Case Report

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Myocardial Infarction in the Postpartum Period

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THE STUDY OBJECTIVE is to present a clinical observation, describe the diagnostics and treatment of acute transmural myocardial infarction in a patient on the 8th day after childbirth.

MATERIAL AND METHODS A 31-year-old patient was hospitalized 3 hours after the onset of the disease on the 8th day after urgent spontaneous delivery at 38-39 weeks of gestation with a clinic of acute myocardial infarction in the intensive care unit. Based on the data of anamnesis, complaints, physical examination, results of instrumental and laboratory examination, the following clinical diagnosis was made: Ischemic heart disease: acute transmural myocardial infarction of the anterior wall, septum and apex of the left ventricle; atherosclerosis of the aorta and coronary arteries. On an emergency basis, the patient underwent coronary angiography, pronounced atherosclerotic changes in the coronary arteries were revealed: acute occlusion of the anterior interventricular artery in the middle third, stenosis of the diagonal branch up to 70% in the orifice, stenosis of the circumflex branch up to 70% in the middle third, extended stenosis up to 79% in the middle third of the right coronary artery.

RESULTS The patient underwent percutaneous coronary intervention (PCI) on a symptom-dependent artery: mechanical recanalization and stenting of the anterior descending artery (ADA) by a drug-eluting stent.

CONCLUSION An increase in the incidence of acute coronary syndrome in pregnant women and postpartum women requires the development of an algorithm for additional examination of late reproductive age patients at the stage of pregnancy planning, in case of identification of possible risk factors for the development of cardiovascular diseases — observation of a cardiologist during pregnancy and in the postpartum period.

Keywords: myocardial infarction, postpartum period, percutaneous coronary intervention

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Conflict of interest Authors declare lack of the conflicts of interests

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ACS – Acute coronary syndrome
IHD – Ischemic heart disease
CVD – Cardiovascular disease
LV – Left ventricle
BMI – Body Mass Index
HR – Heart rate
EF – Ejection fraction
PCI – Percutaneous coronary intervention
ADA – Anterior descending artery

Acute coronary syndrome (ACS) during pregnancy and in the postpartum period remains an extremely urgent problem. Myocardial infarction in the postpartum period was first described by H. Katz in 1922. [1]. However, to date, there is no due alertness of gynecologists and cardiologists regarding development of ACS in young women. In the developed countries, 20% of maternal deaths from cardiovascular diseases are due to ACS [2]. Currently, the incidence of ACS is 6 cases per 100,000 births and, according to forecasts, it will only increase. This trend reflects the growing prevalence of risk factors for the development of cardiovascular diseases among pregnant women (hypertension, obesity, diabetes mellitus, smoking) and the first delivery after 35 years. Mortality among pregnant women with ACS is 5% [3]. Ischemic heart disease (IHD) is a pathological condition characterized by an absolute or relative disruption of myocardial blood supply due to damage to coronary arteries, and proceeds with periods of stable course and exacerbations. ACS is IHD in the acute stage. In ACS, there is a threat of cardiomyocyte death as a result of impaired arterial blood flow and oxygen deficiency, the most common cause of which is atherosclerosis. Data have been obtained on the influence of infectious agents (hepatitis A, B and C viruses, influenza A, HIV, herpes simplex virus, cytomegalovirus), autoimmune diseases, and systemic inflammation processes on the development of the atherosclerotic process [11,12,13]. Traditionally, male sex is referred to as non-modifiable factors of increased risk of developing cardiovascular diseases (CVD), IHD. However, data have been obtained that in the Russian Federation, 30% of women over 30 years of age have IHD [4,5]. Given the characteristic feature of modern reproductive behavior, the birth of the first and subsequent children in late reproductive age, the problem of diagnosing and treating ACS during pregnancy and in the postpartum period becomes even more relevant [6].

