

Hepatic embolization due to hepatic rupture, cardiopulmonary post-reanimation in acute myocardial infarction

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ABSTRACT

A 37-year-old male patient, who after performing cardiac reanimation maneuvers, was diagnosed with an acute myocardial infarction and two coronary stents were placed percutaneously. The patient's condition deteriorated 36 hours after surgery, and when a CT scan was performed, a subcapsular hepatic hematoma was observed. He was submitted to embolization one of the hepatic artery branch and subsequent drainage of 2000 ml of blood by means of a minilaparotomy. The patient presented progressive improvement after the interventions.

Key words: Hepatic embolization. Acute myocardial infarction. Cardiopulmonary resuscitation. Hepatic trauma.

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INTRODUCTION

The anesthesiologist faces cases of critical patients, such as this one, every day. The objective is to show a therapeutic alternative that can save lives, the greatest gift human beings have.

Liver laceration is a complication that can occur after performing reanimation maneuvers, with blood loss that in this case was probably exacerbated by the anticoagulants the patient's received due to the placement of coronary stents in the course of a myocardial infarction.

CLINICAL CASE

A 37-year-old male patient with a history of two-day acute myocardial infarction, bronchial asthma, obesity, arterial hypertension, and insulin-dependent diabetes mellitus.

Two days before he had a syncope and cardiac arrest during the exercise. He needed extra-hospital reanimation maneuvers performed by non-medical personnel. Initially, he was taken to a local clinic where the problem was not solved. Eight hours later he was transferred to a second clinic where acute lower-face infarction was diagnosed. Cardiac catheterization results: anterior descending artery injury occluded from the proximal segment. He receives insufficient hetero-coronary, collateral circulation, severe circumflex disease involving his atrioventricular and second marginal branch, as well as right coronary artery with sub-occlusive disease in a proximal third party and severe in one third Distal. Two stents were placed in the proximal and distal segments of the right coronary artery, which solved the acute condition. He was stable in the ICU, preparing for cardiac surgery and with the following laboratory results: CPK 1036 U/l (normal values: <190 U/l in men), CPK MB 57.00 U/l (normal values: <25.6 U/l), serum creatinine 1.85 mg/dl, troponin T 0.60 ng/dl (normal values <0.20 ng/dl). When entering, the patient received aspirin and ticagrelor which were then discontinued and replaced by low-molecular-molecular-weight heparin.

After 36 hours, the patient suddenly had tachycardia, hypotension and diaphoresis. The following laboratory results were observed: Hb 5.4 g/dl; Hct: 15.9%; Platelets 193,000; PT 19.5 s; INR: 1.89; PTT: 24 sec. In ICU parameters were optimized. He was polytransferred and subsequently showed the following results: Hb: 9.7g/dl; PH: 7.29; PO₂: 53mmHg; HCO₃: 22.6mmol/l; PCO₂: 46.7mmHg;

SatO₂: 83%; FiO₂: 0.6; inotropic and vasopressor drugs at full doses.

Chest x-ray: bilateral pulmonary, peri-bronchial, interstitial increase.

Abdominal ultrasound: free fluid in the abdomino-pelvic cavity.

CT Scan: Subcapsular hepatic hematoma of approximately 200ml. Free liquid in abdominal cavity with hematic density of approximately 1500ml. Echocardiogram: EF: 40%.

Diagnosis: hemoperitoneum for probable liver injury. Laparotomy was planned for hepatic packing and evacuation of hemoperitoneum.

The anesthesiologist did a pre-anesthetic assessment and requested a pneumological risk test, aortic balloon pump, blood recovery equipment, and medical board, proposing medical inter-consultation with an interventional surgeon for the possibility of endovascular hepatic embolization.

The aortic balloon pump was not gotten. The interventional surgeon accepted to perform the hepatic embolization. The patient was intubated in ICU by the anesthesiologist. Fentanyl 6 ug/Kg, midazolam 6 mg, rocuronium 0.6 mg/Kg were used. He was placed under mechanical ventilation providing support for severe respiratory failure. Central venous catheter and intra-arterial catheter were placed.

