


Wearable cardioverter defibrillator in postpartum patient with cardiomyopathy

Kamizelka defibrylująca w okresie poporodowym u pacjentki z kardiomiopatią

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Abstract

Cardiovascular diseases during pregnancy increase the risk of morbidity and mortality in pregnant women and their children. We present the case of a 37-year-old patient with cardiomyopathy who developed significant deterioration of left ventricular function accompanied by fetal death at 28 gestational week, and who was subsequently provided with a wearable cardioverter defibrillator as a part of sudden cardiac death prevention.

Key words: cardiomyopathy in pregnancy, sudden cardiac death, wearable cardioverter defibrillator

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Introduction

Cardiomyopathies are rare but important causes of cardiovascular complications in pregnant women, resulting in a significant risk of maternal sudden cardiac death (SCD) during and after pregnancy [1, 2]. Pharmacological treatment can improve left ventricular (LV) function and prevent permanent implantation of a cardioverter-defibrillator in some patients [3]. Its implantation is recommended, however, if significantly impaired LV function persists after at least 3 months of optimal pharmacotherapy. SCD risk during this waiting period may be mitigated by an externally worn cardioverter-defibrillator.

Case report

A 37-year-old woman in her fourth pregnancy with concomitant hypertension and anemia was admitted to the Obstetrics Department for suspected fetal demise at 28 gestational week. Formerly, the patient had two natural and one cesarean deliveries and was a smoker with a history of alcohol abuse.

The patient reported myocarditis in 2014 and since that time occasionally took bisoprolol and eplerenone. Prior to and during the pregnancy, the patient worked physically and denied any decrease in exercise tolerance. The patient was referred to the cardiology outpatient

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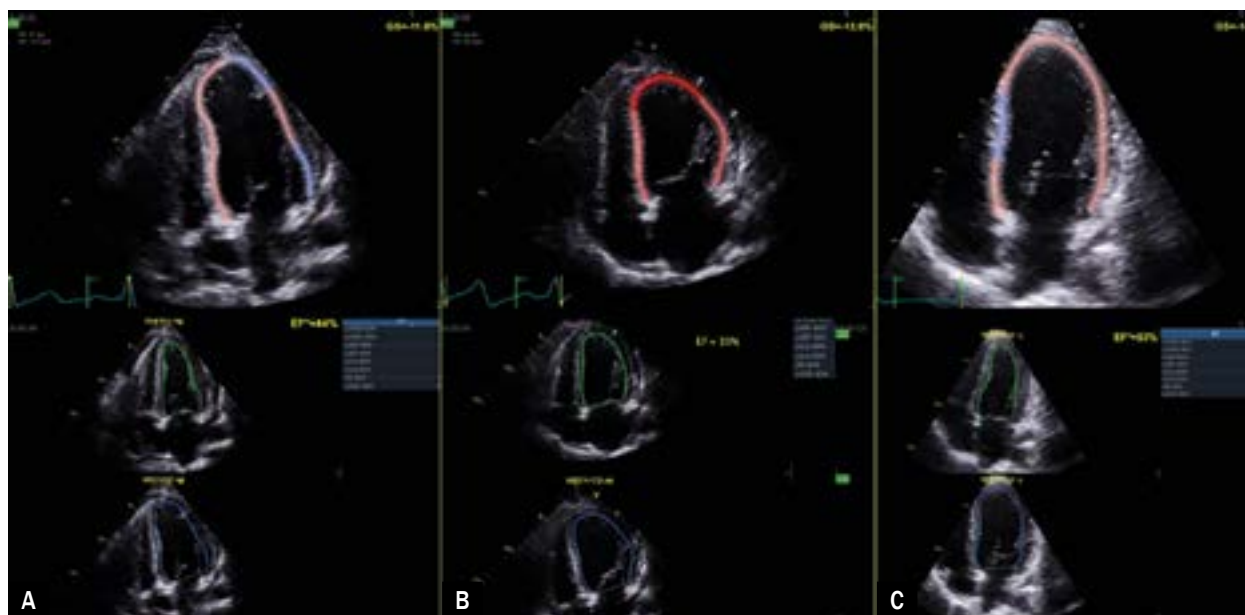


Figure 1. Echocardiography images: **A.** Initial stage: reduced GLS, mildly reduced EF; **B.** Decompensation: decreased GLS, decreased EF, more spherical LV; **C.** Improvement: improved GLS and EF, LV reverse remodeling; EF – ejection fraction; GLS – global longitudinal strain; LV – left ventricle

clinic, where tachycardia yet with no overt signs of heart failure was found. Echocardiogram showed marked LV wall thickening (LV mass index was 177 g/m^2 with norm $< 95 \text{ g/m}^2$) with wall motion abnormalities, ejection fraction (EF) decreased to 44% (with norm $> 50\%$), global longitudinal strain (GLS) reached -11.6% (with norm $< -18\%$) and pericardial effusion (Figure 1A). The diagnosis of cardiomyopathy of unclear etiology was established and metoprolol, methyldopa, and iron preparations were administered. In the 28th gestation week, the patient stopped feeling fetal movements. On ultrasound examination, a lifeless fetus was visualized in the uterine cavity. Echocardiography showed EF of 33% (Figure 1B). A cesarean section with hemodynamic monitoring in the perinatal period was performed. After delivery, full therapy for heart failure was introduced, and contraception was advised. The patient was equipped with an under-clothing wearable cardioverter defibrillator (WCD) vest to protect her from SCD. As EF and GLS improvement was observed 3 months after delivery (Figure 1C) a decision to terminate WCD protection was taken.

Discussion

The risk of cardiovascular complications in pregnant women with cardiovascular diseases depends on the underlying heart disease and is assessed using the modified World Health Organization (mWHO) classification [4]. It distinguishes

four classes of increasing risk, the last of which includes patients at extremely high exposure to death or severe morbidity, in whom pregnancy is contraindicated. Because of impaired LV function, the patient under study remained in mWHO class III, with a significantly increased risk of mortality or severe morbidity.

The decline in LV systolic function around 28 weeks' gestation may have indicated the superimposition of peripartum cardiomyopathy on pre-existing cardiomyopathy of unclear etiology or the progression of the underlying disease. During pregnancy and puerperium, peripartum cardiomyopathy and LV systolic dysfunction of other etiologies pose a high risk of ventricular function deterioration, fetal loss, dangerous ventricular arrhythmias, and sudden cardiac arrest [5]. Because of possible improvement through optimal pharmacotherapy, early implantation of cardioverter-defibrillator is not recommended. A viable option to prevent SCD is to provide the patients with a WCD for the first months after delivery.

Conclusions

Cardiovascular diseases during pregnancy occur infrequently but can lead to severe conditions. The impairment of heart function may, however, be reversible giving hope for avoiding permanent implantation of cardioverter-defibrillator. Temporary use of WCD can provide necessary protection under such circumstances.

Conflict of interest

All authors declare no conflict of interests.

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Streszczenie

Choroby układu sercowo-naczyniowego u kobiet w ciąży zwiększają ryzyko chorobowości i śmiertelności zarówno matek, jak i dzieci. W artykule przedstawiono przypadek 37-letniej pacjentki z kardiomiopatią, u której w 28. tygodniu ciąży doszło do znacznego pogorszenia funkcji lewej komory oraz obumarcia płodu i którą zaopatrzone kamizelką defibrylującą w ramach prewencji nagłego zgonu sercowego.

Słowa kluczowe: kardiomiopatia w ciąży, nagły zgon sercowy, kamizelka defibrylująca

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