Zero-fluoroscopy catheter ablation of focal atrial tachycardia in a pregnant woman with tachycardia induced cardiomyopathy

Klinični primer

Abstract

Introdukcja: Wystąpienie tachykardii może zwiększać się podczas ciąży wraz z zwiększoną nienasyceniem do akcji nieprawidłowej.

Przedstawiamy przykład 30-letniej kobiety w 18. tygodniu ciąży z atrialną tachykardią i tachykardią-indukowaną kardiomiopatią, która została pomyślnie leczona z użyciem technik katheterowej ablationi bez obsekania.

Omówienie: Opisana metoda jest bezpieczna i efektywna i może być używana w przyszłości, gdy tańcem niepoddawane tachykardie występują podczas ciąży.

1. Introduction

It is known that the cardiovascular system undergoes significant potential proarhythmogenic changes in adaptation to pregnancy (1). Thus, occurrence of tachycardias may increase during pregnancy in line with the increased propensity to ectopic activity. When tachycardias become incessant and cannot be controlled with therapeutic interventions there is increased risk for deve-
2. Case presentation

A 30-year-old woman in the 18th week of her first pregnancy was admitted to our department for electrophysiology study. She had a history of atrial tachycardia with tachycardia-induced cardiomyopathy four years before the pregnancy. In the past she was successfully treated with propranolol which was later replaced with bisoprolol. Antiarrhythmic drug treatment was discontinued due to patient preference and improvement of systolic function of the left ventricle. At the beginning of her pregnancy she complained of palpitations, dizziness and nausea. Atrial tachycardia with heart rate of approximately 200 beats per minute (bpm) was recorded on a 12-lead
electrocardiogram (ECG). Systolic dysfunction of the left ventricle was observed on echocardiography (ejection fraction 47%). The resumed treatment with bisoprolol was unsuccessful. Numerous tachycardia episodes with a heart rate of 200 bpm were observed on the 24-hour ECG monitoring, median heart rate was 119 bpm.

Neither fluoroscopy nor sedation were used for the procedure. We performed percutaneous femoral vein puncture and inserted a 10-lead electrophysiology catheter (Polaris X™, Boston Scientific) into the coronary sinus and an irrigated tip ablation catheter (CoolFlex™, St. Jude Medical) was placed into the right atrium. After continuous isoprenaline infusion there was spontaneous occurrence of sustained atrial tachycardia. A 3D – electroanatomic mapping (EAM) model (Ensite/NavX™, St. Jude Medical) with activation mapping of the right atrium was created (Figure 1B). The origin of the focal atrial tachycardia was found on the cranial part of the crista terminalis where radiofrequency ablation was performed with 40 W (Figure 1A). The ablation terminated the tachycardia within 10 seconds, however the effect was only transient as tachycardia recurred a few minutes later. Subsequently, intracardiac echocardiography (ICE) probe (Acunav™, Biosense Webster) was inserted into the right atrium. With the aid of the intracardiac echocardiography the ablation catheter tip was guided into the cranial part of the right atrial appendage ostium at the location opposite to the previous transiently successful ablation site on the crista terminalis. At the described location the ablation with 35W was successful within seconds. Tachycardia did not recur during the 30 minute waiting period despite repeated challenge with isoprenaline and fast atrial pacing (Figure 1D). The patient had no palpitations during the one month follow-up period. 24-hour ECG monitoring revealed no atrial tachycardias and systolic function of the left ventricle improved to near normal.

3. Discussion

Treatment of atrial tachycardias during pregnancy is generally challenging due to their drug-refractory nature and tendency to be persistent. When supraventricular tachycardias can not be controlled with antiarrhythmic drugs, catheter ablation is the treatment of choice (2). This seems particularly true when tachycardia-induced cardiomyopathy is present. However, X-ray exposure during catheter ablation may be potentially harmful for the fetus. For a typical procedure, the calculated average radiation dose to the fetus is < 1 mGy. This poses an estimated risk for the fetus to develop cancer at rates of 14.5, 30 and 55.7 per million cases for first, second and third trimester, respectively. Radiation also increases the estimated risk for hereditary effect in the next generation at rates of 1.5, 3.0 and 5.6 per million cases for first, second and third trimester, respectively (3).

There are few reports of zero and near-zero fluoroscopy catheter ablation for the treatment of focal atrial tachycardia during pregnancy (4,5). In our case, we successfully combined the use of the 3D-EAM system and the ICE to treat focal atrial tachycardia originating from the appendage side of the crista terminalis without the use of fluoroscopy. The described method seems safe and effective and could be used in the same manner in the future when drug refractory tachycardias occur during pregnancy.
The patient gives her consent to the publication of the article.

References


