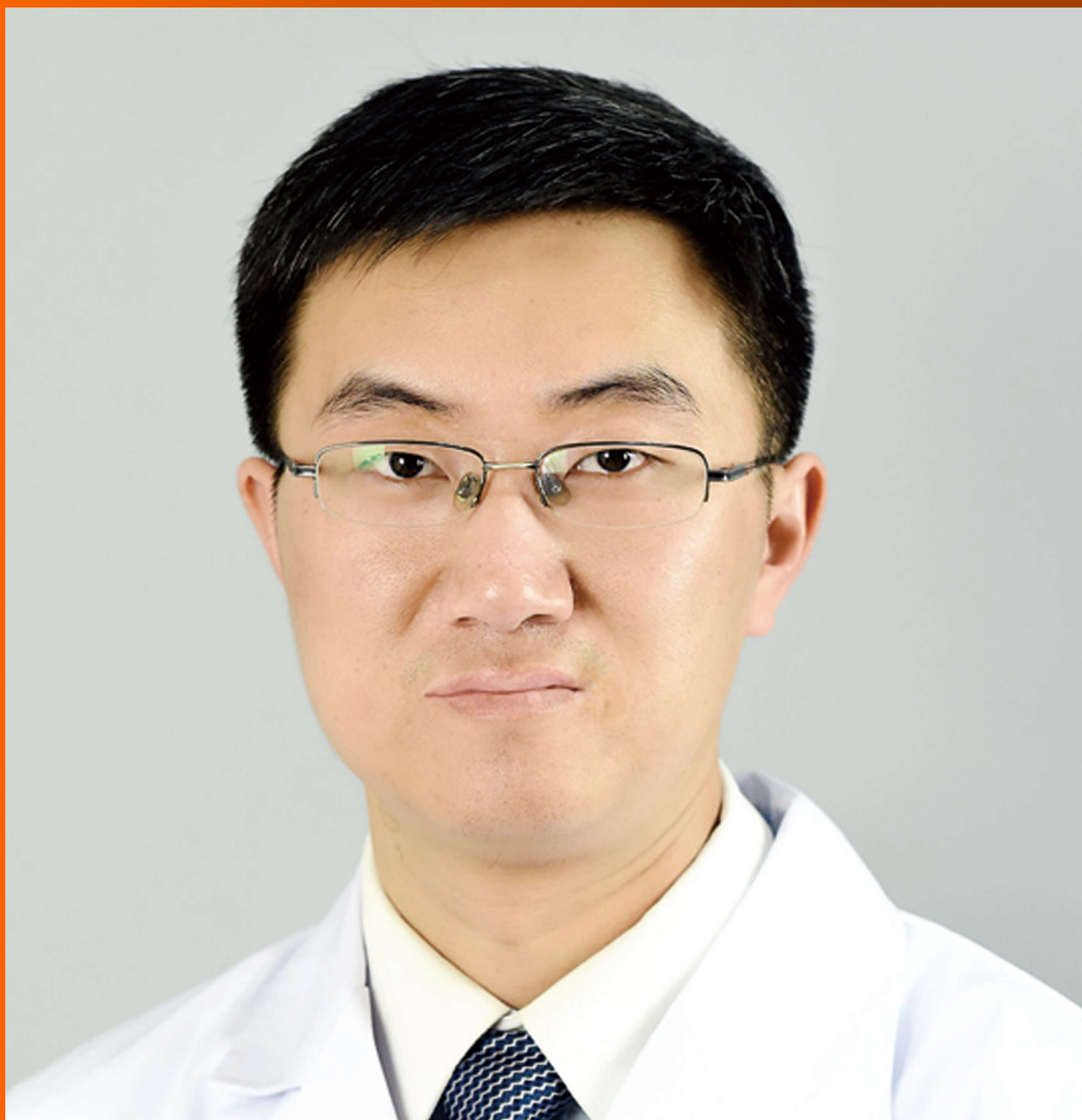


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Posterobasal left ventricular aneurysm after myocardial infarction with normal coronary arteries: Case-report

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Author contributions: Kalinin RE and Suchkov IA designed the report; Mzhavanadze ND and Ncheye AF collected the patient's clinical data; Suchkov IA, Mzhavanadze ND and Ncheye AF analyzed the data and wrote the paper.

