



Case Report

Anterior wall ventricular pseudoaneurysm presenting as dizziness and syncope

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ABSTRACT

Ventricular pseudoaneurysm rupture is a rare finding in emergency departments in the era of percutaneous coronary intervention. It is an infrequent complication after acute myocardial infarction. We present a case of ventricular pseudoaneurysm rupture and examine current literature on the pathophysiology and imaging guidelines on the topic. The patient is a 58-year-old male that presented to the emergency department with dizziness and syncope. Imaging in the emergency department included computed tomography of the chest and an ultrasound that showed pseudoaneurysm with hemopericardium and early cardiac tamponade. He was treated surgically. Ventricular pseudoaneurysm rupture is an uncommon finding in medicine and the emergency department. Point-of-care ultrasound is an important diagnostic modality to identify this critical complication and prompt surgical management.

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1. Introduction

Ventricular pseudoaneurysm rupture is a rare but a life-threatening condition. Current understanding of the pathophysiology of this disease suggests that most patients have a predisposing myocardial infarction (MI). A pseudoaneurysm forms when a ventricular free wall rupture is contained by adhering pericardium [1]. We present a case of pseudoaneurysm rupture presenting to the emergency department shortly after the development of syncope and review the current pathophysiology and the literature on this topic.

2. Case report

A 58-year-old male with a history of myocardial infarction one year prior to this event presented to the emergency department following a syncopal episode. He was afebrile, heart rate was 120 bpm, blood pressure was 134/91 mmHg, and SpO₂ of 97% on room air. His physical exam was notable for jugular venous distention and an S3 gallop on auscultation. ECG showed low voltage. Basic lab work was unremarkable, and a CT angiogram of the chest was obtained (Fig. 1). The patient was transferred to our institution for further management.

Transthoracic echocardiogram (TTE) and CT of the chest demonstrated an anteroapical ventricular pseudoaneurysm with hemopericardium, secondary to post-MI changes (Figs. 1, 2, and

Fig. 3). The patient was rapidly evaluated by cardiology and cardiothoracic surgery and was admitted to the cardiovascular intensive care unit. The patient underwent ventricular pseudoaneurysm repair on hospital day five and recovered well. He was discharged from the inpatient unit.

3. Discussion

Unlike true aneurysms, which are commonly seen in anterior MI, anterior pseudoaneurysms are rare and account for only 18% of pseudoaneurysms [2,3]. Clinicians must be able to appropriately discern pseudoaneurysm from true aneurysm due to the increased mortality associated with pseudoaneurysm as well as the differences in management. Ventricular pseudoaneurysm is formed after ventricular free wall rupture, which is contained by adherent pericardium [1]. Whereas, true aneurysms are a result of bulging of akinetic or dyskinetic myocardium. Mortality for true aneurysm varies greatly depending on time of development after the MI, ranging from 80% if developed within five days of the MI to 25% if developed within one year of the MI [2]. Morbidity and mortality from true aneurysms is secondary to development of congestive heart failure, embolic events and ventricular arrhythmias [4]. Ventricular pseudoaneurysms are highly susceptible to rupture and have high mortality secondary to rapid development of cardiogenic shock with rupture of the pseudoaneurysm [5]. Prompt reversal of tamponade and repair of pseudoaneurysm are required in the setting of cardiogenic shock. Unlike pseudoaneurysms, which require prompt surgical intervention, true aneurysms can often be managed medically.

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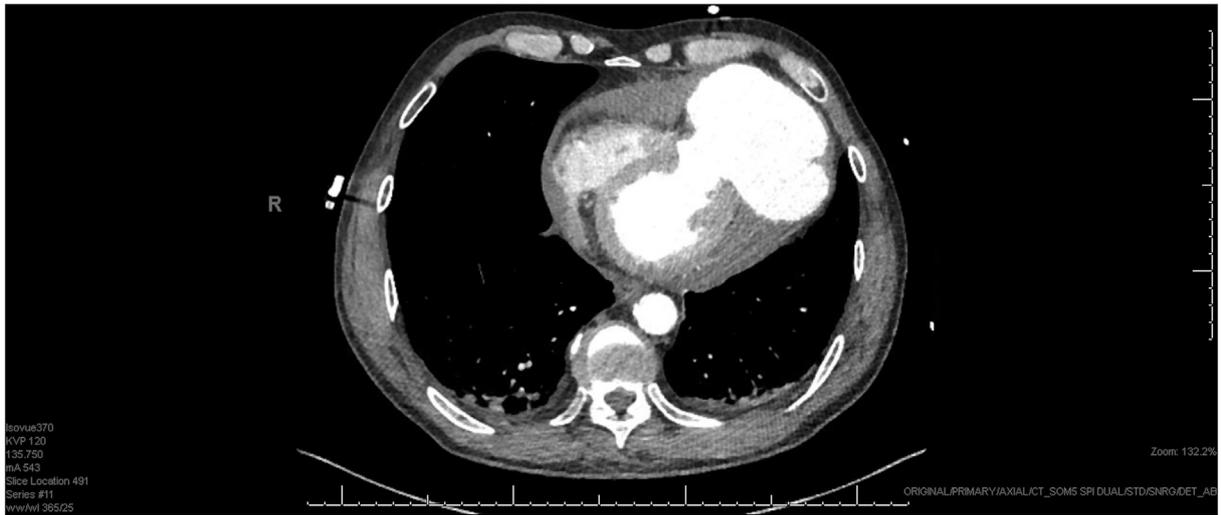


Fig. 1. CT angiogram of the chest showing large anterior pseudoaneurysm with moderate hemopericardium without evidence of active extravasation.