In recent years, there has been a trend towards an increase in ACS incidence in pregnant women. Myocardial infarction often occurs in the postpartum period, in the second place in ACS detection rate is the third trimester of pregnancy. The most common cause of ACS during pregnancy and in the postpartum period is spontaneous coronary artery dissection, which is detected in 43% of patients. In contrast to the general population, atherosclerosis is not the most significant cause of ACS in pregnant women and occurs only in 27% of cases. More rare causes of ACS during pregnancy include thrombosis (17%) and a coronary artery spasm (2%) [7,8]. During coronary angiography in pregnant women with ACS, lesions of the anterior descending coronary artery or the trunk of the left coronary artery are most often detected, however, multivessel lesions predominate [9].

The features of ACS in women include atypical clinical manifestations, lower sensitivity and specificity of non-invasive diagnostic tests [9,10]. Given the atypical clinical manifestations of a heart attack (weakness, malaise, numbness in the left arm, discomfort in the chest area, unexpressed pain syndrome with localization of pain in the chest, abdomen, neck, arms) with no medical history of symptoms of a cardiovascular disease, many patients engage in self-medication, do not seek medical attention in a timely manner. This, in turn, is associated with a high risk of complications, including death.

The purpose of this study is to present a clinical case, describe the diagnosis and treatment of acute transmural myocardial infarction in a patient on the 8th day after delivery.

Patient A., 31 years old, was taken by an ambulance to the intensive care unit for patients with myocardial infarction 3 hours after the onset of the disease. The patient was hospitalized on the 8th day after urgent spontaneous delivery at 38-39 weeks of pregnancy with clinical characteristics of acute myocardial infarction of the anterior wall, septum and apex of the left ventricle (LV), complicated by LV failure. The patient complained of pain of a burning nature in the region of the heart, severe weakness. The patient had no medical history, did not control blood pressure, was not observed by a cardiologist. The presence of aggravated heredity (her mother suffered from coronary artery disease) and bad habits (smoking 1 pack of cigarettes per day) was noted.

Given the postpartum period, the patient was observed together with an obstetrician-gynecologist. It was known from the medical history that the onset of menstruation occurred at the age of 12, the menstrual cycle before this pregnancy was regular, discharge was moderate. The patient denied the presence of gynecological diseases. The patient had 2 pregnancies that ended in urgent spontaneous delivery. This pregnancy proceeded without complications, the patient was observed by an obstetrician-gynecologist at the place of residence, twice during pregnancy she was examined by a therapist, no pathology was detected.

The patient had risk factors for the development of cardiovascular diseases: obesity (height 163 cm, weight 80 kg, Body Mass Index (BMI) 30.1, class 1 obesity), smoking, the hereditary factor, previously uncontrolled blood pressure.

The reason for this hospitalization was a sudden onset of chest pain. Upon admission, the patient's condition was severe, due to ACS, LV failure. Level of consciousness: clear consciousness. The skin was pale, moist, the development of subcutaneous fat was excessive, no peripheral edema. In the lungs, breathing was carried out in all sections, dry and moist rales were heard in the lower sections, the saturation was 95% while breathing with atmospheric air.

ECG at admission recorded sinus rhythm with a heart rate (HR) of 95 beats per minute, ST segment elevation in leads V1-V6, aVL, reciprocal ST segment depression in II, III, and aVF, (Fig. 1)

