

Case Report

A clinical case of a young patient with post-myocarditis atrial fibrillation and heart failure with reduced ejection fraction

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ABSTRACT

A clinical observation of a 26-year-old patient with post-myocarditis atrial fibrillation and heart failure (HF) with reduced left ventricular ejection fraction (LVEF) is presented. In February 2025 the patient suffered from acute myocarditis, diagnosed based on magnetic resonance imaging. The outcome was post-myocarditis cardiomyopathy complicated by HF with LVEF 28%, followed by hospitalization in a cardiology hospital. During treatment, quadruple therapy (angiotensin receptor and neprilysin inhibitor, beta-blocker, mineralocorticoid receptor antagonist, sodium-glucose cotransporter type 2 inhibitor) was initiated and sinus rhythm was restored by electrical cardioversion. This therapeutic approach resulted in significant improvements, including a regression of congestive symptoms, a natriuretic peptide level from 2530 to 267 pg/ml, and an increase in LVEF from 28% to 65%. This clinical case highlights the complexity of not only the timely diagnosis of myocarditis but also the treatment of its consequences.

Keywords: Myocarditis, Atrial fibrillation, Heart failure with reduced ejection fraction, Echocardiography, Quadruple therapy

INTRODUCTION

Myocarditis is defined as inflammation of heart myocardium due to numerous causes. Apart from all etiologies viral myocarditis is most abundant in all age groups.¹ Initial clinical presentation may manifest chest pain, shortness of breath, fatigue and history of a recent upper respiratory infection. Above mentioned symptoms are highly typical for range of diseases, which simply lead to difficulties in diagnosing myocarditis.²

Clinical symptoms and electrocardiography (ECG) findings may be suggestive of a broad number of cardiac diseases.³ Clinical course can be unpredictable as some of the patients might not need any sort of treatment and on the other hand some patients might even require heart transplantation due to severe heart failure (HF).⁴ Tachy- and bradyarrhythmias are also possible complications in the acute stage.¹

Echocardiographic results depend and vary on the duration of the disease and onset.⁵ Low left ventricular ejection fraction (LVEF) could possibly result due to virus associated myocarditis.⁶ Echocardiography must be performed in myocarditis patients to exclude and evaluate cardiac function deterioration. And it is the finest non-invasive method used to observe the course of disease.^{7,8} Cardiac troponin I levels are useful in diagnosing myocarditis but it is not a specific finding.⁹ To more accurately identify areas of inflammation and its causes, magnetic resonance imaging (MRI) with paramagnetic contrast has been actively used in recent years.¹

Patients must continue HF treatment despite the LVEF being increased to more than 40% to reduce possible deterioration of cardiac function.¹¹

CASE REPORT

During the annual medical check-up, a 26-year-old patient's ECG showed tachysystolic form of AF. His

previous ECG which was done one year ago demonstrated sinus rhythm without any structural or electric abnormalities. Chest X-ray revealed no pathological changes. Clinically he presented with complaints on poor exercise tolerance, shortness of breath when walking and fatigue which appeared after severe common cold, he had one month before. For 4 days he had fever up to 39°C, dry cough, runny nose and general weakness. He didn't take any antibacterial therapy or performed any laboratory or instrumental examinations.

He has been smoking for approximately 10 years, no past surgical history and no history of blood transfusions.

On 14 April 2025 patient was admitted for additional examination and treatment to the Grodno Clinical Cardiological Centre (Belarus).

During initial examination he was in a satisfactory state with complaints on dyspnea at physical exertion, palpitations and fatigue. His heart rate was irregular and increased to 97 b.p.m. His blood pressure was 105/80 mmHg. On percussion there was noticeable heart dilatation to the left with muffled heart sounds and a murmur heard along the left edge of sternum. Moist rales were heard in the lower lobes of both lungs.

Patient's diagnosis upon admission was: cardiomyopathy of mixed origin (post-inflammatory, arrhythmogenic) Persistent form of AF, tachysystolic variant, of unknown duration, first diagnosed on 27 March 2025. Bilateral hydrothorax. Hydropericardium. HF NYHA functional class III.

ECG at admission showed AF with average heart rate of 92 b.p.m (Figure 1). Also, ECG demonstrated signs of left ventricular hypertrophy and T-wave inversion in all precordial leads.

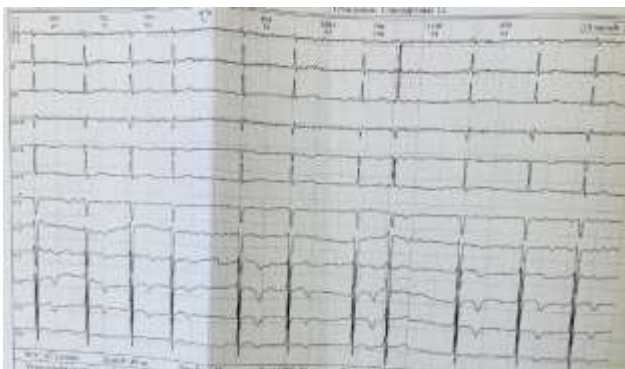


Figure 1: Patient's ECG at admission.