The incidence of anterior pseudoaneurysm is likely underestimated in the literature as this disease process results in rapid development of hemopericardium, cardiac tamponade, cardiogenic shock, and death [1]. Because of its high mortality, it is important to consider pseudoaneurysm in your differential diagnosis when a patient reports dizziness and syncope within a few years of MI.

ECG and chest radiograph abnormalities are present in up to 95% of patients with ventricular pseudoaneurysms, and most commonly demonstrate cardiomegaly and non-specific ST segment and T wave abnormalities [1,3]. These findings are non-specific and do not contribute substantially to the diagnosis of pseudoaneurysm. However, multi-modal imaging, including TTE, cardiac CT, and cardiac MRI, all contribute to the diagnosis [6]. TTE is an excellent modality since it will identify ventricular wall abnormalities, shunt, and tamponade physiology at the bedside. At this time, there is not sufficient evidence to

demonstrate that TTE alone is able to differentiate pseudoaneurysm from true aneurysm, but TTE is the preferred modality to demonstrate shunt and tamponade physiology [1]. Cardiac CT and cardiac MRI are the preferred modalities for distinguishing pseudoaneurysm from true aneurysm as these imaging modalities provide better spatial resolution and tissue definition in differentiating myocardium from adherent pericardium [1].

4. Conclusion

Ventricular pseudoaneurysm is a rare but important complication after anterior wall MI. The condition is rare with the widely available percutaneous coronary intervention, but it remains crucial for emergency medicine providers to recognize. Diagnosis of this disease process requires multiple imaging modalities. Point of care TTE is a crucial part

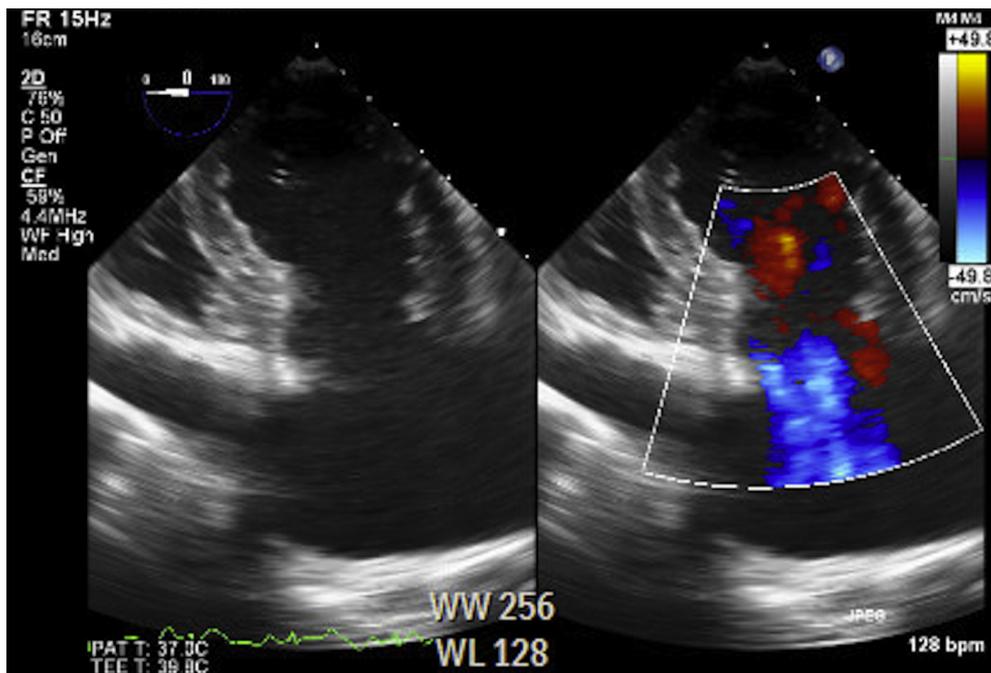


Fig. 2. Parasternal short axis view showing a large anterior ventricular pseudoaneurysm, without thrombus, and moderate pericardial effusion (left panel). Identical image in Doppler mode with freely moving bidirectional flow (right panel).

of the initial evaluation, as these patients likely will have non-specific findings on routine evaluations, including ECG and chest radiographs. Point of care TTE is also used to identify hemopericardium and tamponade, which are associated with increased mortality and require prompt surgical evaluation by cardiothoracic surgery. Cardiac CT and cardiac MRI are often necessary imaging modalities to differentiate between true aneurysm and pseudoaneurysm.

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Meetings

None.

Grants

No grants or other financial resources were utilized for this case.

Conflicts of Interest

None of the authors listed above have any conflicts of interest to disclose.

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