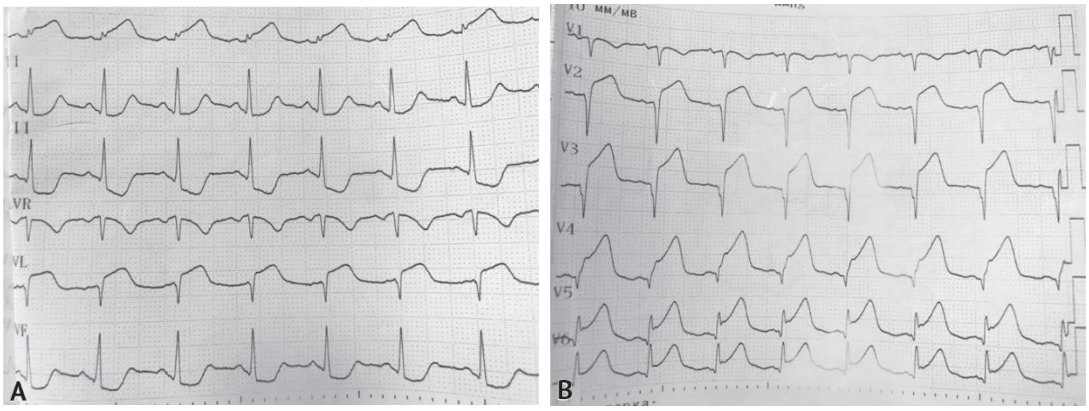

Fig. 1. Electrocardiography upon admission. A — standard leads; B — chest leads

The indicators of clinical, biochemical blood tests, coagulograms, the cardiac enzyme level are presented in Table 1 and Table 2.

Table 1

Clinical, biochemical and coagulological blood test results

Parameter	1st day of treatment
Hemoglobin, g/L	125.0
Red blood cell count, × 1012/L	5.1
Hematocrit, %	39.4
Platelets, ×109/L	320.0
White blood cell count, ×109/L	18.2
Eosinophils, %	0
Basophils, %	1
Lymphocytes, %	5
Monocytes, %	2
Cholesterol, mmol/L	4.81
Triglycerides, mmol/L	1.94
Creatinine, μmol/L	65.4
Urea, mmol/L	3.23
Glucose, mmol/L	6.14
Prothrombin time (Quick method),%	77.1
INR	1.19
aPTT, sec	28.7
D-dimer, mg/L	0.91

Notes: АЧТВ — activated partial prothrombin time; МНО — international normalized ratio

Table 2

Dynamic changes of blood level cardiac specific enzymes

Parameter	1st day of treatment	2nd day of treatment
CPK, U/L	168,5	3763,0
CPK-MB, U/L	32,0	373,1
Troponin, ng/mL	0,09	7,4

Note: КФК МВ — МВ fraction of creatine phosphokinase

Upon admission, according to ECHO-CG results, the LV contractile function was reduced, the ejection fraction (EF) was 40%, hypokinesis of the septal and anteroseptal segments was determined at the average level, hypoakinesis of all apical segments.

Based on the medical history, complaints, physical examination, ECG, ECHO-CG, laboratory examination (increased levels of acute phase enzymes, moderate leukocytosis), a clinical diagnosis was made: Main: IHD: acute transmural myocardial infarction of the anterior wall, septum and apex of the LV. Atherosclerosis of the aorta and coronary arteries.

As a matter of urgency, 90 minutes after hospitalization, the patient underwent coronary angiography which revealed pronounced atherosclerotic changes in the coronary arteries: acute occlusion of the anterior

interventricular artery (AIVA) in the middle third (Fig. 2), diagonal branch stenosis up to 70% in orifice area, circumflex branch stenosis up to 70% in the middle third, extended stenosis up to 79% in the middle third of the right coronary artery.

The patient underwent percutaneous coronary intervention (PCI) on a symptom-dependent artery: mechanical recanalization and stenting of the ADA using a drug-eluting stent (Fig. 3). The control angiograms clearly show that the stent is fully extended, the antegrade blood flow is TIMI grade 3.