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Abstract

We present a case of a 64-year-old woman with signs of debilitating condition including anginal chest pain, exertional dyspnea, and depression. The patient had previously suffered from a myocardial infarction after a loss of a close family member. Workup showed a posterobasal left ventricular aneurysm and moderate to severe mitral regurgitation in the absence of coronary atherosclerosis. Routine ultrasonography revealed abdominal aortic aneurysm and intraabdominal aortic deviation. The patient was immediately started on optimal medical treatment. On repeat assessment general condition was satisfactory, vital signs were normal, and investigations showed no signs of progressive heart failure or other significant clinical changes. Although prognosis in patients with myocardial infarction with normal coronary arteries is generally considered favorable, mechanical complications such as posterobasal left ventricular aneurysm with moderate to severe mitral regurgitation are possible.

Key words: Myocardial infarction; Posterobasal aneurysm; Abdominal aortic aneurysm

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Core tip: Patients with myocardial infarction with normal coronary arteries may develop mechanical complications such as posterobasal left ventricular aneurysm with moderate to severe mitral regurgitation.

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INTRODUCTION

The prevalence of myocardial infarction with normal coronary arteries (MINCA) is heterogeneous and may vary from 1% to 12% of all myocardial infarctions (MI)^[1]. A study conducted by Cortell *et al*^[2] in 2009 showed that up to 13% of the patients with non-ST segment elevation myocardial infarction (NSTEMI) had no significant coronary atherosclerosis on angiography.

Early descriptions of MINCA made by Raymond R. *et al.* in 1988 included symptoms and electrocardiographic presentation similar to those in patients with coronary artery disease (CAD) with smaller areas of myocardial necrosis^[3]. Later in 1998 Khan *et al*^[4] published an article on MINCA in pre-menopausal females, which declared any absence of conventional CAD factors, history of ischemic pain or previous myocardial infarction.

Although MINCA is regarded as a cardiological "enigma" with no definitive risk factors or potential pathophysiological pathways, certain features may be attributed to this condition^[5]. Chandrasekaran *et al*^[6] in 2002 proposed that coronary angiospasm, intracoronary thrombosis or embolization from a distal source with spontaneous lysis, substance abuse, viral myocarditis, aortic dissection, hypercoagulable states, autoimmune vasculitis, and carbon monoxide poisoning may possibly attribute to the development of MINCA. Cortell *et al*^[2] in 2009 noted that rather young non-diabetic females with prior antiplatelet treatment who presented with NSTEMI had normal coronary angiograms. Daniel *et al*^[1], 2016 mention higher prevalence of smoking, inflammatory disease, impaired glucose metabolism, and mental disorders among MINCA patients. Moreover, these authors found that female patients recalled emotional stress before admission, which together with psychiatric vulnerability indicated an acute stress-induced cardiomyopathy (Takotsubo syndrome) as an important cause of such condition^[7]. Arnold *et al*^[8], 2012 mention that both moderate and high levels of stress in patients with acute myocardial infarction were associated with worse long-term prognosis even after adjustment for such parameters as sociodemographics, clinical factors, depressive symptoms, revascularization status, and Global Registry of Acute Coronary Events discharge risk

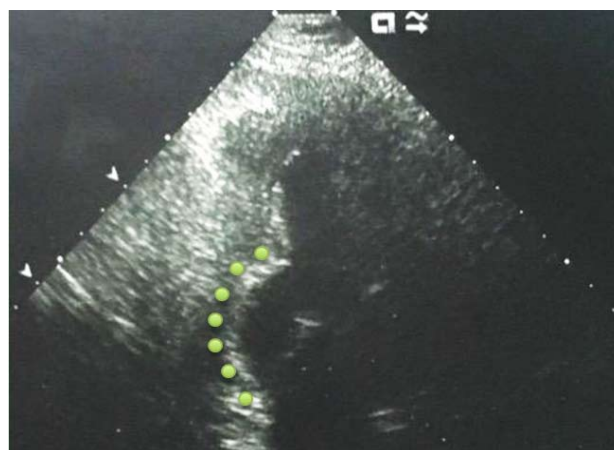


Figure 1 Transthoracic echocardiography showing posterobasal left ventricular aneurysm on apical two-chamber view.

