



CASE STUDY

INTERVENTRICULAR COMMUNICATION AND LEFT VENTRICULAR ANEURYSM COMPLICATING MYOCARDIAL INFARCTION

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ABSTRACT

The combination of interventricular communication and left ventricular aneurysm is a rare situation. The interventricular communication is a lethal complication of myocardial infarction; it is a diagnostic and therapeutic emergency; it is observed in the anterior infarction and it is associated with a poor prognosis, the treatment involves surgical repair. The rupture of the basal portion of the septum is much rarer. Through the case of a patient who was hospitalized in our service, we illustrate the deadly complications of myocardial infarction while discussing its rare localization in the inferior left ventricular wall, its clinical, electrical and echocardiographic characteristics, as well as its rapidly fatal evolution without emergency care.

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INTRODUCTION

The myocardial rupture is a rare but often fatal complication of acute myocardial infarction. It occurs during the first week after the inaugural episode, its current rate is only 1 to 2%, but it represents 10 to 15% of the factors associated with early hospital mortality from myocardial infarction. Its association with an aneurysm in the same patient is extremely rare, and the treatment involves surgical repair.

Patient and case report

We report the case of a 59 years old patient, diabetic and chronic smoker, presented in the third day following the onset of acute myocardial infarction. The cardiovascular examination found a blood pressure at 130/80 mmHg, a heart rate at 90 bpm and cardiopulmonary auscultation revealed the presence of a systolic murmur in wheel radius. The electrocardiogram enrolled a sinus rhythm with an inferior ST elevation and lower Q necrosis. The transthoracic echocardiography objectified an infero-septal akinesia with a normal global left ventricular systolic function (the estimated left ventricular ejection fraction was at 59%) and the presence of an aneurysm (Figure 1) measuring 17x32 cm in basal

segment of the infero-septal wall associated at an interventricular communication measuring 10 mm (Figure 2 & Figure 3); the right ventricle was slightly dilated with a systolic dysfunction with SPAP of 55 mmHg. The angiography defined the presence of atheromatous coronary network with occlusion of the right coronary artery (Figure 4) and intermediate stenosis of the circumflex artery. The patient was put under optimal anti-ischemic treatment with indication of emergency surgical treatment but the evolution was rapidly fatal by refractory cardiogenic shock.

DISCUSSION

The septal rupture is a fatal complication of myocardial infarction; its actual incidence after the advent of thrombolysis is only 0.2% (1.2); it appears in the anterior myocardial infarctions and affects in general the apical portion of the transmural necrosis (1.3). The interventricular communication of the basal portion of the septum is much rarer and it is the prerogative of the inferior infarctions and it is associated with poor prognosis, considering the difficulties of surgical repair, frequent extension to the right ventricle (4.5) and the possible association with mitral regurgitation. Our patient had a rare location in the inferior territory related to occlusion of the right coronary artery to coronary angiography with a septal rupture located at the basal segment of the infero-septal wall with a right extension but without the mitral regurgitation. The

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clinical presentation was characterized by the appearance of an intense holosystolic murmur, diffuse but maximum at the left sternal edge.



Figure 1. Echocardiographic section four chamber showing an aneurysm in basal segment of the infero-septal wall

