REGIONAL ANESTHESIA AND TAKOTSUBO CARDIOMYOPATHY: A CASE REPORT

Lúcia Gonçalves[1], Pedro Godinho[1],
Andreia Mafra[1] and Elisabete Valente[1]

Abstract

Takotsubo cardiomyopathy (TC) is a reversible condition that mimics acute coronary syndrome, induced by physical or emotional stress. This report presents a female patient, 69 years, ASA Physical Status class III, with TC history, proposed for osteosynthesis of right diaphyseal humeral fracture. Supraclavicular ultrasound-guided approach to continuous brachial plexus block and sedation were chosen. The patient remained hemodynamically stable during and after surgery. Regional anesthesia may mitigate the release of catecholamines associated with intubation, surgical stress and extubation and may be a good option for TC patients.

Introduction

Takotsubo cardiomyopathy (TC) is non-ischemic type of cardiomyopathy that mimics the signs and symptoms of acute myocardial infarction[1]. Clinical manifestations include chest pain followed by ST segment elevation, and elevation of cardiac enzymes associated with myocardial injury[2]. The prevalence of TC is 1-2% among patients with suspected myocardial infarction[1,3].

The pathophysiology of TC is not fully understood. It is hypothesized that the excessive release of catecholamines associated with physical or emotional stress may be related with cardiomyotoxicity, coronary artery vasospasm, coronary microvascular dysfunction and left ventricular outflow obstruction. During the acute stages of TC, catecholamine concentration has been reported to increase 20-fold compared to myocardial infarction[4-6].

Clinical suspicion is essential for accurate diagnosis, along with the performance of electrocardiogram (ECG), cardiac catheterization, dosage of cardiac markers associated with myocardial injury and echocardiogram[7]. The Mayo Clinic Criteria are commonly used for TC diagnosis (Table 1)[8].

1 Department of anesthesiology. Centro Hospitalar de Leiria, EPE, Leiria, Portugal.
Corresponding Author: Lúcia Gonçalves: Hospital de Santo André, Rua das Olhalvas, 2410-197 Leiria, Portugal. Tel: +351 969147415. E-mail address: lucia.jmgoncalves@gmail.com

Table 1
Mayo Clinic diagnostic criteria for Takotsubo cardiomyopathy

Table 1. Mayo Clinic diagnostic criteria for Takotsubo cardiomyopathy

Transient hypokinesis, akinesis, or dyskinesis of the left ventricular mid segments with or without apical involvement; the regional wall motion abnormalities extend beyond a single epicardial vascular distribution; a stressful trigger is often, but not always, present.
Absence of obstructive coronary disease or angiographic evidence of acute plaque rupture.
New electrocardiographic abnormalities (either ST-segment elevation and/or T-wave inversion) or modest elevation in cardiac troponin.
Absence of: pheochromocytoma, myocarditis.

Source: MADHAVAN M AND PRASAD A. Proposed Mayo Clinic criteria for the diagnosis of Tako-Tsubo cardiomyopathy and long-term prognosis. Herz. 2010; 35: 240-244.

The therapeutic approach for TC typically consists in controlling its symptoms. In the absence of complications, the clinical manifestations of TC revert without sequelae. The probability of reoccurrence is lower than 10% and patients with TC history require long-term monitoring[9].

As the perioperative period is associated with significant physical and emotional stress, it is recommended that all patients with TC history are closely monitored during this time. In this report, we describe a female patient with TC history proposed for osteosynthesis of right diaphyseal humeral fracture, and assess the selected perioperative approach.

Case Report

This report presents a female patient, aged 69 years, ASA Physical Status class III, proposed for osteosynthesis of right diaphyseal humeral fracture. Relevant medical history included dementia, poorly controlled hypertension and TC diagnosed 6 months prior to surgery. No echocardiographic changes were observed on the preoperative assessment. The patient was observed by the cardiology department and approved for surgery.

Intraoperative monitoring included 5-lead ECG, invasive blood pressure, oxygen saturation and urine output. After premedication with intravenous midazolam (2 mg), an arterial line was placed in the right radial artery. The anesthetic procedure consisted in a continuous brachial plexus block through a supraclavicular ultrasound-guided approach. A 30 mL bolus of ropivacaine 0.5% was administered (Figure 1 and Figure 2). The patient was sedated with propofol in perfusion (0.02 mg/kg/min) and supplemental oxygen (60%) was delivered through a Venturi mask. The patient remained hemodynamically stable throughout the surgery (120 minutes).