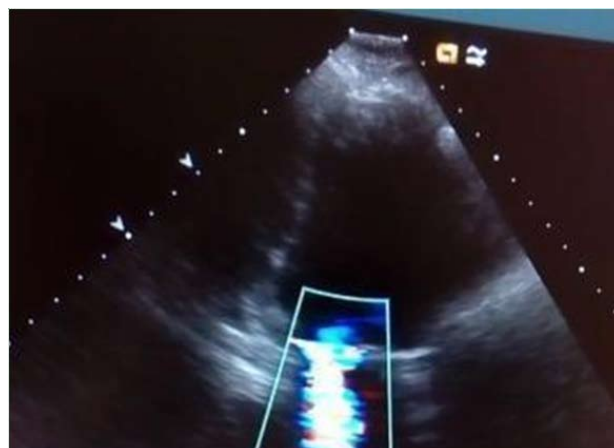


Figure 2 Transthoracic echocardiography showing mitral valve regurgitation jet on apical two-chamber view.

scores.

We present a case of a female patient with MINCA who developed a posterobasal left ventricular aneurysm with moderate to severe mitral regurgitation.

CASE REPORT

A 64-year-old woman presented with angina-like chest pain, exertional dyspnea, and anxiety at a local hospital in March 2017. The subject had a history of a NSTEMI with elevated troponin level in 2013 after a loss of a close family member several days prior to admission; the subject received conservative treatment, no reperfusion or revascularization were performed.

A physical examination in 2017 showed that the patient was oriented to people, place, time, and situation, with signs of anxiety. Blood pressure was 140/80 mmHg on antihypertensive drugs, pulse rate 74 beats per minute, regular, respiratory rate 18, temperature 36.6 °C. No history of cardiac disease or sudden cardiac death in the family. The patient was previously diagnosed with depression and received irregular treatment with

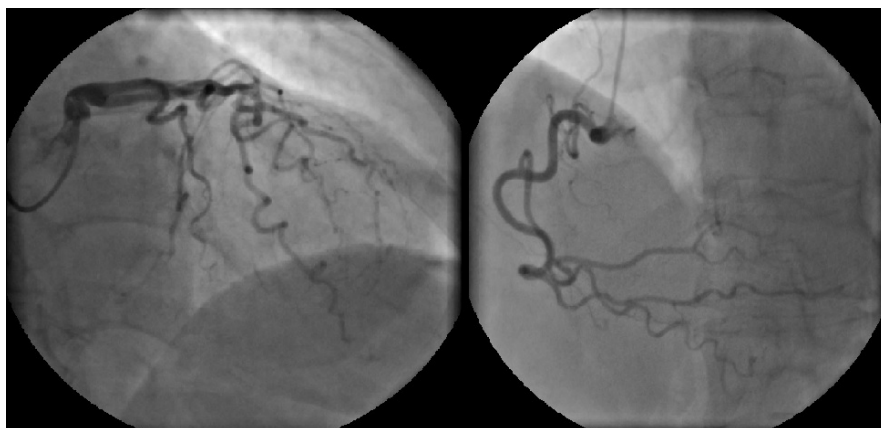


Figure 3 Coronary angiography with normal coronary arteries.

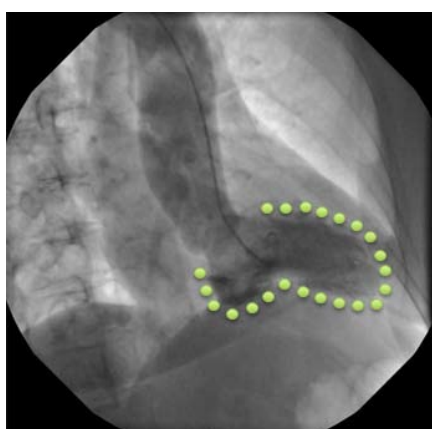


Figure 4 Left ventriculography demonstrating posterior wall bulging (systole) on the left.



