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Case Report

Delayed recognition of myocardial infarction due to Herpes zoster and ventricular septal rupture as a complication: The impact of atypical presentations

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ABSTRACT

Myocardial infarction is a leading cause of mortality worldwide, with chest pain being the hallmark symptom. However, atypical presentations can delay diagnosis and treatment, increasing the risk of complications. Herpes zoster, commonly known as shingles, typically presents with dermatomal pain, which can overlap with angina, leading to misdiagnosis. In this case report, a 67-year-old female with no prior comorbidities was diagnosed with Herpes zoster one week before presenting to the emergency department with persistent chest discomfort, weakness, and palpitations is presented.

Keywords: Acute myocardial infarction, atypical presentation of MI, Herpes zoster, mechanical complication of MI, ventricular septal rupture.

Cardiovascular diseases are the most common cause of mortality worldwide. Chest pain is the characteristic symptom of coronary artery disease. However, the differential diagnosis is a wide spectrum, including cardiac, pulmonary, gastrointestinal, and musculoskeletal etiologies, as well as miscellaneous causes like *Herpes zoster* (shingles), as shown in Table 1. Thoracic dermatomal pain of shingles may overlap with angina and lead to diagnostic delays. The incidence of mechanical complications following myocardial infarction (MI), such as ventricular septal rupture (VSR), has declined with high-sensitivity troponins, improvement in healthcare systems, and progress in primary percutaneous coronary intervention (PCI) techniques. Ventricular septal rupture still occurs in approximately 0.21% of patients with ST-elevation myocardial infarction (STEMI).[1] Atypical presentations and co-presentation, as like *Herpes zoster*, can complicate the diagnosis of MI, resulting in delayed treatment and increased risk of life-threatening outcomes.

This case report describes a patient with a delayed diagnosis of anterior MI complicated by VSR due to the concurrent presentation of shingles.

CASE REPORT

A 67-year-old female presented to the emergency department (ER) with complaints of chest discomfort, back pain, weakness, and palpitations. She had no known chronic disease or medications. Her significant risk factors included heavy smoking and a family history of premature MI, with her mother and sister in their 50s. Informed consent was obtained from the daughter of the patient. Written informed consents were obtained from the patients.

The patient was initially diagnosed with *Herpes zoster* in outpatient clinic one week ago. The symptoms persisted despite a week of oral acyclovir therapy. The patient was referred to the ER due to intensified palpitations

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Table 1. Differential diagnosis of chest pain

Cardiac	Pulmonary	Gastrointestinal	Musculoskeletal	Miscellaneous
Acute coronary syndromes	Pneumothorax	Boerhaave syndrome	Costochondritis	Severe anemia
Aortic dissection	Pleuritis	Gastroesophageal reflux disease	Rib fracture	*Herpes zoster*
Myocarditis/pericarditis	Pulmonary embolism	Esophagitis		Acute chest syndrome in sickle cell anemia
Aortic stenosis	Lung cancer	Peptic ulcer		Panic attack
Other	Other	Other		

over the last two days. On presentation, blood pressure was 90/55 mmHg, heart rate was 110 bpm, and oxygen saturation was 98%. An electrocardiogram (ECG) revealed acute anterior MI, as shown in Figure 1.

Oscultation of the heart and lungs did not reveal any murmurs, rales, or rhonchi. Transthoracic echocardiography (TTE) demonstrated severe hypokinesis of all apical segment, septal mid-segment, and anterior mid-segments with a left ventricular ejection fraction of 30% without significant valvular abnormalities.

The patient was immediately taken to the coronary angiography laboratory for primary PCI. Coronary angiography revealed total occlusion of the left anterior descending artery, subtotal stenosis of the circumflex artery, and a non-dominant right coronary artery. No distal flow was achieved despite multiple attempts at revascularization. The patient subsequently developed cardiogenic shock during the procedure, requiring the intensive care team's support and repeat TTE, which revealed apical and septal ballooning with a 17 mm VSR, as shown in Figure 2.

Unfortunately, the patient suffered a cardiac arrest and did not respond to resuscitative efforts. Surgical intervention could not be planned.