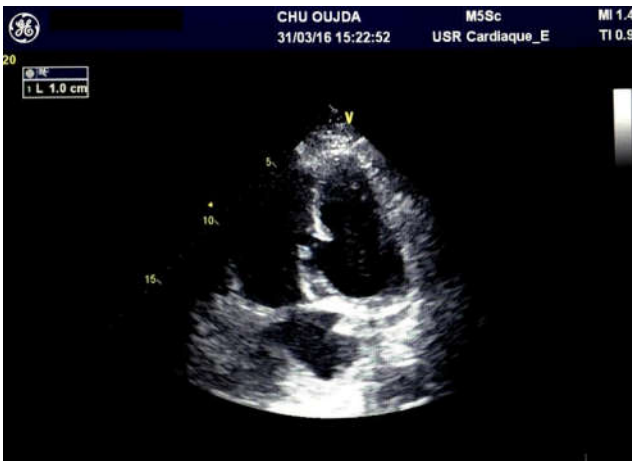


Figure 2. Echocardiographic aspect of the interventricular communication

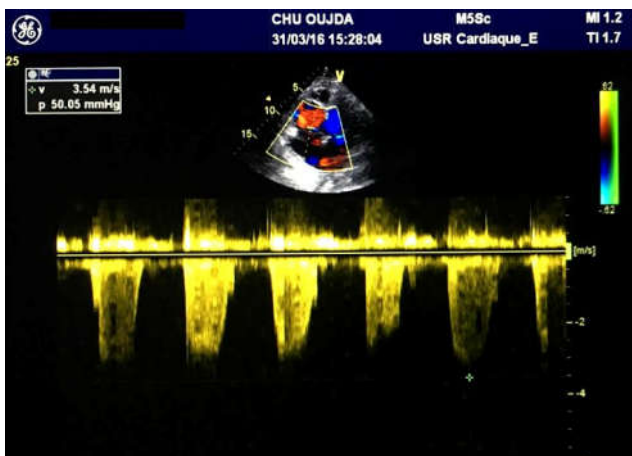


Figure 3. Appearance of the flow of the interventricular communication at the continuous Doppler

The transthoracic echocardiography is the gold standard for diagnosis and evaluation of post-infarction interventricular communication with a very high sensitivity and specificity (Lazopoulos *et al.*, 2009), it allows the diagnosis certainty, quantifying the significance of the shunt, assesses its

hemodynamic effects and searches for secondary locations (Maurer *et al.*, 1987; Helmcke *et al.*, 1990). The combination of an interventricular communication and a left ventricular aneurysm found in our patient, is a rare and highly lethal complication requiring urgent surgery (Held *et al.*, 1988). The interventricular communication may appear within a few hours to a week after the necrosis, with most between the second and fourth days (Crenshaw *et al.*, 2000; Menon *et al.*, 2000).

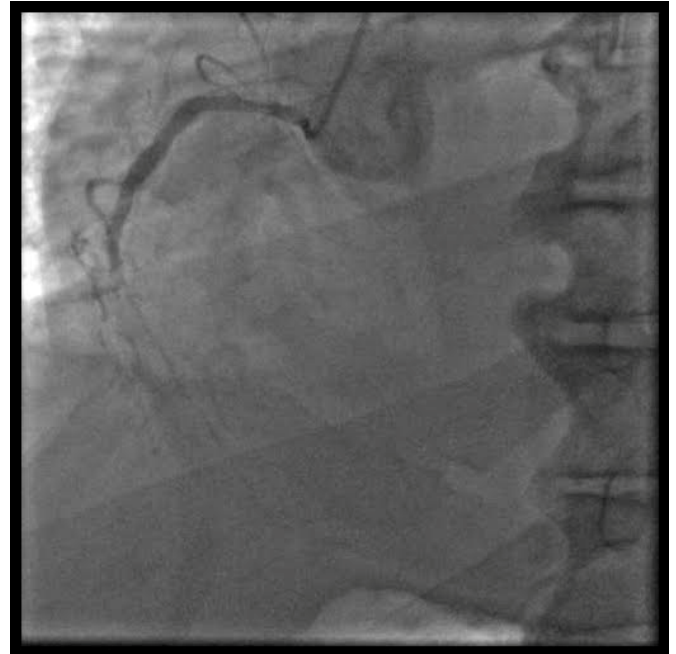


Figure 4. The occlusion of the right coronary artery at the angiography

Its treatment involves surgical repair by closing with prosthetic patch which remains challenging with the fragility of infarcted tissue. Two approaches are generally adopted: a deferred repair 6 to 8 weeks after myocardial infarction to perform a repair on stronger scar tissue and this in case of hemodynamic stability and smaller interventricular communication; or an emergency repair because of the patient's hemodynamic instability. According to the recommendations of the American College of Cardiology 'American Heart Association (ACC-AHA Class I recommendation) (Ryan *et al.*, 1999), the surgical repair should not be delayed, regardless of the patient's clinical condition. This it was the case of our patient for whom an urgent surgery was indicated despite his hemodynamic stability initially. The first interventions for the repair of aneurysm ventricular were described in 1944 by Beck (Beck, 1944), which carried out an external reinforcement of the aneurysm wall by the fascia lata. Despite adequate care, the prognosis of this disease is grim; with an estimated mortality of 30%. The two main factors of the septal rupture are the importance of global systolic dysfunction secondary to myocardial infarction, and the extent of septal defect whose main event is the hemodynamic instability. Our patient could not benefit from urgent care and died of cardiogenic shock during the first week following the myocardial infarction.

Conclusion

The combination of the interventricular communication and the left ventricular aneurysm is a rare but lethal complication of myocardial infarction, these serious functional sequelae can be avoided through early myocardial salvage. Rapid diagnosis and

urgent surgical treatment significantly improves patient outcomes.

Competing interests

"Authors declared they have no conflict of interest"

Authors' contributions:

All authors contributed to the conduct of this work. All authors also claim to have read and approved the final manuscript.

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