Repair of the giant left ventricular inferior wall aneurysm

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Abstract

Background. Ventricular aneurysms develop after transmural myocardial infarctions and can significantly worsen clinical outcomes. We report an unusual case of the giant inferior wall aneurysm, successfully treated by surgical resection. Case presentation. The 65-year-old male was diagnosed with a giant inferior wall left ventricular aneurysm after worsening of his dyspnoea. Four months prior to the admission, he had ST-elevation inferior myocardial infarction, complicated by pericarditis. During the 4-month follow-up period, the aneurysm has significantly increased in size. Unrecognized ventricular wall rupture was supposed. The precise anatomy of the aneurysm was established by cardiac MRI. Surgical resection of the aneurysm was performed with uneventful patient's recovery. Conclusion. Timely surgical treatment of the rapidly growing aneurysms is recommended. In such cases cardiac MRI can specify anatomy and coordinate surgical strategy.

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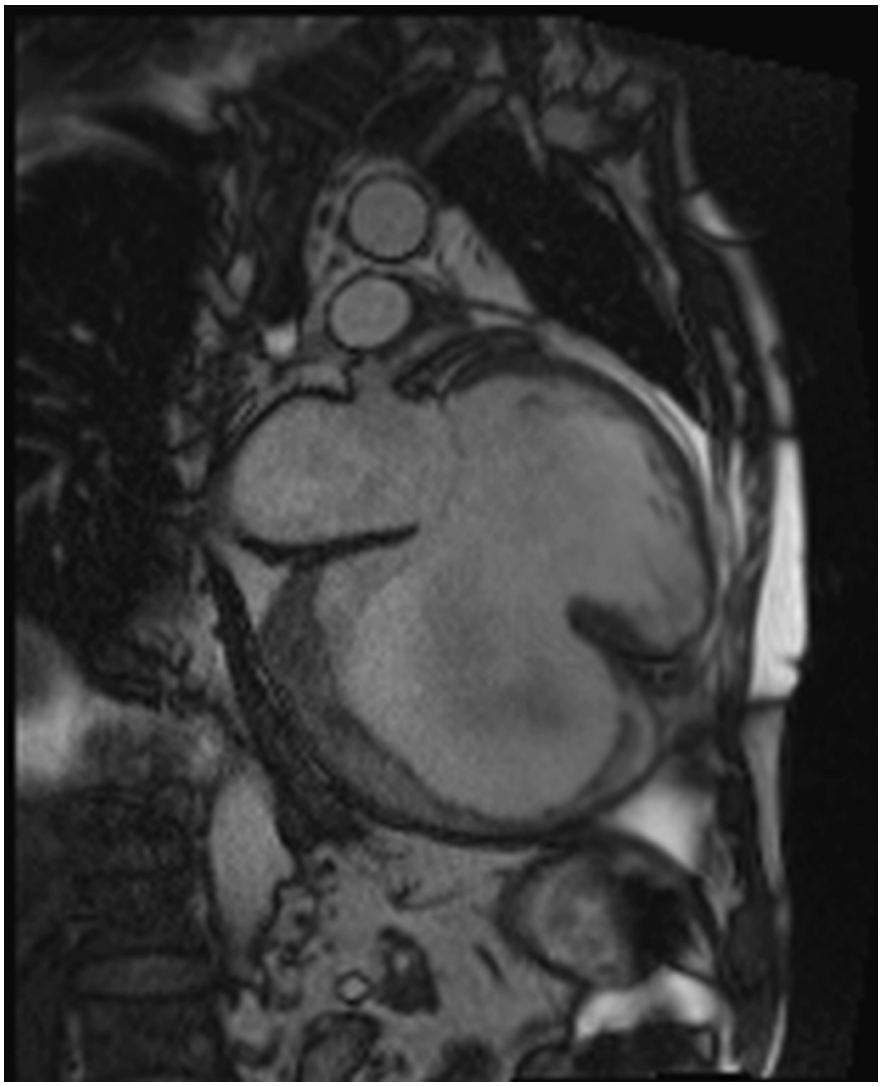
Central picture



Central picture legend. Contrast-enhanced MRI, demonstrating the giant left ventricular inferior wall aneurysm.

Central message

Inferior wall postinfarction aneurysms are found infrequently and can have unusual forms. Cardiac MRI should be done to guide surgical intervention.

Abstract

Background. Ventricular aneurysms develop after transmural myocardial infarctions and can significantly worsen clinical outcomes. We report an unusual case of the giant inferior wall aneurysm, successfully treated by surgical resection.

Case presentation. The 65-year-old male was diagnosed with a giant inferior wall left ventricular aneurysm after worsening of his dyspnoea. Four months prior to the admission, he had ST-elevation inferior myocardial infarction, complicated by pericarditis. During the 4-month follow-up period, the aneurysm has significantly increased in size. Unrecognized ventricular wall rupture was supposed. The precise anatomy of the aneurysm was established by cardiac MRI. Surgical resection of the aneurysm was performed with uneventful patient's recovery.

Conclusion. Timely surgical treatment of the rapidly growing aneurysms is recommended. In such cases cardiac MRI can specify anatomy and coordinate surgical strategy.

Background

Ventricular aneurysms occur after full-thickness myocardial infarctions (MI) in 30-35 %. They contribute to the development of systolic myocardial dysfunction thus reducing survival rates. Most aneurysms are true aneurysms and more typically occur at the apical part of the LV wall [1]. Basal aneurysms are usually false, their incidence is relatively rare and varies between 5 and 10% [1-3]. Timely surgical intervention upon diagnosis established is recommended, considering that inferior wall aneurysms have significant potential for rupture [4].

