

The Unpredictable Heart Rupture Clinical Case in Emergency

William Zuccon, Michele Cacucci*, Elena Bertin, Ottavia Caserini, Minoja Guja and Giovanni Viganò.

Emergency Department - Major Hospital, Crema, Italy.

*Cardiology Unit – Major Hospital, Crema, Italy.

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Abstract: *Heart rupture is a particularly serious clinical condition and is characterized by a high mortality rate. This pathology is usually rare and is more likely to affect older women. It often follows as a complication of a myocardial infarction and the subsequent symptomatology is stackable to that of heart failure or cardiogenic shock. In the reported clinical case, the acute heart rupture occurred in correspondence with the free wall of the right ventricle, rapidly causing an important cardiac tamponade with an unfavorable course.*

Key words: heart rupture, clinical case, emergency

INTRODUCTION

The Authors report a particular case of heart rupture in an elderly woman. This pathology is rare, with a low overall incidence, mostly affects females and advanced age, and often has a fatal prognosis. It mainly results from an acute coronary syndrome that weakens the heart tissue, which tears under the action of the pump by contraction. The resulting symptoms often overlap with heart failure or cardiogenic shock. In the reported clinical case, the acute heart rupture occurred in the free wall of the right ventricle.

Clinical Case

Patient M.M. elderly woman with a history of arterial hypertension and previous transient cerebral ischemia and in pharmacological therapy with antihypertensives and cardioaspirin. The patient comes to our Emergency Department for stabbing chest pain, tachypnea, hypotension with peripheral hypoperfusion, mental confusion and bilateral edema of the lower limbs. Blood gas analysis demonstrates severe hypoxic hypercapnic respiratory failure (pO₂ 29.9 mmHg – pCO₂ 61.0 mmHg) with marked respiratory acidosis (pH 7.092) and hyperlactacidemia (9.7 mmol/L). Complete blood chemistry tests demonstrated a marked increase in high sensitivity Troponin I (9025.5 ng/L), D-Dimer 19.25 mcg/ml and Bnp - Natriuretic Peptide 791.0 pg/ml. The Ag-RDTs

rapid antigen and influenza tests were negative. The Electrocardiogram showed a pattern of atrial fibrillation with rapid ventricular response, lateral ST segment elevation as from ischemia, and a tendency to low QRS voltages (nonspecific pericardial effusion data) (Fig. 1). The confirmatory diagnosis was made on the basis of the data of the Transthoracic Echocardiogram by subcostal window (Fig.1): left ventricle with non-evaluable kinetics, right ventricle not collapsed, pericardial effusion with extensive thrombosis in correspondence with the free wall - apical of the ventricle right indicative of breakage. The patient died shortly after admission to hospital and life support in the immediate context of the emergency.

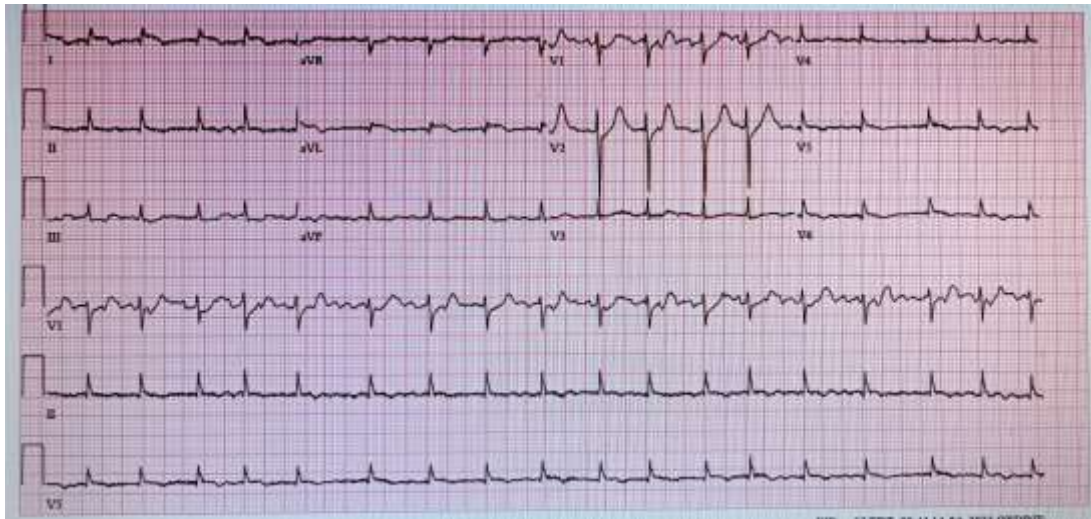


Fig.1. Heart Rupture: Electrocardiogram.

