

ST-segment elevation myocardial infarction in 27-year-old pregnant women

Zawał serca z uniesieniem odcinka ST u 27-letniej kobiety w ciąży

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Abstract

A pregnant woman diagnosed with a myocardial infarction is an extremely rare case in clinical practice. Obesity and nicotine use are well-known risk factors for cardiovascular events that are significant especially in the population of younger women. In this paper, the authors present the case of a 27-year-old woman who suffered an ST-segment elevation myocardial infarction in early pregnancy. Percutaneous coronary intervention constitutes the basis for treatment in such cases. The problem is the optimal adjustment of pharmacotherapy, safety for the developing foetus should also be included in its planning.

Key words: myocardial infarction, STEMI, pregnancy, smoking, obesity

Folia Cardiologica 2020; 15, 5: 355–358

Case report

A 27-year-old obese smoking female patient, who was diagnosed with inferior wall myocardial infarction with ST elevation, was transferred from the hospital emergency department to a haemodynamic laboratory. A few hours before the admission, during a meeting with friends, the patient suddenly felt chest pain, for the first time in her life. The pain gradually decreased over a few dozen minutes. At the time of admission, the patient described it as chest discomfort. The physical examination revealed a regular heart rate of 117/min, blood pressure 140/77 mm Hg, systolic murmur at the apex, class II obesity – body mass index (BMI) 35 kg/m². No family history. The electrocardiography (ECG) revealed sinus tachycardia with a frequency of 119/min, ST-elevation typical of Pardee's sign, by 3 mm in inferior wall leads, and ST depression up to 2.5 mm in the I, aVL, V2–V4 leads (Figure 1).

The patient received 300 mg of acetylsalicylic acid, 180 mg of ticagrelor and 100 mg of enoxaparin. She had

coronary angiography performed immediately, which revealed a peripheral obstruction of the posterolateral branch of the right coronary artery (probably of embolic aetiology) (Figures 2, 3). The patient was qualified for urgent angioplasty of the infarct-related artery. Glycoprotein IIb/IIIa inhibitor (eptifibatide) was included in the treatment; an attempt was made to carry out vessel revascularisation and multiple balloon inflations were performed. As a result, the flow was slightly improved [TIMI (Thrombolysis In Myocardial Infarction) 1].

Laboratory tests showed dynamic changes in the troponin I concentration, determined using the high-sensitivity method (maximum concentration 17,164.4 ng/L), which is typical of infarction, and hyperlipidemia [total cholesterol 195 mg/dL, LDL (low-density lipoprotein)-cholesterol 141 mg/dL]. The normal activity of protein C and S and antithrombin III was observed. The patient also had genetic tests carried out, which did not show any factor V Leiden or prothrombin G20210A mutation or any mutations in both alleles of F2, F5 and MTHFR genes.