Patient's laboratory parameters were within normal ranges, except for coagulation test values, which were slightly increased, including INR, APTT and prothrombin time. Patient's high-sensitive troponin at admission was not increased (<0.10 ng/ml, normal values 0.0-0.30 ng/ml).

However, patient's NT-proBNP was significantly increased (2530 pg/ml), identifying HF progression.

On 04 September 2025, patient underwent a transthoracic echocardiography. It demonstrated dilation of all heart chambers with significant decrease of function of left ventricle (LV). Left atrium diameter in the 4-chamber position - 46/59 mm. Right atrium diameter in the 4-chamber position - 47/57 mm. LV sizes in M-mode: end-diastolic diameter - 67 mm, end-systolic diameter - 58 mm. LV volumes: end-diastolic volume in M-mode - 236 ml, in B-mode - 195 ml; end-systolic volume in M-mode - 169 ml, B-mode - 142 ml; left ventricular ejection fraction (LVEF) in M-mode - 28%, in B-mode - 27%; Patient also had mitral valve insufficiency (regurgitation grades 2-3) and tricuspid valve insufficiency (regurgitation grade 2). Pulmonary hypertension (stage 1) 44 mmHg was detected. Signs of bilateral hydrothorax (25 mm layer in the left pleural cavity and 30 mm layer in the right pleural cavity) and hydropericardium (80 ml) were also present.

Patient underwent gastroscopy, which demonstrated signs of erythematous petechial gastropathy in the acute stage.

Patients treatment at admission included standard quadruple therapy of HFrEF, including sacubitril/valsartan 24/26 mg 1/2 tab 2 times per day, spironolactone 25 mg 1 tab 1 time per day, metoprolol 25 mg 1 tab 2 times per day, and empagliflozin 10 mg 1 tab 1 time per day.

Also, patient's therapy included amiodarone 200 mg 1 tab 2 times a day and rivaroxaban 20 mg 1 tab 1 time per day for the prophylaxis of embolization. Erythematous gastropathy was treated with pantoprazole 20 mg 1 tab 1 time per day.

Taking into the account duration of AF less than one year, progressing HFrEF and the sufficient period of anticoagulation therapy the decision was made to restore sinus rhythm by performing electrical cardioversion. Patient gave his written consent to the procedure.

On 04 October 2025, the patient underwent transesophageal echocardiography. No thrombi were found in the heart chambers. Patent foramen ovale (diameter 1.5 mm) was detected, which was located in the middle third of the interatrial septum with slight shunting of blood from left to right.

Electrical cardioversion was performed by a biphasic defibrillator under intravenous sedation of propofol 200 mg fractionally. After one 200 J shock sinus rhythm was restored, with heart rate 68 b.p.m., blood pressure 102/58 mmHg, respiratory rate 14/min, SpO₂-100%.

The next day patient's Holter monitoring was performed (Figures 2a and b). Main rhythm during the day was sinus, with long periods of atrial rhythm. Average heart rate at daytime was 67 b.p.m., at night time – 62 b.p.m. There were 6 ventricular extrasystoles and 25 supraventricular

extrasystoles. No significant ST segment dynamics were detected.

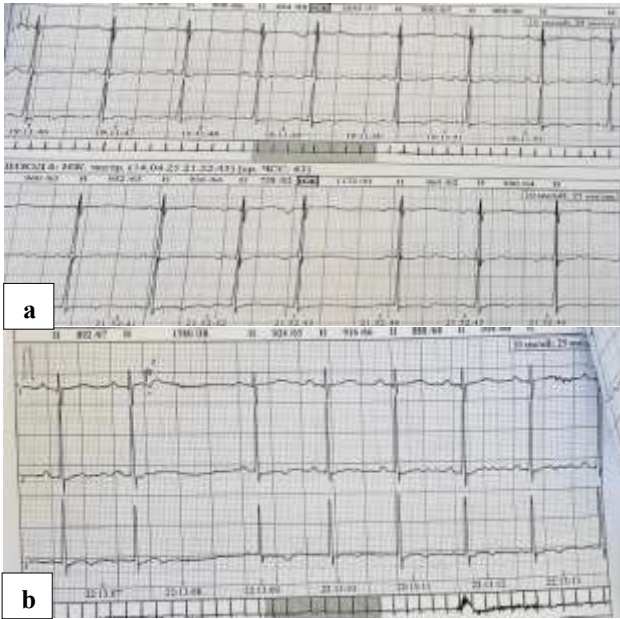


Figure 2: Extracts from patient's Holter monitor (a) supraventricular extrasystole, and b) blocked supraventricular extrasystole.

