endocarditis In Patients Undergoing Left-Sided Heart Valve Replacement. *Eur Heart J*, 39: 2668-2675.
8. Luciani, N, Mossuto, E, Ricci, D, Luciani, M, Russo, M, et al (2017) Prosthetic valve endocarditis: predictors of early outcome of surgical therapy. A multicentric study. *Eur J Cardiothorac Surg*, 52: 768-774.
9. Gomes A, Glaudemans A, Touw DJ, Van Melle JP, Willems TP, et al (2017) Diagnostic value of imaging in infective endocarditis: a systematic review. *Lancet Infect Dis*, 17: e1-e14.
10. Bruun NE, Habib G, Thuny F & Sogaard P (2014) Cardiac imaging in infectious endocarditis. *Eur Heart J*, 35:624-32.
11. Habib G, Erba PA, Iung B, Donal E, Cosyns B, et al (2019) Clinical presentation, aetiology and outcome of infective endocarditis. Results of the ESC-EORP EURO-ENDO (European infective endocarditis) registry: a prospective cohort study. *Eur Heart J*, 40:3222-3232.
12. Nazir S, Elgin E, Loynd R, Zaman M & Donato A (2019) ST-Elevation Myocardial Infarction Associated With Infective Endocarditis. *Am J Cardiol*, 123:1239-1243.