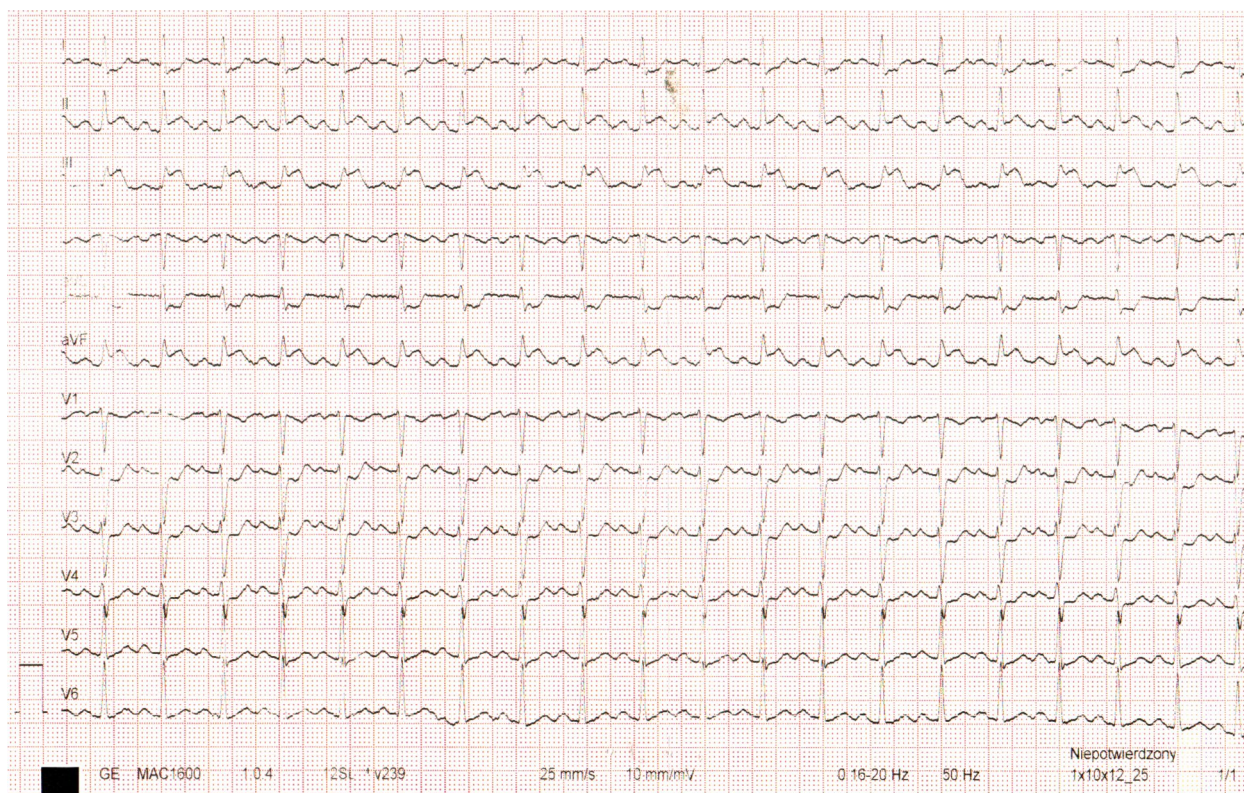


Figure 1. Electrocardiogram (ECG) performed on admission to the clinic

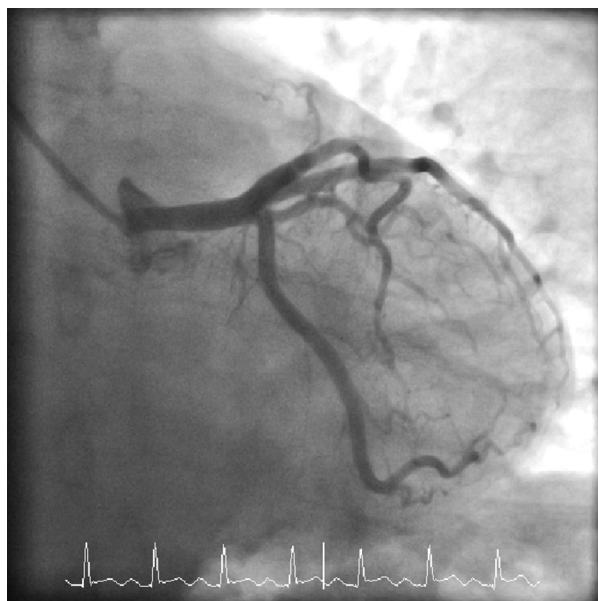


Figure 2. Angiogram of normal left coronary artery

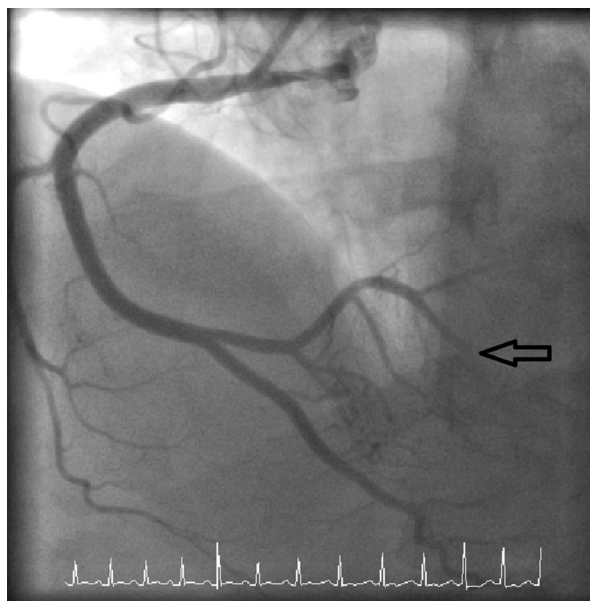


Figure 3. Angiogram of right coronary artery. The arrow indicates the place of obstruction of the posterolateral branch.

Echocardiography revealed hypokinesis of the basal segment of the inferior wall, left ventricular ejection fraction was 55%. Transesophageal echocardiography did not show any obvious signs of the atrial septal defect or embolic material in the left atrial appendage.