The patient was changed to the hemodynamics unit. The surgery team remained expectant during the procedure. The anesthetic maintenance was with remifentanyl at doses of 0.20 ug/Kg/minute and propofol with TCI 2Nug/ml. The patient maintained his hemodynamic parameters stable during the procedure and an angiography of the celiac trunk plus embolization of the hepatic T3 artery was successfully performed. The patient came out stable. Respiratory parameters with pressure ventilation with high PEEP and inotropic support, and low doses vasopressor.

After the procedure, because of the presence of blood and clots in the abdominal cavity, there was a high risk of sepsis. The surgeon on call decided to postpone his evacuation until 7:00 am (the embolization was performed between 1:00 am and 3:00 am) and after a medical board, a minilaparotomy was performed in which around 2 liters of clots were drained and drains were left.

The patient had progressive improvement and was discharged. After a month, he had a successful cardiac surgery.

DISCUSSION

In many cases of acute myocardial infarction requiring CPR, the associated hemodynamic changes may hide hepatic rupture, which unsuspected may delay its diagnosis¹ (Kouzu *et al*).

Hepatic rupture following CPR, even performed by experts and in the absence of costal fractures, is a life-threatening complication and may occur in 2.1% according to Riera² *et al*. Wi J³ *et al* report in a follow-up of 14 years an occurrence of 0.6% and Gil⁴ of 2.9%. In this case, acute anemia initiated the diagnostic process. The diagnosis was obtained by computed tomography requested on the base of the clinical and ultrasound history.

The patient was to undergo non-cardiac emergency surgery: laparotomy for hepatic packing and evacuation of hemoperitoneum. A medical board in which all those involved in perioperative management sought the best solution to the problems aggravated by hypoxemia, hypercapnea, acidosis and anemia was vital, and a less invasive procedure was chosen, since cardiac complications are from 2 to 5 times more likely in emergency surgeries⁵.

Hepatic embolization is a therapy that in our environment sometimes is not considered as an alternative, because it requires a hemodynamic room, specialized staff and equipment. In Peru, this procedure has been performed for almost 20 years in EsSalud and is currently used for the treatment of primary tumors (broken and non-ruptured hemangioma), but the hepatic chemoembolization variant is more frequently performed in secondary tumors of the liver. It is much more used in other countries in cases of hepatic rupture due to traumas or associated to HELLP Syndrome.

We must consider that liver lesions by traumas are important cause of morbidity and mortality in children and adults, as HELLP syndrome^{4,7} is. The efficacy of embolization is well established with success between 85% and 100%^{6,8}. The traditional therapy is laparotomy, but the hemodynamic instability⁶ that many times accompanies the symptoms is aggravated

by greater surgical stress and the greater requirement of anesthetic drugs when compared with intravascular embolization. Therefore, in this case, timely angiographic embolization avoided the surgical procedure, a decision that was made evaluating risks vs. benefits. Hardy *et al*⁹ reported a case of blunt hepatic trauma in a child who had a successful hepatic embolization and reports that avoiding surgical intervention reduced mortality. Ling Kong *et al*¹⁰ reported a retrospective study of 70 patients with blunt trauma whose hepatic embolization was successful, but in their work they excluded patients with hemodynamic instability.

The requested balloon pump reduces perioperative cardiac risk in non-cardiac surgery in patients with unstable coronary syndromes who go to emergency non-cardiac surgery⁵. This ventricular assistance device increases myocardial oxygen supply by increasing diastolic coronary perfusion pressure, which increases myocardial and subendocardial perfusion but it was not available.

Hepatic embolization is a procedure that should be considered for the treatment of hepatic rupture of different etiologies: post-CPR trauma or traffic accidents and HELLP syndrome, even more if it is associated to high cardiac risk. We pretend this report motivates greater investigation to support that this technique becomes one of the first options of treatment in this type of cases.

GRANTS OR FINANCIAL SOURCES

Nothing.

CONFLICTS OF INTEREST

The authors do not report conflicts of interest regarding the present manuscript.

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