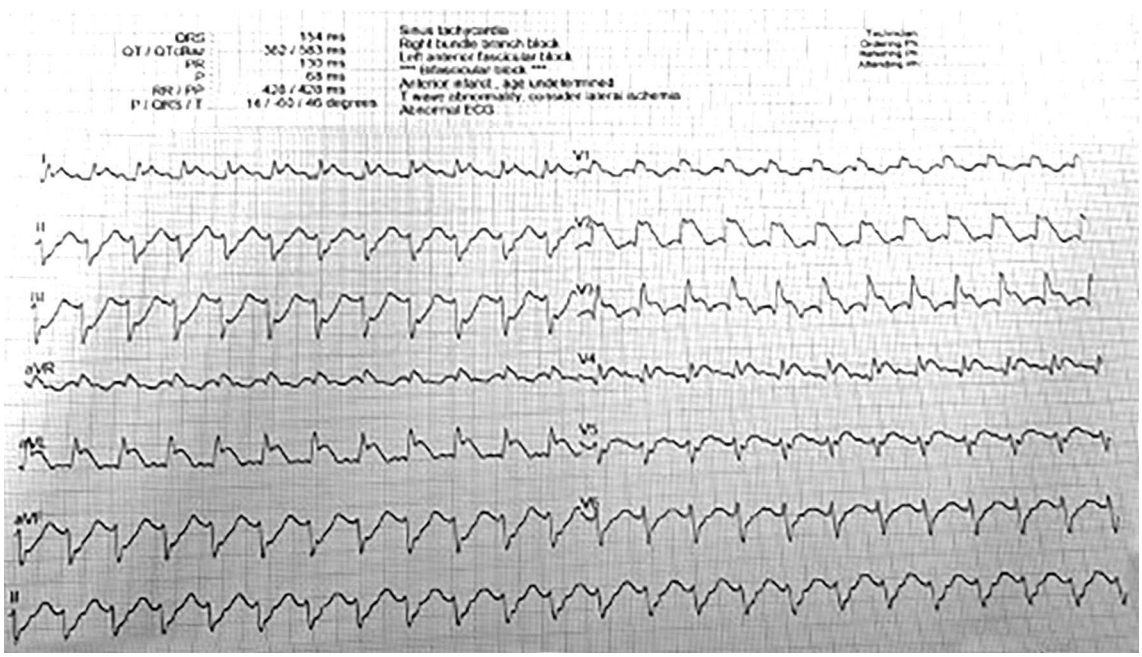

Figure 1. The patient's electrocardiogram on admission.

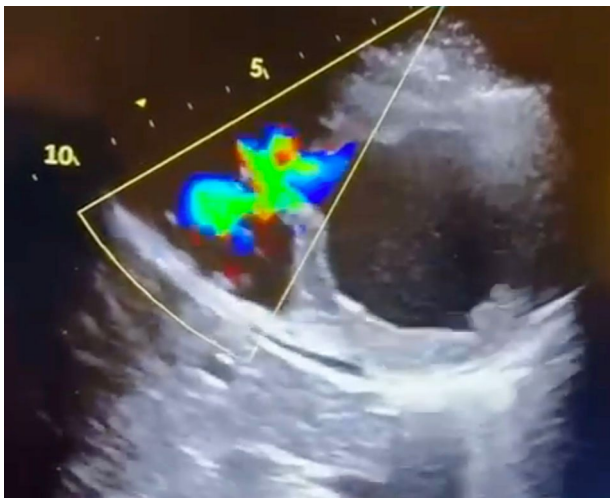

Figure 2. Transthoracic echocardiography imaging during percutaneous coronary intervention.

DISCUSSION

Chest discomfort is the hallmark symptom of MI. In patients with significant cardiovascular risk factors such as advanced age, smoking, and a family history of heart disease, chest pain should never be ignored. *Herpes zoster* typically emerges with a painful vesicular rash in a single dermatome. Its overlap with MI symptoms can be challenging to recognize MI. According to the most wide-spectrum meta-analysis about this condition have demonstrated one in five individuals with latent varicella-zoster virus (VZV) experiences reactivation, commonly as *Herpes zoster*.[2] Following *Herpes zoster*, especially in the first three months, a significant increase in the risk of MI has been reported.[3]

The association between *Herpes zoster* and MI might be incidental. Additionally, there are several mechanisms to explain this relationship. The migration of VZV to coronary vessels may lead to local inflammation and subsequent coronary artery occlusion.[4] Moreover, the inflammatory and autoimmune responses to *Herpes zoster* may trigger coronary plaque instability and rupture.[5] Common precipitating factors, including stress and immunosuppression, could trigger both *Herpes zoster* and MI.[6] This phenomenon is named as VZV vasculopathy by some authors and is associated with a 31% increased risk of cerebrovascular events after or during *Herpes zoster*.[7] Clinicians should be aware of the possibility of concurrent acute coronary syndromes in patients with *Herpes zoster* and ensure that cardiac evaluation is included in the diagnostic workup. Acute coronary syndromes should clearly be excluded before treatment particularly in patients who have significant cardiovascular risk factors.

Acute pulmonary edema, arrhythmias, and mechanical complications like VSR are the catastrophic complications of STEMI. The presence of heart murmurs, abnormal lung sounds, and peripheral pulse abnormalities should be noted carefully since they could be used as diagnostic clues. For early recognition of complications and guiding management, continuous cardiac monitoring by bedside TTE is a valuable tool. This case emphasizes the importance of a complete cardiovascular examination, including auscultation and bedside TTE, in all patients presenting with chest pain, regardless of the etiology.

In conclusion, maintaining a high index of suspicion of MI has vital importance in patients presenting with chest pain, even when confounding factors like *Herpes zoster* are present. The delayed diagnosis in this case highlights the potential for severe complications, such as rarely seen VSR, when MI is not promptly recognized. This relationship is valuable for clinicians since shingles is both in the differential diagnosis of angina pectoris and preventable through vaccination. Public health initiatives should advocate for *Herpes zoster* vaccination, particularly in individuals over the age of 50, to potentially reduce the incidence of VZV-related complications, including cardiovascular events.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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