Figure 5 Left ventriculography demonstrating posterior wall bulging (diastole) on the right.

sertraline. Laboratory investigations were essentially normal. Electrocardiogram (ECG) showed sinus rhythm with regular atrioventricular conduction. Transthoracic echocardiography showed dyskinesia and posterobasal left ventricular (LV) wall bulging 32 mm × 16 mm (Figure 1). Other findings included dilatation of ascending aorta (41 mm), LV dysfunction with ejection fraction 47%

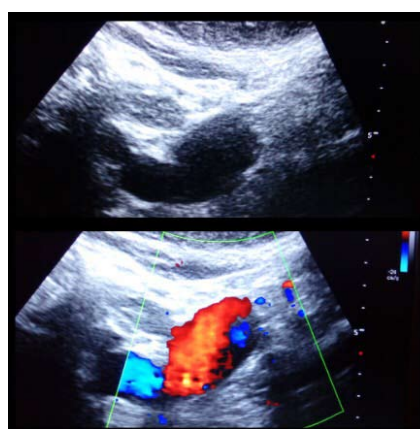


Figure 6 Infrarenal abdominal aneurysm with maximum diameter of 31 mm found incidentally on abdominal ultrasonography.

and moderate to severe mitral regurgitation (Figure 2). The patient continued to receive aspirin 75 mg QD, rosuvastatin 10 mg QD, amlodipine 5 mg, lisinopril 10 mg QD, and was started on bisoprolol 2.5 mg BID, indapamide 1.5 mg QD, eplerenone 25 mg QD.

Upon receiving her consent, the patient was admitted to a cardiovascular surgery department. General condition was satisfactory: The patient was oriented, with no new complaints; vital signs were normal. The subject had fewer episodes of chest pain, which were mostly associated with anxiety; dyspnea episodes were less frequent and intense. Repeat ECG and echocardiography gave the same results as previous tests. Coronary angiography (Figure 3) revealed no significant organic changes; ventriculography (Figures 4 and 5) demonstrated posterior LV wall bulging. An asymptomatic infrarenal abdominal aneurysm with maximum diameter of 31 mm and deviation of aorta were incidentally found on routine abdominal ultrasonography (Figure 6).

As of January 2018 the patient did not consider any surgical interventions among treatment options and continued to receive conservative treatment under the supervision of both cardiologist and psychiatrist.

DISCUSSION

Exact rates of post-myocardial complications in patients with normal coronary arteries are not known. Initial reports showed that in general the incidence of malignant arrhythmias, heart failure, and hypotension in MINCA patients were rather low and the long-term prognosis was more favourable as compared to patients with CAD^[3]. Cortell *et al.*^[2] also state that the overall prognosis for such cohort of patients was considered good. However, some authors mention life-threatening mechanical MINCA complications including subepicardial aneurysm associated with ventricular septal perforation or ventricular septal rupture^[9,10].

In our case, myocardial infarction with normal coronary arteries has led to the development of a posterobasal left ventricular aneurysm with moderate to severe mitral regurgitation. Regardless of treatment modality, MINCA survivors require close monitoring in both acute phase and long-term period. Follow-up care should include imaging studies to evaluate the extent of disease progression as was done in our case. Possible concomitant conditions or complications should be addressed promptly.

ARTICLE HIGHLIGHTS

Case characteristics

Angina-like chest pain, exertional dyspnea, and anxiety.

Clinical diagnosis

Posterobasal left ventricular aneurysm and moderate to severe mitral regurgitation in the absence of coronary atherosclerosis.

Differential diagnosis

Differential diagnosis with coronary artery disease due to atherosclerosis. Angiography revealed no stenotic or occlusive lesions.

Imaging diagnosis

Electrocardiography, echocardiography, angiography, and duplex ultrasonography were used in this case.

Treatment

The patient received aspirin 75 mg QD, rosuvastatin 10 mg QD, amlodipine 5 mg, lisinopril 10 mg QD, and was started on bisoprolol 2.5 mg BID, indapamide 1.5 mg QD, eplerenone 25 mg QD.

Term explanation

MINCA: Myocardial infarction with normal coronary arteries.

Experiences and lessons

Myocardial infarction with normal coronary arteries may lead to the development of mechanical complications such as a posterobasal left ventricular aneurysm with moderate to severe mitral regurgitation, which requires close monitoring and follow-up care.

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