

A CLINICAL CASE OF ACUTE CORONARY SYNDROME IN A PATIENT WITH TYPE 2 DIABETES MELLITUS

Shoalimova Z.M.

Associate Professor of The Department Internal Medicine №1
Tashkent Medical Academy, Uzbekistan

Maxmudova M.S.

Senior Lecturer of The Department Internal Medicine №1
Tashkent Medical Academy, Uzbekistan

Nizametdinova U.D.

Assistant of the Department of Propaedeutics of Internal Diseases №1
Tashkent Medical Academy, Uzbekistan

Todjiboev M.S.

Assistant of the Department of Internal Diseases №2 and Endocrinology
Tashkent Medical Academy, Uzbekistan

Axmedova D.

Master's Degree Student of Tashkent Medical Academy, Uzbekistan

Annotation. The article is devoted to the analysis of a clinical case of acute coronary syndrome in a patient with diabetes type 2 diabetes (DM2). The reasons for the progression of atherosclerosis in patients with type 2 diabetes are considered which leads to myocardial ischemia against the background of damage to several coronary arteries and determines the high frequency of restenoses after coronary interventions. Comorbidity of somatic diseases in cardiological practice is one of the important prognostic factors affecting the outcome of the underlying disease. In this regard, the issues of choice of tactics are discussed. hypoglycemic therapy and the additive effect of drugs based on randomized clinical trials.

Keywords: acute myocardial infarction, type 2 diabetes, chronic heart failure, restenosis, insulin resistance, hyperglycemic memory, clopidogrel, beta-blockers, metformin, glimepiride

Patient M., born in 1960, was diagnosed with DM2 and arterial hypertension (AH) in 2018 when blood pressure and blood sugar levels were accidentally measured. The maximum value of blood pressure is 220/110 mm Hg. Art., usual - 140/90 mm Hg. Art. A history of duodenal ulcer, the last exacerbation in 2013. The patient's medical history can be considered in retrospect.

Careful analysis of anamnestic data shows the presence of metabolic syndrome and hypertension. So, 10 years ago, when the patient was still 50-55 years old, he did not have clinically manifested pathological conditions, but there was already a so-called. asymptomatic target organ damage. At the same time, the patient did not receive any antihypertensive or hypoglycemic therapy, and only in 2018 did he start taking Diabeton MB 60 mg and enalapril 10 mg without careful self-monitoring of blood pressure and blood sugar. She has been smoking since the age of 14, and in recent years up to 25-30 cigarettes per day. Since 2019, with high-intensity loads, he began to notice pressing pains behind the sternum, accompanied by a feeling of lack of air, passing after a few minutes of rest. In October 2020 - inpatient treatment at the TMA clinic for Q-non-forming myocardial infarction of the anterior wall of the left ventricle

Revascularization was not performed. After discharge, pressing pains behind the sternum continued to bother, accompanied by a feeling of lack of air at lower loads, corresponding to angina pectoris III functional class (FC). A worsening was noted during the week, when the patient experienced a severe attack of pain behind the sternum, accompanied by a strong feeling of lack of air, which stopped on its own after a few hours. In the future, weakness increased, and tolerance to physical activity decreased. On the night of February 25, 2021, shortness of breath increased with a transition to suffocation against the background of a rise in blood pressure to 220/110 mm Hg. Art. The SMP team diagnosed myocardial infarction in the lower wall of the left ventricle, complicated by pulmonary edema, and the patient was hospitalized in the cardiac