After surgery, the patient was transferred to the post-anesthesia care unit, and remained hemodynamically stable and without complications. Postoperative analgesia included intravenous paracetamol (1000 mg). After motor block resolution, a 15 mL bolus of ropivacaine 0.2% was inserted through the perineural catheter and continuous perineural anesthesia was set with ropivacaine 0.2% at a 5 mL/h rate for 2 days.

The patient did not have pain complaints nor need for additional analgesic therapy the day after the surgery. Neither hemodynamic complications nor pain complaints were observed during the postoperative period, and the patient was discharged after 3 days.

Discussion

Takotsubo cardiomyopathy usually follows a reversible course. However, complications may occur, which may increase patient morbidity and/or mortality, particularly when accompanied by serious comorbidities[10,11]. Despite the lack of consensus regarding the anesthetic approach for TC patients, procedures should reduce the excessive catecholamine release, thus preventing the clinical manifestations of this condition[12].

Ideally, TC patients should have surgery in hospitals with cardiology department, hemodynamic monitoring and coronary care unit, allowing for appropriate perioperative monitoring and intervention, if necessary[11].

Appropriate premedication is essential to control patient anxiety; in this case, intravenous midazolam was used. As for the anesthetic approach, a peripheral nerve block seemed suitable to mitigate the release of catecholamines associated with laryngoscopy, intubation and extubation. Moreover, regional anesthesia allows for continuous postoperative analgesia and reduced risk of hemodynamic complications[11,13]. The patient was also sedated with propofol to minimize the risk of anxiety associated with being conscious during surgery.

It has been described that prophylactic beta-blockers may be useful to prevent acute stress. However, the appropriate dose is unclear and it is required to be attentive to the individual response of each patient[14]. In this case, such medication was not needed, as the patient remained hemodynamically stable.

During the intraoperative period, continuous monitoring by invasive blood pressure and 5-lead ECG is recommended by several authors[11,15], which is in accordance with our approach. The patient did not present complications nor pain and was discharged after few days.

Case reports of surgical procedures in TC patients are of particular importance, due to the low number of reported cases and lack of consensus regarding their perioperative approach. For TC patients with surgical indication, perioperative procedures should avoid a TC reoccurrence and complications, keeping in mind the type of surgery and the best suited anesthetic approach. While the risk of excessive catecholamine release should be considered, the risk of surgical/anesthetic complications and patient wellbeing must also be measured.

Fig. 1

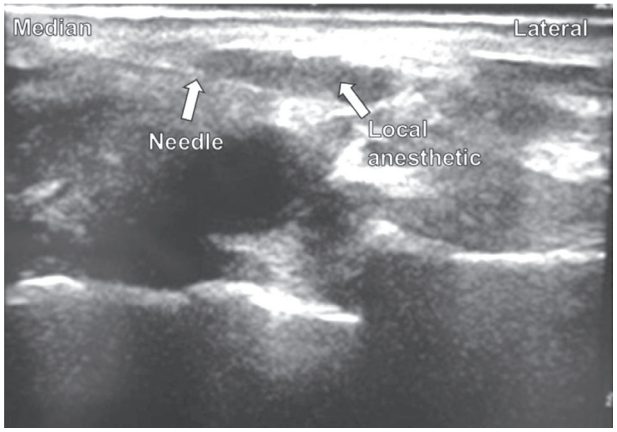
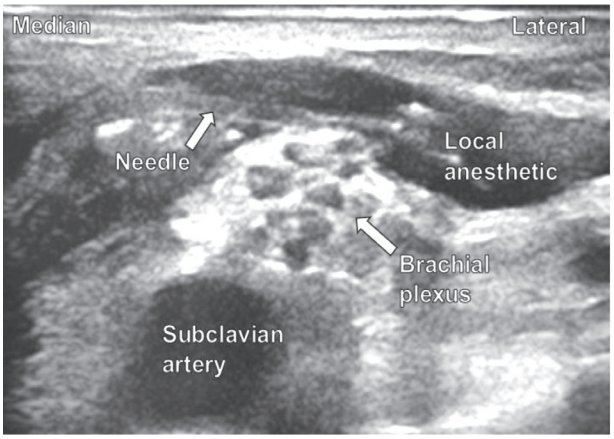


Fig. 2



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