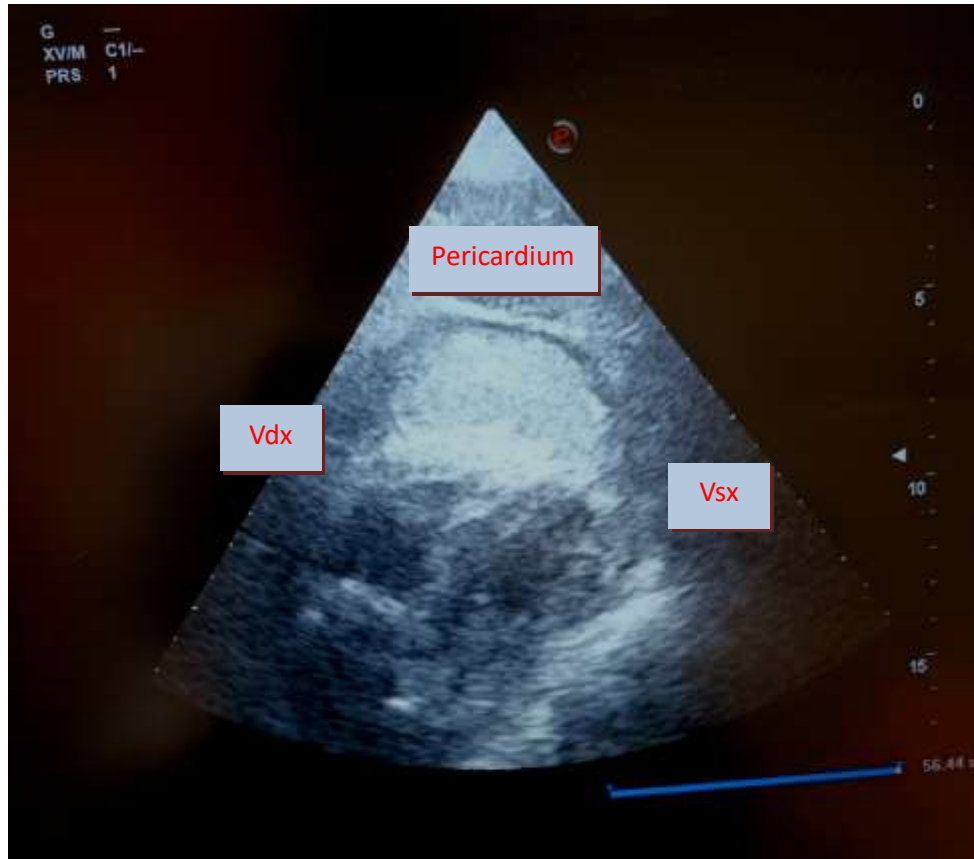


Fig.2. Heart Rupture: Transthoracic echocardiogram by subcostal window.

DISCUSSION

Heart rupture is rare and consists of laceration of the heart tissue, of one of the heart chambers of the atria or ventricles, or of the walls that separate them, mostly interventricular, or of the papillary muscles and valves, with a low overall incidence equal to 1.4%. The highest incidence of heart rupture is found in females, in old age and in subjects suffering from systemic hypertension; in some cases, it can cause sudden death without prodromal symptoms (1).

It generally represents a serious complication during an acute myocardial infarction, as the heart tissue, weakened by the infarction, can break when the heart exercises its pump function by muscle contracting; more rarely it can be a consequence of cardiac trauma, endocarditis, tumors or infiltrative heart disease, aortic dissection or iatrogenic. During a heart attack, myocardial rupture usually occurs after the first 24 hours of the event, typically occurs from 3 to 5 days later, and is most common with the first infarction episode (2).

Regarding the pathophysiological aspect, it can involve the interventricular septum, the papillary muscle or the free wall of the ventricle, anterior or lateral; in the latter case the left ventricular myocardium is more frequently involved than the right, it is the most common form of the other previous ones and is almost always fatal (3).

Symptoms overlap with those of heart failure or cardiogenic shock with haemodynamic deterioration; in particular, precordialgia or chest tightness, hypotension with tachycardia, tachypnea (pulmonary edema may develop rapidly), organ hypoperfusion (algid diaphoresis with cold and pale skin, anuria and mental confusion) and syncope up to cardiac arrest. Some characteristic signs are distension of the jugular veins (sign of pulmonary hypertension) and paradoxical pulse (drop in blood pressure of more than 10 mmHg during inspiration, with possible disappearance of the arterial pulse) (4).

Consequently, therapy varies according to the onset and location of the heart rupture. As in the case report, most patients with acute ventricular free wall rupture do not have time for surgery. If time permits and in selected cases, also in relation to the patient's comorbidities, US-guided pericardiocentesis can be attempted if surgical management is not immediately available or if the patient is too unstable, with drainage of very small amounts of hemopericardium (maintaining blood pressure around 90 mmHg as a bridge to emergency surgery) and/or with the subsequent intrapericardial infusion of fibrin glue (5, 6).

In a cases of an early diagnosis, sometimes possible thanks to the combination of clinical and echocardiographic criteria, the prognosis can change only in a few of cases, therefore it cannot be considered a satisfactory solution to this clinical problem. As reported in some clinical studies, in the course of myocardial infarction, the incidence of postinfarction heart rupture can be significantly reduced by treating patients susceptible to reperfusion treatment with primary coronary angioplasty (7,8).

CONCLUSION

In the reported case report, heart failure was a truly catastrophic and unexpected condition; the myocardial rupture due to a probable post-infarction cause acutely involved the anterior free wall of the right ventricle causing hemopericardium and subsequent impairment of filling of the cardiac chambers by cardiac tamponade.

In general, cardiac rupture represents a particularly serious clinical situation characterized by a still very high mortality rate. In fact, this condition mostly has a poor prognosis and the imminence of the event, with the separation of the muscle tissues, is currently difficult to predict in the individual patient.

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Declaration

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Authors' Contribution

ZW: Planned work, conducted the literature search and produced the report.

MC and EB: Reviewed literature and produced the report.

OC and MG: Helped in contributed to produce the report.

ZW and VG: Final revision before delivery.

All authors have reviewed the final report and approve its publication.

Conflict of interest

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Ethical considerations

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Address for correspondence and reprint requests to:

dr. William Zuccon

Major Hospital, Crema, Italy

Email: w.zuccon@asst-crema.it