intensive care unit of the TMA clinic. The hospital did not have the equipment to perform interventional treatments for AMI. Survey data. ECG at admission: sinus rhythm, single supraventricular extrasystoles, PQ 180 ms, heart rate 70 per minute. Q and ST elevation up to 3 mm in leads II, III, aVF, false-positive dynamics in the chest leads. Troponin -1.98. Glycosylated hemoglobin (HbA1c) 7.7%. Glycemic profile: 9:00 - 13.2 mmol/l, 13:00 -16.4 mmol/l, 17:00 - 15.0 mmol/l. Blood test: total cholesterol 5.7 mmol/l, LDL 3.7 mmol/l; creatinine 105 μ mol/l (GFR MDRD-61 ml/min/1.73 m²). Echocardiography from 03/03/14 - RV: not dilated, LP 41. LV: TMZhP 10 mm; TZSLZh 13 cm; EF 44%; DAC 4.4 mm; KDR 6.6; TMZHP 1.2; TZS 1.0. Akinesia of the posterior-lower LV segments. X-ray of the chest organs: lung fields without pathological shadows. The pulmonary pattern is moderately enhanced due to pneumosclerosis. The roots are unstructured and heavy. The diaphragm and sinuses are clear, and on the right, there is a pleurodiaphragmatic commissure. The heart is moderately enlarged to the left due to the arch of the left ventricle. The aorta is sealed. Endoscopy: multiple acute erosions of the antrum. Focal antrum-gastritis. Cicatricial deformity of the prepyloric region and pylorus. Daily monitoring of blood pressure - mean SBP 141, mean diastolic blood pressure 82. Systolic hypertension was detected during the day. Daily blood pressure profile - non-dipper. An episode of BP rise to 189/107 at 10:00 am was recorded. During the observation period in the cardiology department of the TMA clinic, the patient had recurrent pain behind the sternum, and shortness of breath with little physical exertion stopped during nitrate therapy. Given the paroxysm of atrial fibrillation, antiarrhythmic therapy with amiodarone was prescribed. It was planned to transfer to another hospital for coronary angiography, however, EGDS revealed multiple erosions up to 2 mm in size, covered with light fibrin. Coronary angiography was delayed. Diagnosis at discharge: coronary artery disease. Atherosclerosis of the aorta and coronary arteries. Post-infarction cardiosclerosis (myocardial infarction of the anterior localization from October 2013), acute myocardial infarction of the lower LV wall with ST-segment elevation from 02/18/21, and pulmonary edema from 02/25/21. Cardiac arrhythmias: paroxysmal atrial fibrillation. Hypertension stage III, stage 3, risk 4. Chronic heart failure, stage II A, III FC with an outcome in FC II according to NYHA. COPD: chronic obstructive bronchitis in the acute stage. Diabetes mellitus type 2, decompensation. Peptic ulcer of the duodenal bulb in remission. Chronic erosive gastritis in the acute stage. The patient was advised to continue taking acetylsalicylic acid + clopidogrel 100/75, bisoprolol 5 mg, amiodarone 200 mg, 1 tablet in the morning, enalapril 5 mg in the morning, indapamide 2.5 mg in the morning, rosuvastatin 20 mg in the evening; pantoprazole 20 mg 2 times a day 30 minutes before meals and Maalox 1 tablet 3 times 2 hours after meals for 15-20 days; glimepiride 4 mg. Because of the need to perform coronary angiography, a control EGDS at the place of residence is recommended in 10-14 days. After discharge, chest discomfort and shortness of breath persisted during normal physical activity, consistent with chronic heart failure (CHF) NYHA FC II. On 04/09/2021, in the laboratory of endovascular diagnostics and treatment of RSCC, the patient underwent coronary angiography on an outpatient basis, which revealed a two-vessel atherosclerotic lesion of the coronary arteries (CA): subtotal stenosis of the middle segment of the anterior descending artery (ADA), stenosis of 80% of the middle segment of the right coronary artery (PCA). Balloon angioplasty and stenting of the AIA and RCA were performed simultaneously with the installation of three drug-eluting stents BioMime 3.0 x 24 mm, BioMime 3.5 x 22 mm, and Resolute Integrity 2.75-18 mm. After successful myocardial revascularization, the patient noted an improvement in well-being in the form of a decrease in dyspnea during physical exertion to CHF I FC according to NYHA. Echocardiography: LV: ESR 3.8 cm, EDR 5.7 cm, TdMZhP 1.1 cm, TdZLZh 1.1 cm, EF 62%, RV 2.4 cm. After discharge, chest pain and shortness of breath did not recur. The patient regularly took acetylsalicylic acid + clopidogrel 100/75-100/75, bisoprolol 5 mg in the morning, enalapril 5 mg per day, indapamide 2.5 mg in the morning, rosuvastatin 20 mg in the evening; glimepiride 2 mg, metformin 500 mg in the morning, 1000 mg in the evening. The patient continued to smoke about 15-20 cigarettes per day. Since January 2022 (9 months after stenting), a worsening condition was observed: shortness of breath during moderate-intensity physical exertion, interruptions in the work of the heart, accompanied by dizziness. In the clinic on the ECG ventricular extrasystole (bi-, trigeminal). With 24-hour Holter ECG monitoring from 02/25/22: sinus rhythm with a heart rate of 42-131 per minute. Ventricular ectopic activity: 4,478 PVCs per day, of which 1,876 single, 2,155 PVCs were included in bigeminy, and 447 paired PVCs. Supraventricular ectopic activity: 937 VZhES per day, including 649 single and 192