On 14 April 2025 patient was discharged in satisfactory condition. ECG at discharge demonstrated sinus rhythm with heart rate 61 b.p.m. Signs of left ventricular hypertrophy and T-wave inversion in all precordial leads persisted (Figure 3).

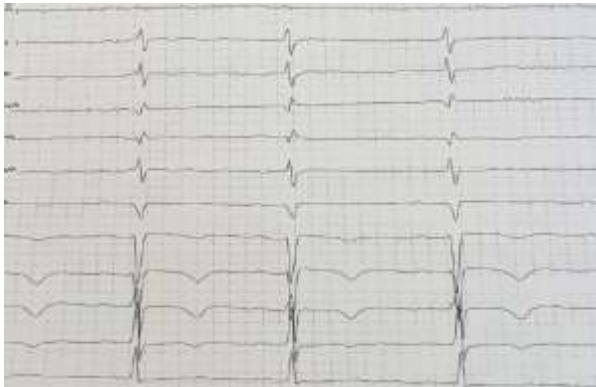


Figure 3: Patient's ECG upon discharge.

The final diagnosis of the patient was as follows.

Severe form of acute myocarditis (March 2025). Mitral insufficiency stage 2-3, tricuspid insufficiency stage 2, aortic insufficiency stage 1. Pulmonary hypertension stage 1. Patent foramen ovale (diameter 1.5 mm). Persistent form of AF, tachysystolic variant, first diagnosed on 03/27/2025. Sinus rhythm from 04/14/2025 (electrical cardioversion). Supraventricular extrasystoles. HF with reduced ejection fraction (LVEF 27/28%). NYHA

functional class III. Bilateral hydrothorax. Hydropericardium. Erythematous petechial gastropathy.

Recommendations were given for lifestyle and diet modification, limited animal fat and salt intake, treatment of foci of chronic infection, and limitation of physical exertion.

Recommended drug therapy included: rivaroxaban 20 mg 1 tablet once a day during meals, with monitoring for signs of bleeding (CHA2DS2-VASc – 1 point; HAS-BLED- 0 points); sacubitril/valsartan 24/26 mg 1/2 tablets twice a day, with blood pressure monitoring, titration to the maximum tolerated dose; metoprolol 25 mg 1/2 tablets twice a day, with heart rate of at least 55 b.p.m. at rest; spironolactone 25 mg 1 tablet once a day, under the monitoring of potassium, urea, and creatinine; amiodarone 200 mg 1 tablet twice a day for 5 days, then 1 tablet once a day in the morning for 3-4 weeks, followed by discontinuation; empagliflozin 10 mg 1 tablet once a day; and pantoprazole 20 mg, 1 tablet in the morning 20 minutes before meals for 2-3 weeks, then in courses during the fall and spring.

Also, patient was advised to perform cardiac MRI and repeat echocardiography in 3 months followed by a consultation with a cardiologist to evaluate prognosis and effectiveness of treatment strategies.

On 14 May 2025, patient underwent cardiac MRI with 15 ml of gadolinium-containing contrast. A small intramyocardial area of fibrosis in the LV myocardium, possibly of post-inflammatory origin was revealed. Signs of LV dilation were found (LV dimensions in the 4-chamber projection: 5.4×6.2 cm, left atrium – no data), LV contractility was not reduced. There were no signs of fluid in pericardium and pleural cavities.

On 18 July 2025 the patient visited the Grodno Regional Clinical Cardiology Center for a health checkup. He had no complaints; his heart rate was regular (67 b.p.m.) and his blood pressure was 110/60 mmHg. He had no peripheral edema. Patient's ECG revealed sinus rhythm with heart rate 70 b.p.m.

His echocardiogram revealed visible improvement in systolic function (LVEF – 65%), and reduction in the size of both ventricles and atria. The dynamics of the echocardiography parameters is presented in Table 1.

Patient's NT-proBNP also returned to normal levels (267 pg/ml). His CBC, coagulation tests and basic metabolic panel were within reference values (Table 2).

Follow up: with drug therapy, a significant clinical improvement in the patient's condition was noted: exercise tolerance increased, and NYHA functional class improved from III to II. Over the past 3 months, comprehensive conservative therapy for this young patient with post-myocarditis cardiosclerosis and HF has alleviated the

severity of symptoms, contributed to an increase in LVEF from 27% to 65%, and a decrease in NT-proBNP levels from 2530 to 267 pg/ml. The good tolerability and safety profile of the drugs further improved the patient's adherence to therapy.

Table 1: The dynamics of the echocardiography parameters within 3 months of treatment.

