

Ventricular Septal Rupture Complicating Acute Myocardial Infarction: A Preventable Complication? Case Report and Review of the Literature

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ABSTRACT

Despite the significant reduction in mortality from acute myocardial infarction in recent decades due to adequate medical management, cardiac monitoring, and early reperfusion, the mortality rate from ventricular septal rupture remains considerable. The risk factors for this complication have been the subject of several studies such as hypertension, advanced age, female gender, absence of angina pectoris, and anterior location of the ischemia. Surgical repair techniques have evolved over time, but the prognosis remains very poor with a mortality rate unchanged since 1990. This is why it is very important to know the clinical manifestations to specify the diagnosis by echocardiography and to allow urgent medical and surgical management. We will illustrate this fatal complication of myocardial infarction and review the different factors that predict its development through a clinical case and a review of the literature.

KEYWORDS: Myocardial infarction, Ventricular septal defect, Coronary angiography, Surgery

I. INTRODUCTION

Ventricular septal defect after myocardial infarction is a rare but terrible complication with a very high mortality rate [1]. The prognosis is largely improved by surgical management. We will focus on the different predictive factors for the development of post-infarction ventricular septal defect and the value of prompt management through a clinical case and a review of the literature.

II. CASE REPORT

We report the case of a 57-year-old patient, an active smoker, who presented an inaugural infarct chest pain 4 days before his admission, initially neglected.

The evolution was marked by the occurrence of angina recurrences associated with acute dyspnea motivating a consultation and a hospitalization in our training.

The clinical examination revealed an orthopneic patient, with a regular pulse of 90 bpm, a blood pressure of 113/67mmHg, a holosystolic murmur in wheel radius on side 4/6, and crepitus rales at mid-field.

The electrocardiogram showed a regular sinus rhythm with a mean ventricular rate of 90 bpm and an inferior QS appearance.

The transthoracic echocardiography showed a 16mm muscular interventricular septal defect with a proximal left-right shunt, a hyperkinetic left ventricle with a good systolic

function of 63%, and a right ventricle with good function [Figure 1] [Figure 2].

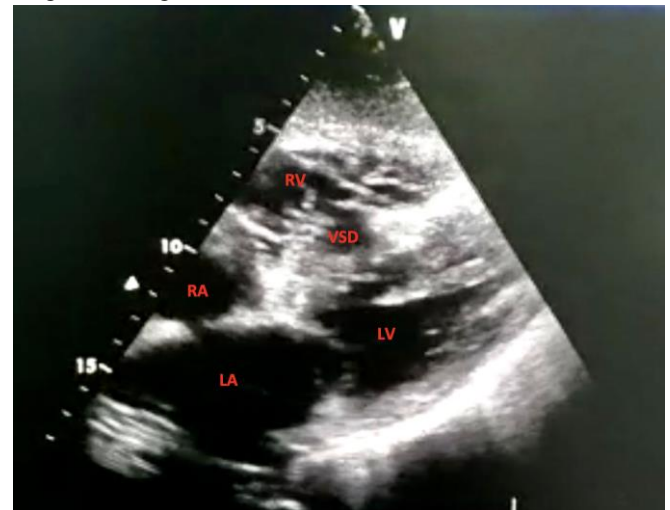


Figure 1. Transthoracic echocardiography in subcostal view showing ventricular septal defect. VSD: ventricular septal defect, LV: left ventricle, RV: right ventricle, LA: left atrium, RA: right atrium.



Figure 2. Transthoracic echocardiography in subcostal view with color Doppler showing the ventricular septal defect. **VSD:** ventricular septal defect, **LV :** left ventricle, **RV :** right ventricle, **LA :** left atrium, **RA :** right atrium.

Coronary angiography showed a tight subocclusive lesion of the right coronary artery that required the placement of an active stent. The patient remained hemodynamically stable. Surgical management of the ventricular septal defect was performed after 8 days by patching with simple follow-up.

III. DISCUSSION

Post-myocardial infarction septal rupture is a catastrophic event that can be life-threatening. In the pre-thrombolytic era, its incidence was 11% in anatomopathological series, and 2% in patients hospitalized for myocardial infarction. Currently its incidence is 0.2% [1], [2]. Mortality remains high, exceeding 90%. The delay of the occurrence of this complication is 3 to 10 days.

It occurs after a transmural infarction of the interventricular septum (anterior territory +++, inferior or lateral) leading to an intramural hemorrhage/hematoma in the infarcted area with tissue dissection followed by a rupture with the creation of a left-right shunt [3], [4].

Its location can be anterior, localized at the distal part of the septum by occlusion of the anterior interventricular artery (2/3 anterior of the septum) in 69% of cases [5]. It can also be posterior, located at the proximal and posterior part of the septum by occlusion of a dominant right coronary in 31% of cases, as in our patient.

The most-reported risk factors are advanced age, hypertension, anterior infarct territory, and female gender [1]. Myocardial infarction may be complicated by right ventricular failure in 45% of cases, left ventricular failure in 30%, and/or global ventricular failure in 20% cases. Cardiogenic shock is described in 60% of cases.

The positive diagnosis of septal rupture is echocardiographic. It is anterior in 69% and posterior in

31% of cases [5]. The treatment is medico-surgical as well as interventional. Urgent surgical repair was initially proposed in the 80s because medical treatment alone resulted in a mortality rate approaching 100% [6].

Surgical correction of acute complications of myocardial infarction remains difficult due to the fragility of the infarcted tissues, and in practice, it is performed after myocardial healing, i.e. after an average of 7 days after an acute coronary event [3].

The prognosis is still very poor with a very high mortality rate within 30 days after myocardial infarction, but the clinical evolution is favorable in certain situations as illustrated by the case of our patient [7]. This underlines the interest in early diagnosis and management.

IV. CONCLUSION

Post-myocardial infarction septal defect is an extreme emergency requiring multidisciplinary management involving emergency physicians, cardiologists, and cardiovascular surgeons. Despite the diversity of predictive factors of septal rupture, the main factor remains the absence of early reperfusion, hence the interest in optimizing management in the acute phase of myocardial infarction. Severe functional sequelae can be avoided by early myocardial salvage.

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