paired, 96 groups. Sinus arrhythmia at night. 1 pause for more than 2 s; With RR 3048 ms. Total cholesterol 3.7 mmol/l, LDL cholesterol 2.0 mmol/l, HDL cholesterol 1.05 mmol/l. HbA1c 6.4%. Insulin 5.7 mcU/ml (2.7-10.4). C-peptide 877 pmol/l (260-1730). ACTH 26 PC/ml (less than 46). Cortisol 469 nmol/L (101.2535.7). PSA total 1.2 ng/ml (less than 4). Ferritin 127 mcg/l (20-250).

The patient applied to the specialized cardiology center to determine further management tactics. At the outpatient stage, the electrocardiogram (ECG) showed sinus rhythm with a heart rate of 59 beats/min, focal (scar) damage to the myocardium of the lower localization, signs of diffuse changes in the myocardium against the background of insufficiency of the coronary blood supply (Fig. 1).

Picture 1. Electrocardiogram of the patient



According to the results of stress echocardiography with physical activity on February 16, 2022, stress-induced myocardial ischemia was detected in the RCA and AAD basin (along the lower and anterior walls of the LV myocardium). On 03/02/2022, the patient underwent coronary angiography on an outpatient basis at the specialized cardiology center, the results of which revealed hemodynamically significant stenoses of the proximal segments of the ACA and RCA (Fig. 2).

Figure 2. Angiograms of the right coronary artery (RCA). Areas of maximum stenosis are indicated by an arrow.



Angiograms of the right coronary artery (RCA) after balloon angioplasty with stenting.

After an endovascular intervention, the patient noted an improvement in well-being, and the ECG returned to the original. Data for focal myocardial damage was not received. However, the patient continued to report persistent dyspnea during high-intensity exercise, which resolved on its own at rest within a few minutes. This was due to the presence of hemodynamically significant stenosis of the proximal segment of the AAD.

After revascularization, the patient noted an improvement in health, shortness of breath, and anginal pain did not bother, and no rhythm disturbances were recorded on the ECG. 24-hour Holter ECG monitoring was performed on March 18-19, 2022 (after PCI while taking metoprolol succinate 100 mg/day). The main rhythm is sinus. Average heart rate 64 per minute, maximum heart rate 90 per minute, minimum heart rate 46 per minute. No significant ST segment abnormalities were found. Ventricular ectopic activity: 2,905 PVCs per day, of which 1,629 single, 1,180 PVCs were included in bigeminy, and 48 paired PVCs.

Supraventricular ectopic activity: 62 NZhES per day, of which 58 were single and 2 were paired. Pauses were registered in the amount of 315. The maximum pause lasted 2 s at 04:26 (pauses of post-extrasystolic genesis).