Case presentation

65-year-old patient admitted to the hospital with worsening fatigue and shortness of breath within last 3 weeks (chronic heart failure NYHA class III). He had an acute inferior ST-elevation myocardial infarction (MI) four months prior to the admission. Noteworthy, the patient refused angiography at the time of the initial presentation. The course of MI was complicated by the basal left ventricular (LV) aneurysm with the thrombus revealed on transthoracic echocardiography (TTE), followed by the pericardial effusion, which required pericardiocentesis.

At the current hospitalization, coronary angiography demonstrated multivessel disease with the right coronary artery occlusion and transesophageal echocardiography (TEE) revealed the giant inferior wall aneurysm (Figure 1, A). The aneurysm contained large thrombus and was surrounded by multiple pericardial adhesions, giving the suspicion of an unrecognized LV free wall rupture. Other echocardiography findings: LVEDV – 189 ml, LVEF (Simpson) – 32%, mild to moderate MR. For the sake of defining the precise LV anatomy, contrast-enhanced MRI scan was performed, which confirmed the destructed inferior LV wall, replaced with the giant aneurysm 10.5 cm length and 7.1 cm width (figure 1, B).

According to the available diagnostic findings, this patient was scheduled for the surgical treatment. Expeditious surgery was carried out: meticulous cardiolysis with aneurysm mobilization and resection, followed by the left ventricular reconstruction using elliptical bovine pericardial patch (figure 2). There was no distal target for the right coronary artery grafting, therefore single LITA-LAD graft was additionally performed. Patient's postoperative course was uneventful, postoperative TTE showed markedly reduced LVEDV (118 ml) and trace MR. The patient was discharged home on day 7 with substantial clinical improvement (NYHA class I). Two-month follow-up MRI scan is demonstrated on the figure 1, C.

Discussion

Inferior wall aneurysms are rare complications of transmural MI, often leading to severe systolic dysfunction and increased risk of death [4, 5]. There are two types of aneurysms: true aneurysms, which by definition have thin, solid, well demarcated, akinetic or dyskinetic fibrotic wall with no viable myocardium and false aneurysms, which have narrow connection with LV cavity, have interruptions within muscular layer on echocardiography and often covered with the thrombus. They often develop when the patient survives an episode of the ventricular free wall rupture [5].

It seems that in our case both mechanisms played a role. Upon MI entailed by the formation of the true basal aneurysm and pericarditis, dense adhesions surrounding the infarction area eventually developed. When gradual enlargement of the aneurysm led to the wall perforation, adhesive process prevented fatal cardiac tamponade, and let the patient survive this episode. Staged cardiac visualization with transthoracic echocardiography, cardiac MRI and intraoperative transesophageal echocardiography provided sufficient anatomic information and coordinated surgical strategy.

Conclusion

Basal aneurysms are rarely seen, frequently have odd anatomy and can be poorly visualized on routine echocardiography, thus cardiac MRI can be useful in the anatomical verification. Expeditious surgical treatment is recommended for preventing of the aneurysmal rupture and heart failure progression.

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Figure legends

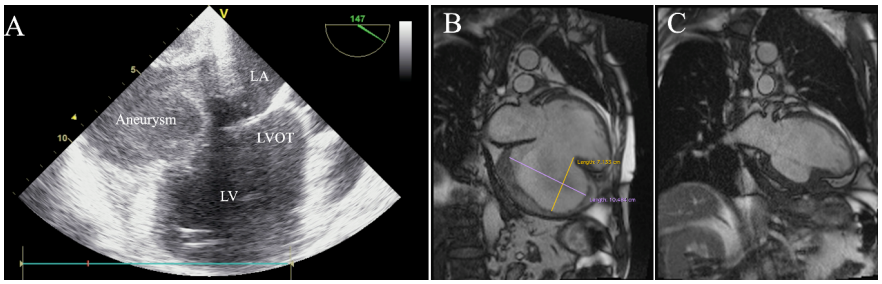

Figure 1. A, Intraoperative transesophageal echocardiography before repair. LA, left atrium; LV, left ventricle; LVOT, left ventricular outflow tract; B, MRI scan before repair; C, MRI scan after repair. Marked reduction of the aneurysmal cavity can be observed with successful LV cavity restoration.

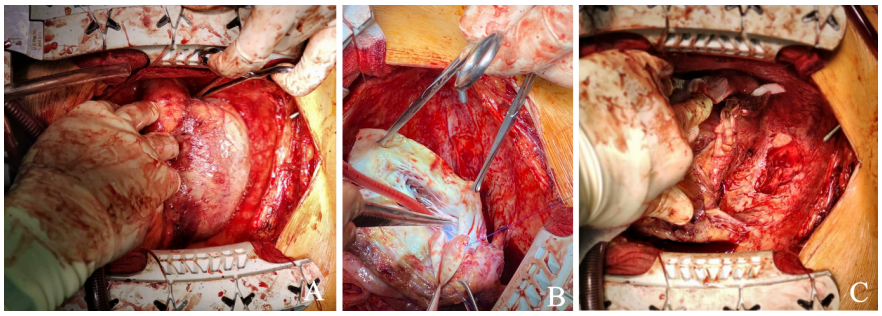

Figure 2. Operative treatment. A, intraoperative view after completion of cardiolysis; B, aneurysm is excised and thrombus is evacuated; C, endoventriculoplasty is completed, inferior wall suture line reinforced with felt strips is seen.