

## Not such a benign entity. Cardiogenic shock and mechanical complication in a patient with working diagnosis of myocardial infarction with no obstructive coronary arteries

Jagoda Młynarczyk<sup>1</sup>, Rafał Wyderka<sup>1</sup>, Maria Łoboz-Rudnicka<sup>1</sup>, Barbara Rzyckowska<sup>1</sup>, Barbara Brzezińska<sup>1</sup>, Krzysztof Namięta<sup>2</sup>, Jacek Skiba<sup>2</sup>, Marek Gemel<sup>2</sup>, Joanna Jarocho<sup>1,3</sup>

<sup>1</sup>Department of Cardiology, T Marciniak Lower Silesian Specialist Hospital — Emergency Medicine Center, Wrocław, Poland

<sup>2</sup>Department of Cardiac Surgery, 4<sup>th</sup> Military Teaching Hospital, Wrocław, Poland

<sup>3</sup>Faculty of Health Sciences, Wrocław Medical University, Wrocław, Poland

### Correspondence to:

Jagoda Młynarczyk, MD,  
Department of Cardiology,  
T Marciniak Lower Silesian  
Specialist Hospital  
— Emergency Medicine Center,  
Fieldorfa 2,  
54-049 Wrocław, Poland,  
phone: + 48 713 064 702,  
e-mail: jpatkaster@gmail.com,  
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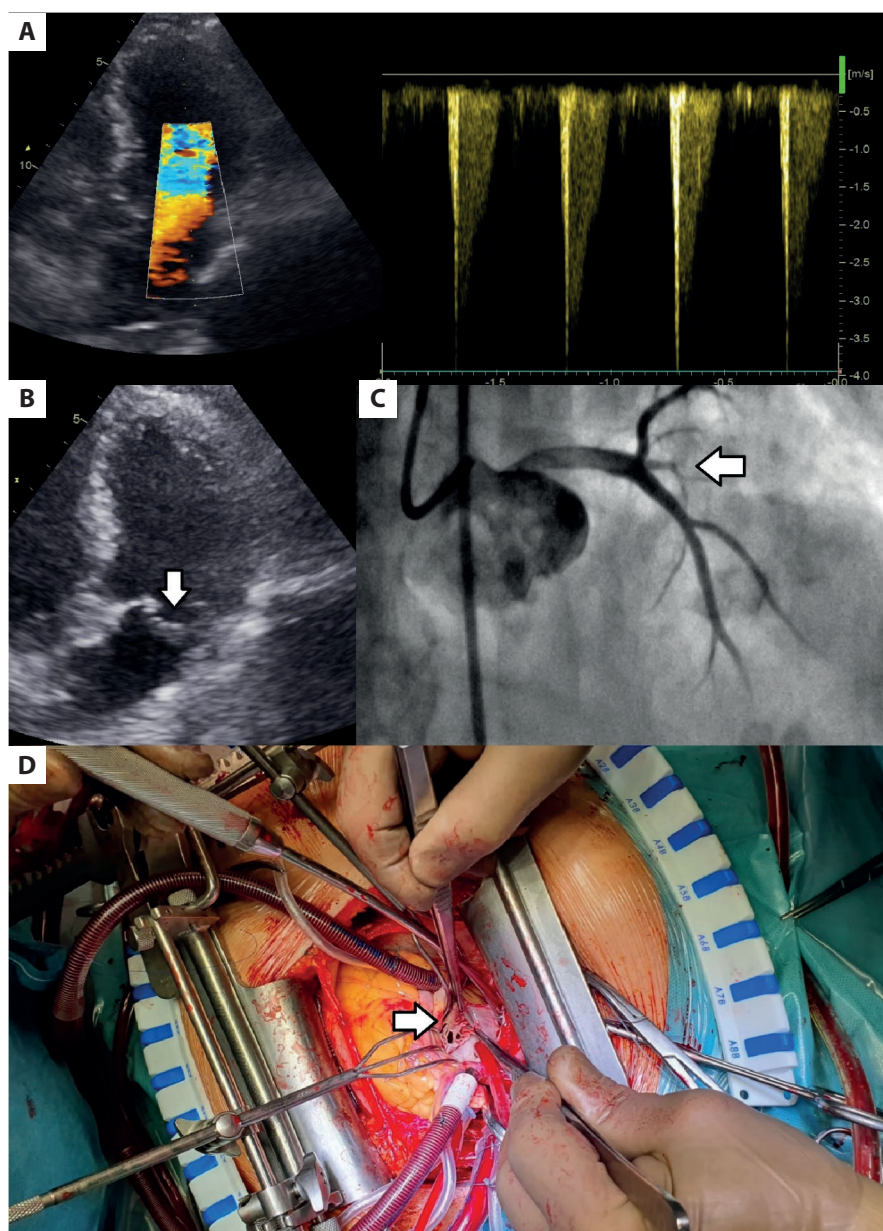
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An 82-year-old woman with a history of an ischemic stroke was admitted to the hospital with ST-segment elevation myocardial infarction complicated by pulmonary edema and cardiogenic shock (resistant to pharmacotherapy). Electrocardiography showed ST-segment elevation in the lateral leads and reciprocal denivelation in the inferior leads. Urgent coronary angiography demonstrated no significant coronary artery disease. Therefore, a working diagnosis of myocardial infarction with no obstructive coronary arteries (MINOCA) was made. Transthoracic echocardiography showed preserved left ventricular ejection fraction, akinesis of mid-lateral and mid-inferolateral segments of the left ventricle, severe acute mitral regurgitation (MR) due to flail leaflets and rupture of the head of the anterolateral papillary muscle (Figure 1A, B). This dramatic clinical manifestation prompted careful revision of coronary angiography images that disclosed proximal amputation of regressive ramus intermedius (because of the diameter of less than 1 mm a conservative approach was applied) (Figure 1C). Therefore, the ramus intermedius was assumed as an infarct-related artery (IRA).

