Successful Resuscitation of Patient with Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC) Presented for a Gynaecology Procedure

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Introduction:
It has been known that arrhythmogenic right ventricular cardiomyopathy (ARVC) is one of the main causes of sudden death. Generally nonsustained or sustained ventricular tachycardia (VT) and ventricular fibrillation are responsible for sudden death [1]. We reported that a patient with a history of ARVC had drug resistant bradycardia and developed into asystole complicated with biventricular heart failure during a gynecological procedure.

Case Description:
A 35 year-old female (160cm, 68Kg, BMI 26.2), PMH of ARVC s/p ablation and implantable cardioverter defibrillators (ICD) placement under general anesthesia 5 months ago, bradycardia (~50bpm) as the baseline, on nadolol 30mg qd, presented for an elective Dilation and curettage (D&C) after having an incomplete miscarriage (G1P0, gestational age 9wk+3). She was supposed to undergo another ablation as an outpatient but was found to be pregnant. We discussed the anesthesia risks of patients with the history of ARVC with the cardiologist and the gynecologist, the procedure was planned to do under general anesthesia. She received the premedication of versed 1 mg and scopolamine patch 1.5 mg. With standard ASA monitors and pre-oxygenation, the IV induction was smooth with fentanyl 50 mcg, lidocaine 50 mg and etomidate 20 mg. The intubation was atraumatic with direct laryngoscope. She was hemodynamically stable after intubation, BP 110/70, HR 60s.

During the procedure, She had an episode of bradycardia (~30bpm) with hypotension when the cervix was manipulated. She received iv glycopyrrolate (0.2mgx2) and atropine (0.5mgx1) during the initial bradycardia without response. The oxygen saturation was kept at 100%. Her HR continued dropping down and she became nearly asystolic. A code was initiated and ACLS was started. She was given iv epinephrine per the ACLS protocol and had a pulseless VT episode. She was shocked 5 times and was treated with epinephrine and norepinephrine drips. She was coded twice and returned to spontaneous circulation between the codes. A stat TEE was done which showed RV failure and EF 10-15%. Cardiothoracic surgeon immediately placed a direct impella 5.0. While the patient remained hypoxic, the venoarterial extracorporeal membrane oxygenation (VA ECMO) was placed (Right Atrium and Pulmonary Vein cannulation). Patient was remained hemodynamically stable. Impella was removed 4 days later. D&C surgery was completely done 1 week later, one day before the removal of ECMO. Patient was successfully decannulated, and
weaned off of pressors. Repeated ECHO showed that left ventricle ejection factor was between 50-55% and right ventricle systolic function was moderate to severely decreased.

The rest of the hospital process was uneventful. Vasopressors were slowly weaned to off and patient was downgraded to regular floor. She was discharged three weeks later.

Discussion:

The mortality rate of patients with ARVC is about 3% yearly and is decreased to 1% by medical management [2]. Sudden cardiac death accounts for one-third of deaths, while chronic heart failure is responsible for the remainder [2, 3]. A comprehensive anesthesia plan should be set up before an elective surgery. Pre-surgery medication management is always necessary. The use of an implantable cardioverter-defibrillator is recommended [4]. Communication with cardio-surgery team for invasive cardiopulmonary support is also suitable since patients with ARVC might be relatively unresponsive to regular resuscitation in the setting of myocardial apoptosis [5].

References