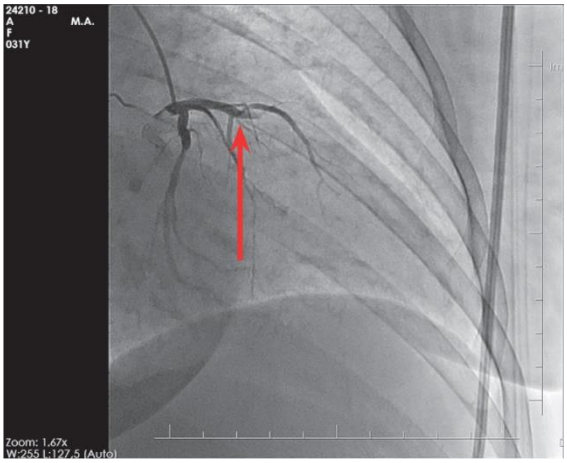

Fig. 2. Acute occlusion of the anterior descending artery

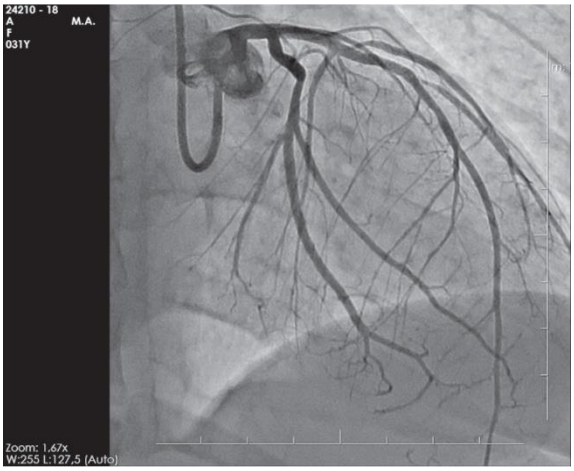

Fig. 3. Stent-assisted mechanical recanalization of the anterior descending artery

On the 6th day of treatment, the patient was transferred to the Cardiology Department. A series of ECGs in the postoperative period recorded sinus rhythm with a heart rate of 70 beats per minute, delayed evolution of anterior transmural myocardial infarction of the LV (Fig. 4).

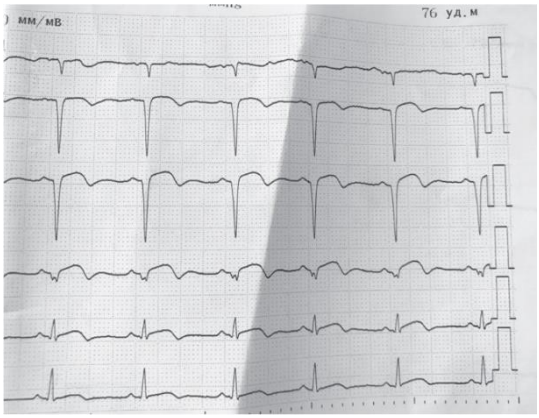

Fig. 4. Delayed evolution of transmural myocardial infarction of the anterior wall and septum of the left ventricle

According to ECHO-CG data, hypoakinesis of the septal and anteroseptal segments was noted in dynamics at the average level, dyskinesia of all apical segments (signs of LV aneurysm), EF was 40%. After PCI, against the background of drug therapy (beta-blockers, statins, ACE inhibitors, antiplatelet therapy), a good clinical effect was achieved: no angina attacks were noted, arrhythmias and conduction disorders were not recorded. During dynamic observation by the obstetrician-gynecologist and ultrasound monitoring of the pelvic organs, no pathology requiring emergency treatment was diagnosed. To suppress lactation on the 2nd day of treatment, cabergoline in a standard dosage was added to the therapy, and a good clinical effect was obtained. On the 14th

day of treatment, the patient in a satisfactory condition was discharged under the supervision of a cardiologist, an obstetrician-gynecologist at the place of residence, dual antiplatelet therapy was recommended.

Over the past decade in Russia, the mortality of hospitalized patients with ACS has significantly decreased, primarily due to the introduction of percutaneous interventions on the coronary arteries within the so-called "golden hour" into standard clinical practice; performing early reperfusion therapy. However, the trend towards an increase in the incidence of ACS in pregnant women and high maternal mortality from this pathology, noted in recent years, suggests the need to revise therapeutic approaches to this group of patients. The presented data once again confirm the opinion that IHD is an urgent problem for young women. The presence of modifiable and non-modifiable risk factors for the development of cardiovascular diseases in late reproductive age patients requires the development of an algorithm for additional examination of patients over 35 years of age at the stage of pregnancy planning, observation by a cardiologist during pregnancy and in the postpartum period.

The demonstration of this clinical case of myocardial infarction of a woman in the late postpartum period indicates the need for an interdisciplinary approach to the observation and treatment of patients of reproductive age with myocardial infarction.

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