

CASE REPORT

Use of ECMO as a bridge to repair of interventricular septum rupture

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Ventricular septal rupture (VSR) as mechanical complication of ischemic heart disease is considered a surgical emergency. A 72-year-old male patient presented an acute infarction, ruptured interventricular septum was diagnosed. ECMO was placed as bridge to surgery. It was carried out 14 days post-rupture, myocardial revascularization and VSR closure was performed, ECMO was withdrawn 2 days after surgery. ECMO is an option in unstable patients with VSR as a bridge to corrective surgery.

Key words: Acute myocardial infarction; ECMO; Ischemic heart disease; Ventricular septal rupture.

La ruptura septal interventricular como complicación mecánica de cardiopatía isquémica es urgencia quirúrgica. Un paciente masculino 72 años presentó infarto agudo, se diagnosticó ruptura de septum interventricular, se colocó ECMO como puente a cirugía, se llevó a 14 días post-ruptura, se realizó revascularización coronaria y cierre de ruptura. Se retiró ECMO 2 días posteriores. El uso de ECMO es opción en pacientes inestables con ruptura de septum puente a cirugía correctiva.

Palabras clave: Infarto agudo del miocardio; ECMO; Cardiopatía isquémica; Ruptura del tabique interventricular.

Cir Card Mex 2023; 8(3): 80-81.

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Ventricular septal rupture as a mechanical complication of ischemic heart disease is considered a surgical emergency. Although the current incidence is low at 0.5-1%, it is a serious condition with a high mortality rate [1]. Repair within the first 7 days has a high mortality rate of 47-88% [2]. Myocardial tissue fragility in the first few days is an important factor. In those who choose conservative treatment, mortality is 91% [3]. Patients who survive 14 to 21 days and undergo corrective surgery have the best prognosis, representing less than 30% of all cases [3]. Because of the low percentage of patients who survive before surgery, cardiovascular or circulatory support measures are used as bridging therapy.

CLINICAL CASE

A 72-year-old male patient presented acute myocardial infarction in the anterolateral wall of the left ventricle, which was treated by means of fibrinolytic therapy without reperfusion criteria. Three days after the event, he presented with a proto-meso-systolic ejection murmur, intensity III /IV. Echocardiography diagnosed a 10mm by 12 mm posterior rupture of the interventricular septum and cardiogenic shock.

It was decided to use a circulatory support system with extracorporeal membrane oxygenation (ECMO) as a bridge to surgery. It took up to 14 days after rupture to perform coronary artery bypass grafting and closure of the ruptured septum with a bovine pericardial patch using the Daggett technique (Fig. 1). Because of the improvement in hemodynamic parameters, ECMO was discontinued two days after the procedure.

Twenty-four hours after the surgical procedure, weaning from ECMO was started, with clinical and echocardiography criteria for retirement. Withdrawal was decided within the following 24 hours, supported by dobutamine and norepinephrine at moderate doses.

The patient presented vascular complication of the lower left extremity (cannulation site) being necessary supracondylar amputation 2 days after removal. Weaning from inotropes and vasopressors in the following 24 hours. However, 5 days after the amputation he presented data of infection of the surgical wound site at the femoral cannulation site, refractory septic shock and death on the seventh day after amputation.

COMMENT

Optimal time for repair of post-infarction ventricular septal rupture is between 8 and 21 days after infarction with a mortality rate of 30% [3]. Unstable patients require bridging thera-