Analyzing this clinical case, one should pay attention to many points. Social - until February 2014, the patient's lifestyle was not aimed at disease prevention and health promotion. Not observed: regular measurement of blood pressure, giving up bad habits (smoking); monitoring of chronic diseases (history of duodenal ulcer, and EGD revealed multiple erosions of the antrum of the stomach); control of laboratory blood parameters (sugar level (HbA1c 7.7%), cholesterol (total cholesterol 5.7 mmol / l, LDL 3.7)); timely seeking medical help in case of pressing pains behind the sternum, accompanied by a feeling of lack of air during physical exertion (they bothered our patient for two years). An important point for everyday practice is failure to comply with medical recommendations and taking recommended drugs without careful self-monitoring of blood pressure (BP 220/110 mm Hg) and blood sugar (9:00 - 13.2 mmol / l, 13:00 - 16.4 mmol/l, 17:00 - 15.0 mmol/l). The outdated concept of DM treatment "the lower the sugar, the better" was replaced by a new one: "the sooner the better", suggesting timely and as early as possible treatment with an emphasis on initial combination therapy - antihypertensive, hypolipidemic, hypoglycemic. This approach is justified from the position of the theory of the so-called. hyperglycemic memory, which indicates the development of morphological changes during the period of long-term decompensation of diabetes, triggering irreversible processes in the development of complications of this disease.

Since 2022, the patient began to notice pressing pains behind the sternum during high-intensity loads, accompanied by a feeling of lack of air, passing after a few minutes of rest. IHD and CHF remained without timely treatment and developed into AMI complicated by pulmonary edema. In clinical practice, patients

with ACS are hospitalized in the cardiac intensive care unit with complaints of pain behind the sternum or in the left side of the chest, suffocation, or a combination of these complaints. In patients with type 2 diabetes, the feeling of lack of air often comes to the fore, so shortness of breath during physical exertion should be regarded as the equivalent of angina pectoris, and suffocation, for which patients are hospitalized in cardiac intensive care, in most cases is a manifestation of AMI and is accompanied by an increase in cardio specific enzymes [9], which and took place in our case. At the time of admission to the hospital, the patient suffered from CHF with an ejection fraction of 44%. Decompensation of DM draws attention - glycosylated hemoglobin: 7.7; glycemic profile 9:00 - 13.2 mmol / l, 13:00 - 16.4 mmol / l, 17:00 - 15.0 mmol / l. Lipid profile indicators: cholesterol 3.7 mmol/l, LDL 2.0 mmol/l. The patient continued to smoke 15-20 cigarettes per day. It should be recalled that over the past two decades, according to the results of randomized trials with statins [37], in international and Russian recommendations, the target levels of LDL-C for patients with coronary artery disease have been decreasing, and at present, for patients with coronary artery disease, the target lipid levels are: total cholesterol $\leq 4, 0$ mmol/l, LDL-C ≤ 1.8 mmol/l [38]. Carried out at the end of the 20th century. Studies have shown that continued smoking after coronary artery bypass surgery doubles the relative risk of death, recurrent angina, and non-fatal myocardial infarction. The risk of developing the first, as well as the re-development of MI, decreases after smoking cessation. Smoking cessation significantly reduces the risk of CHD progression [39]. Subsequently, smoking cessation was shown to be almost as effective as combination drug therapy [40]. This suggests that the effectiveness of lifestyle changes significantly complements the effectiveness of combined drug therapy. Patients with type 2 diabetes represent a high-risk group for developing coronary artery disease and other CVDs. Due to the chronic course of metabolic disorders in patients with type 2 diabetes, progression of atherosclerosis is observed, which leads to myocardial ischemia against the background of damage to several coronary arteries and determines the high frequency of restenoses after PCI. The comorbidity of somatic diseases in cardiology practice is one of the important prognostic factors affecting the outcome of the underlying disease. It is expected that by summing up the effects of the above drug methods, a beneficial effect can be achieved. The additive effect of medicinal substances is a type of synergy in which the effect of the action of jointly used medicinal substances is equal to the sum of the effects of the action of each substance separately.

