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A case report of a 72-year-old man with left ventricular free wall rupture following acute myocardial infarction.

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**A case report of a 72-year-old man with left ventricular free wall rupture
following acute myocardial infarction**

Opis przypadku 72-letniego mężczyzny z pęknięciem wolnej ściany lewej komory
w następstwie ostrego zawału mięśnia sercowego

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Abstract

Mechanical complications following acute myocardial infarction (AMI) are rare, but usually serious and associated with high mortality. This study reports a case of a 72-year-old man with a left ventricular free wall rupture secondary to acute myocardial infarction. Although percutaneous coronary intervention (PCI) programs have reduced the incidence of these complications, they remain a relevant issue in cardiac surgery units and one of the most important causes of short-term mortality in patients with myocardial infarction.

Keywords: acute myocardial infarction, left ventricular free wall rupture, mechanical complications of myocardial infarction, percutaneous intervention

Introduction

Mechanical complications after acute myocardial infarction (AMI) are rare, but they have dramatic consequences and high mortality [1]. This study presents a case report of a 72-year-old man with left ventricular free wall rupture as a result of acute myocardial infarction. Describing this case, the authors would like to emphasize that although these complications are now infrequent, they should always be taken into account, regardless of successful reperfusion.

Case-report

A 72-year-old patient with diabetes and chronic obstructive pulmonary disease (COPD) was admitted to the Department of Cardiology in the morning due to an anterior ST elevation myocardial infarction (STEMI). An urgent coronary angiography was performed, which revealed an occluded left anterior descending artery (LAD) (Figure 1) and three-vessel ischaemic heart disease. At the same time, angioplasty of the LAD branches was performed, where two drug-eluting stents were implanted (Figure 2), obtaining a good angiographic effect. The course of the procedure was without complications.

During follow-up, echocardiography showed hypokinesis of the apical segments and akinesis of the left ventricle apical, and a small amount of fluid behind the right ventricle. The patient remained haemodynamically efficient and monitored. At 11:30 a.m. cardiac arrest in pulseless electrical activity mechanism occurred. Resuscitation was initiated, resulting in the return of haemodynamically effective heart action. The patient was intubated and mechanically ventilated. Echocardiography showed features of cardiac tamponade. Simultaneously, pericardiocentesis was performed, obtaining a blood volume of 300 mL.

After cardiosurgical consultation, the patient was immediately qualified for surgical treatment due to the suspicion of rupture of the free wall of the left ventricle. After sternotomy, during direct cardiac massage, a bleeding site was localized on the anterior wall of the left ventricle. The left ventricle remained aneurysmally enlarged. The ruptured wall of the left ventricle was sutured by 5.0 suture with a pledget. In addition, the sewing area was covered with a matrix of tissue glue. After reperfusion with high doses of catecholamines, the patient was weaned off cardiopulmonary bypass. The time of extracorporeal circulation was 75 minutes. The patient was transferred to the Cardiac Surgical Intensive Care Unit. On admission, the patient was in cardiogenic and haemorrhagic shock. In the ward, an infusion of catecholamines was used and blood products were transfused. The patient required resternotomy due to bleeding and cardiac tamponade. At 6.40 p.m. on the same day, another sudden cardiac arrest took place. Despite intensive treatment, the patient was pronounced dead due to the lack of haemodynamic response.

Discussion

Mechanical complications following AMI include left ventricular free-wall rupture, ventricular septal rupture, papillary muscle rupture, pseudoaneurysm and true aneurysm [1]. Since the advent of primary percutaneous coronary intervention, there has been a significant

reduction in the incidence of these complications [2, 3]. The incidence of free wall rupture following AMI in the pre-reperfusion era ranged from 2% to 6.2% and decreased to 0.2% in the reperfusion era owing to the widespread use of primary percutaneous coronary intervention [2, 4]. It is worth noting that these rare mechanical complications may occur even after successful interventional treatment, as in the described case.

After the diagnosis of left ventricular wall rupture, the first step of treatment is pericardiocentesis as a temporary measure to relieve cardiac tamponade [2, 3]. Nevertheless, it may cause a dangerous increase of blood pressure with increased blood pressure on the damaged myocardium, which can lead to the expansion of a small tear into a rupture [2]. In addition, it may also be ineffective, when the pericardial sac contains predominantly thrombus [3]. To maintain haemodynamic stability, the administration of inotropic support, intravenous fluids, an intra-aortic balloon pump, or extracorporeal membrane oxygenation may also be helpful [3, 4].

Surgery is the ultimate treatment for a free-wall rupture. In practice, both sutured and sutureless techniques using adhesives or surgical glues can be used, with the second option becoming more popular [2, 3]. The objective of surgical treatment for a free-wall rupture is to relieve the tamponade, close the tear or stop bleeding, anchor repair on healthy tissue, and minimize distortion of heart geometry, while preventing subsequent relapses in the form of rupture or the formation of a pseudoaneurysm [2, 3].

Summary

Unfortunately, the hospital mortality of conservatively treated patients is very high and ranges from 75% to 90% [3, 4]. Despite the reduction in the incidence of these complications due to PCI programs, mortality is significant and they are still one of the most important causes of short-term mortality in patients with myocardial infarction [1, 2]. Analysing the available publications, the authors did not find a case report of a mechanical complication of AMI with such detailed photographic material, which makes this study particularly educational.

Article information

Ethics statement

Retrospective case description of a patient in the Department of Cardiac Surgery.

Author contribution

Equal division of responsibilities during writing the paper.

Acknowledgments

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Conflict of interest

The authors declare no conflict of interest.

Supplementary material

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Figure 1. Coronary angiography showing the occluded left anterior descending artery



Figure 2. After the percutaneous coronary intervention, successful reperfusion was obtained. Two drug-eluting stents were used