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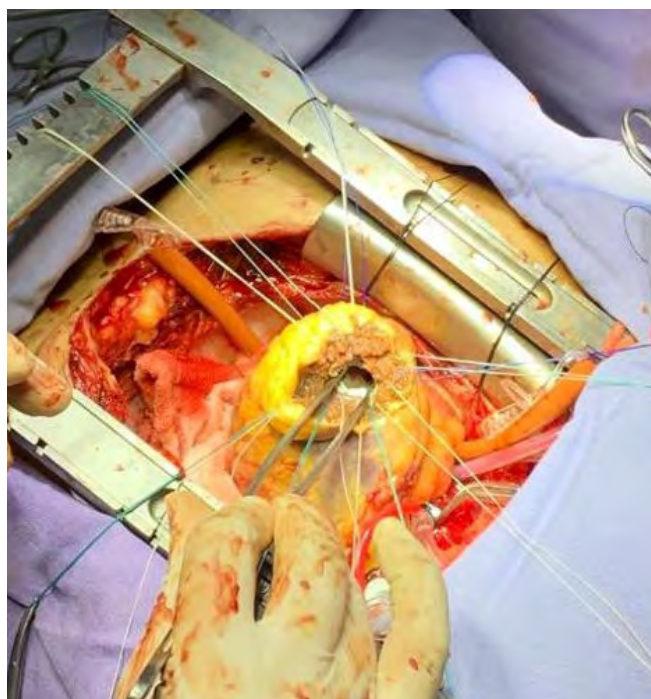


Figure 1. Post-infarction interventricular septum rupture repair with Daguett's technique.

py such as intra-aortic balloon counterpulsation. However, this could be insufficient some cases.

Recently, ECMO has been used as bridging therapy for repair [4], and the use of other devices such as Impella [1] is also being considered. In the case of this patient, ECMO was used as a bridging therapy until surgery with a satisfactory outcome. At our institution, the strategy developed by Dr. Brandon Jones [3] is used, in which he stratifies patients according to their hemodynamic status to determine the best treatment (Fig. 2).

The use of ECMO should be considered in unstable patients with interventricular septal rupture as a bridge to repair surgery in a time window with lower perioperative mortality. In ECMO therapy, teamwork and multidisciplinary work is essential to achieve good outcomes.

FUNDING: None

DISCLOSURE: The authors have no conflicts of interest to disclose.

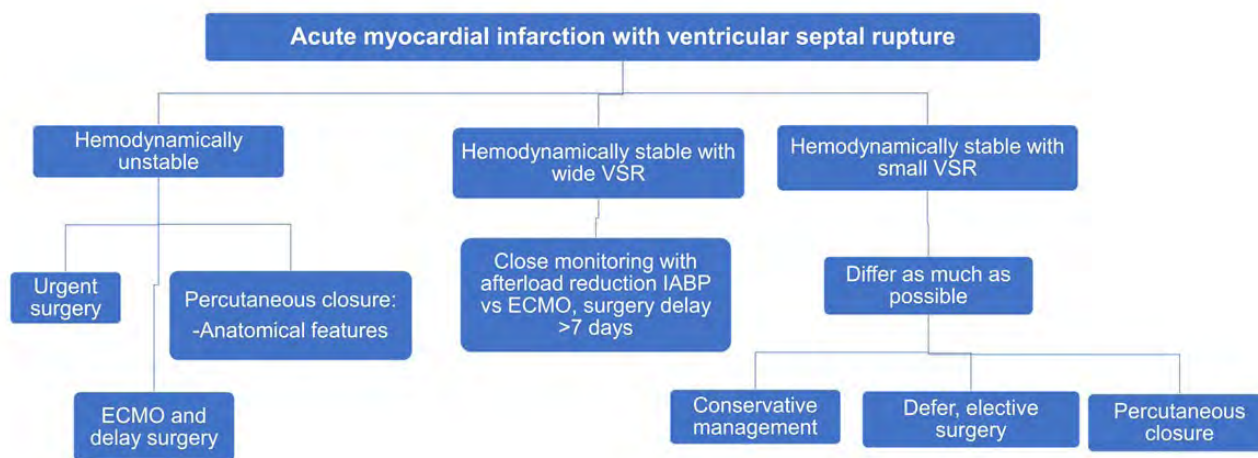


Figure 2. Management algorithm for acute myocardial infarction rupture with interventricular septum rupture. ECMO, extracorporeal membrane oxygenation. RSV, interventricular septum rupture. IABP, intra-aortic balloon counterpulsation.

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