The patient was urgently transferred to the cardiac surgery department. Intraoperative findings demonstrated almost total detachment of both mitral leaflets (Figure 1D); the patient underwent mechanical mitral valve replacement. Due to persistent severe circulatory and respiratory failure, the patient was hospitalized in the intensive care unit for nearly 3 months and unfortunately died of sepsis.

The diagnosis of MINOCA should be sequential, with careful assessment of the clinical context and exclusion of non-ischemic myocardial damage. Due to the heterogeneity of MINOCA patients, the diagnostic algorithm should be omnidirectional and include intracoronary imaging (intravascular ultrasound imaging, optical coherence tomography), cardiac magnetic resonance (CMR), and even intracoronary provocation tests in the investigation of coronary spasm and microvascular disease. However, before using advanced diagnostic tools (often invasive), it is recommended to re-review the angiographic images to detect overlooked obstructive coronary artery disease (CAD) [1]. In this case, the IRA was a small branch, but it supplied the crucial region of the myocardium. Acute ischemic MR resulting from papillary muscle head rupture is a life-threatening condition. The major treatment strategy is a surgical correction (mitral valve repair or valve replacement), characterized by high operative mortality (15.1% in comparison to 1.5% in chronic MR) [2].

Despite the data on better prognosis for patients with MINOCA compared to patients with myocardial infarction with obstructive coronary artery disease (MI-CAD), clinical presentation of MINOCA can be severe. In-hospital mortality in MINOCA patients amounts to 0.9%–1.1%, and 12-month mortality to 4.7%, which is even more worrying [3]. Therefore, patients with MINOCA require the same careful diagnostic and therapeutic approach as patients with MI-CAD.



**Figure 1.** **A.** Four-chamber view transthoracic echocardiography: Doppler spectrum of acute severe mitral regurgitation. **B.** Four-chamber view transthoracic echocardiography: no coaptation because of flail leaflet (arrow). **C.** Proximal amputation of regressive ramus intermedius (arrow) found during revision of coronary angiography. **D.** Intraoperative image of the detached anterior mitral leaflet (arrow)

### Article information

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