No signs of thrombosis in superficial and deep veins in the lower extremities were observed in the Doppler ultrasound. The 48-hour ECG monitoring using the Holter method recorded sinus rhythm with an average frequency of 79/min, without episodes of supraventricular arrhythmia. The

abdominal ultrasound showed no significant deviations. Due to the fact that the patient had missed her period and her suggestion that she could be pregnant, a gynecological ultrasound was performed and confirmed the possibility of early pregnancy. This was also confirmed by a typical increase in the human chorionic gonadotropin (hCG) concentration. Therefore, the therapy was immediately modified and the patient stopped taking statin and ticagrelor.

No complications were observed during the hospitalisation. After the discharge, the patient was treated with enoxaparin in a therapeutic dose, acetylsalicylic acid at a dose of 75 mg and bisoprolol at a dose of 2.5 mg. She gave birth to a healthy female newborn weighing 3,150 g who was delivered by caesarean section performed in the 40th week of pregnancy.

Discussion

Ischemic heart disease is rare in pregnancy (prevalence is between 2.8–6.2 per 100,000 deliveries). However, it is becoming more and more common nowadays because women decide to become mothers at a later age when they already have comorbidities. [1] Coronary heart disease accounts for > 20% of all maternal deaths due to cardiac causes. As far as the aetiology of the disease is concerned, nonatherosclerotic causes dominate, including pregnancy-related spontaneous coronary artery dissection (43%), cases with normal large coronary arteries observed in coronary angiography (18%) and coronary artery thrombosis (17%) [2]. The risk of acute myocardial infarction (AMI) is also increased by some obstetric conditions (pre-eclampsia, thrombophilia, postpartum haemorrhage, blood product transfusion and postpartum infection) [3]. Compared to the older population (over the age of 55), the main risk factors in younger women include smoking and obesity [4]. It was also observed that the V Leiden, prothrombin G20210A gene and MTHFR C667T mutation increases the risk of myocardial infarction and stroke, especially at an early age [5].

Pregnancy-related acute coronary syndrome (ACS)/AMI occurs most frequently in the third trimester [ST-segment

elevation myocardial infarction (STEMI) 25%, non-ST-segment elevation myocardial infarction (NSTEMI) 32%] or in the postpartum period (STEMI 45%, NSTEMI 55%). The clinical picture is the same as in the general population [1]. In case of STEMI, percutaneous coronary intervention (PCI) is preferred. The morbidity and mortality associated with AMI in pregnancy outweighs the potential teratogenic risk of coronary angiography. Although it is important to avoid unnecessary maternal and foetal exposure during pregnancy, this should not discourage doctors from performing recommended life-saving procedures [3, 6]. Young women with STEMI have worse prognosis than young men and they are more often rehospitalised within the next 6 months. This is due to the fact that they do not receive full pharmacological treatment and they are less frequently treated with invasive methods [4]. In pharmacotherapy, small doses of acetylsalicylic acid, beta-blockers and nitrates seem to be safe for the mother and the foetus, whereas angiotensin-converting enzyme inhibitors and statins are contraindicated [2, 7]. Information on the safety of glycoprotein IIb/IIIa inhibitors is derived from individual case reports. The use of those drugs during pregnancy should be limited; if they are administered to a patient in whom the labour begins, caesarean section should be performed to minimise bleeding complications in the child [3, 8].

Conclusions

The treatment of pregnant women with acute myocardial infarction poses a considerable challenge. In case of STEMI, the basic method is percutaneous revascularisation. As far as possible pharmacotherapy is concerned, it is possible to use acetylsalicylic acid, beta-blockers and nitrates, whereas statins and angiotensin-converting enzyme inhibitors are contraindicated. Full pharmacological treatment should be sought in accordance with the existing guidelines to improve prognosis in this group of patients.

Conflict of interest

The authors declare no conflict of interest.

Streszczenie

Kobieta w ciąży z rozpoznaniem zawału serca to przypadek niezwykle rzadki w praktyce klinicznej. Otyłość i nikotynizm są dobrze znanymi czynnikami ryzyka zdarzeń sercowo-naczyniowych, które mają znaczenie zwłaszcza w populacji młodszych kobiet. W pracy omówiono przypadek 27-latkę, którą hospitalizowano z powodu zawału serca z uniesieniem odcinka ST we wczesnej ciąży. Podstawą leczenia w takich przypadkach jest przeskórna interwencja wieńcowa. Problem stanowi optymalne dopasowanie farmakoterapii, a w jej planowaniu należy uwzględnić również bezpieczeństwo dla rozwijającego się płodu.

Słowa kluczowe: zawał serca, STEMI, ciąża, nikotynizm, otyłość

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