REFERENCES

1. Kakorin S.V., Erlich A.D., Kalinkina A.A. Impaired carbohydrate exchange in patients with acute coronary syndrome (register of acute coronary syndrome of Moscow). VII All-Russian Forum «Urgent Cardiology 2014: From Science to Practice». 26-27 November 2014, Moscow. Theses. P. 54.
2. Kurochkina O.N., Spassky A.A., Khokhlov A.L. Course of myocardial infarction from the standpoint of gender differences: results of a retrospective study. Women's health issues. 2012. 7, 3.
3. World Diabetes Day [Electronic Resource]: Server of the Ministry of Health of the Russian Federation. M., 2014.
4. King P, Peacock I, Donnelly R. The UK Prospective Diabetes Study (UKPDS): clinical and therapeutic implications for type 2 Diabetes British journal of clinical pharmacology. 1999. 48, 5. 643-648.
5. Colhoun HM, Betteridge DJ, Durrington PN, et al. Primary prevention of cardiovascular disease with atorvastatin in type 2 diabetes in the Collaborative Atorvastatin Diabetes Study (CARDS): a multicentre randomized placebo-controlled trial. Lancet 2004; 364: 685-696.
6. Demidova T. Atherosclerosis and Diabetes Mellitus 2: mechanisms and control. Cardiosomatics. 2011. 2. 2. 22-30.
7. Mammadov M.N., Chepurina N.A. Total cardiovascular risk: from theory to practice. Under ed. Academician RAMN R. G Oganova. M., 2007. P. 13-14.
8. Biryukova E.V. Clinical case: patient with diabetes type 2. Consiliummedicum, 2013, 15, 4, 34-39.
9. Kakorin S.V., Round L.B., Mkrtumyan A.M. Conservative therapy of acute coronary syndrome in patients with diabetes type 2. Diabetes mellitus. 2013, 2. 43-51.

10. Feeding S.V. From classical diabetic neuropathy therapy to solving the problem of hyperglycemic memory. Effective pharmacotherapy. 2012. 1. Endocrinology. 48-52.
11. Gurevich M.A. Features of pathogenesis and treatment of ischaemic heart disease, heart failure and arterial hypertension in patients with diabetes mellitus. *Klinic. Medicine*. 2005. 1. 4-9.
12. Levina L.I., Shapovalova A.B. Diabetes mellitus and ischemic heart disease. *Doctor. Vedomosti*. 2005. 3. 33-37.
13. Favaro E, Miceli I, Bussolati B, Schimitt-Ney M. Hyperglycemia Induces Apoptosis of Human Pancreatic Islet Endothelial Cells *Am. J. Pathol.* 2008. 173(2). 442-450.
14. Fang ZY, Prins JB, Marwick TH. Diabetic Cardiomyopathy: Evidence, Mechanisms, and Therapeutic Implications. *Endocr. Rev.* 2004, 25 (4), 543-567.
15. MacDonald MR, Petrie MC, Hawkins NM, et al. Diabetes left ventricular systolic dysfunction and chronic heart failure. *Eur. Heart J.* 2008, 29 (10), 1224-1240.
16. Cayla G, Silvain J, O'Connor SA, et al. Current antiplatelet options for NSTEMI-ACS patients *QJM*. 2012. 72-76.
17. Kessler C, Thomas K, Kao J. Antiplatelet therapy for secondary prevention of acute coronary syndrome, transient ischemic attack, and non-cardioembolic stroke in an era of cost containment *J. Investig. Med.* 2012. 60, 5. 792-800.
18. Anderson JL, Adams CD, Antman EM, et al. American College of Cardiology; American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction); American College of Emergency Physicians; Society for Cardiovascular Angiography and Interventions; Society of Thoracic Surgeons; American Association of Cardiovascular and Pulmonary Rehabilitation; Society for Academic Emergency Medicine. ACC/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-Elevation myocardial infarction: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction) developed in collaboration with the American College of Emergency Physicians, the Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine *J. Am. Coll. Cardiol.* 2007. 50, 7. 1-157.
19. Boggan R, van Staa T, Timmis A et al. Clopidogrel discontinuation after acute coronary syndromes: frequency, predictors, and associations with death and myocardial infarction - a hospital registry - primary care linked cohort (MINAP-GPRD). *Eur Heart J* 2011; 32: 2376-86.
20. Eisenberg MJ, Richard PR, Libersan D, Filion KB. Safety of Short-Term Discontinuation of Antiplatelet Therapy in Patients With Drug-Eluting Stents. *Circulation* 2009; 119: 1634-42.