Echocardiography parameters	Base-line	3 months after treatment
Diastolic LV diameter, mm	67	55
Systolic LV diameter, mm	58	45
LV end-diastolic volume, ml	195	152
LV end-systolic volume, ml	142	53
LVEF (%), biplane	27	65
Left atrial diameter, mm	46×59	44×54
Right atrial diameter, mm	47×57	42×54
Right ventricle diameter, mm	30	27

Table 2: The dynamics of the basic metabolic panel parameters within 3 months of treatment.

Basic metabolic panel parameters	Base-line	3 months after treatment	Reference values
Urea, mmol/l	3	4.4	2.2-7.5
Creatinine, mmol/l	106	87.3	62-124
Potassium, mmol/l	4.3	4,8	3.5-5.5
Sodium, mmol/l	139	141	135-150
Glucose (fasting), mmol/l	4.5	5.1	3.3-5.9
C-reactive protein, mg/l	0.7	0.2	0-6

DISCUSSION

Post-viral myocarditis is a recognized serious complication in young adults recovering from a viral infection, which can result in cardiac complications like arrhythmias and early onset HF.^{12,13} As our patient has a history of viral infection prior to myocarditis it is highly suggestive of post viral myocarditis. But myocardial biopsy was not done and the patient was managed conservatively without etiological treatment.

As viral myocarditis is so abundant, most of the time specific treatment is not required. Due to that supportive management plus treatment of each complication like HF and arrhythmias usually done. Fatal conditions might require ICU facilities.⁸ Based on guidelines of European Society of Cardiology HF management carried out by quadruple therapy as angiotensin converting enzyme inhibitors or angiotensin receptor neprilysin inhibitors,

sodium glucose co-transporter type 2 inhibitors, beta-blockers and mineralocorticoid receptor antagonists.¹⁰

In our case myocarditis was complicated with both HF and AF, which was managed successfully with rhythm control strategy. As the LVEF was severely reduced, the patient was managed by quadruple therapy. However, patient responded well to the management strategies. The patient was discharged in a satisfactory state and was followed up on multiple occasions to assess condition.

CONCLUSION

The presented clinical observation of a young patient testifies to the objective difficulties not only of timely diagnosis of myocarditis, but also of treatment of its consequences including HF rEF and AF. The authors believe that this observation may be useful for physicians in various specialties, including general practitioners, and cardiologists, who may encounter the development of cardiac symptoms in young patients after an infectious disease.

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Ethical approval: Not required

REFERENCES

- Lima MR, Custódio P, Tralhão A, Trabulo M. Case report: acute myocarditis complicated with persistent complete heart block: a clinical dilemma when myocardial inflammation remains. *Eur Heart J Case Rep.* 2024;8(4):ytae152.
- Nguyen J, Benites C, Karpel D, Akram M, Concepcion L. Acute Viral Myocarditis in a Young Adult: A Case Report. *Cureus.* 2024;16(8):e66325.
- Rottmann FA, Glück C, Kaier K, Bemtgen X, Supady A, von Zur Mühlen C, et al. Myocarditis incidence and hospital mortality from 2007 to 2022: insights from a nationwide registry. *Clin Res Cardiol.* 2025;114(9):1156-63.
- Oster ME, Shay DK, Su JR, Gee J, Creech CB, Broder KR, et al. Myocarditis Cases Reported After mRNA-Based COVID-19 Vaccination in the US From December 2020 to August 2021. *JAMA.* 2022;327(4):331-40.
- Brown J, Rashid H, Sarva ST, Tatapudi S, Kalathoor J, Srinivasan A, et al. Case Report: Three cases of clinically suspected viral myocarditis with recovery of left ventricular dysfunction. *Front Cardiovasc Med.* 2024;11:1345449.
- Rabat SK, Manzoor U, Ijaz N, Aloysius MM. A Case Report on an Underappreciated Cause of Heart Failure: Chronic Viral Myocarditis. *Cureus.* 2022;14(7):e27253.
- Chabior A, Tymińska A, Pawlak A, Giordani A, Caforio A, Grabowski M, et al. Advances in myocarditis management in the light of the latest

- research and recent guidelines of the European Society of Cardiology. *Cardiol J.* 2024;31(2):342-51.
8. Lampejo T, Durkin SM, Bhatt N, Guttman O. Acute myocarditis: aetiology, diagnosis and management. *Clin Med (Lond).* 2021;21(5):e505-10.
 9. Wu L, Ji W, Huang Y, Zeng H, Chen J, Zou Y, et al. Establishment and validation of a prediction model for myocarditis in Chinese children below 14 years old: a protocol for a retrospective cohort study. *BMJ Open.* 2023;13(12):e075453.
 10. Caforio AL, Pankuweit S, Arbustini E, Basso C, Gimeno-Blanes J, Felix SB, et al; European Society of Cardiology Working Group on Myocardial and Pericardial Diseases. Current state of knowledge on aetiology, diagnosis, management, and therapy of myocarditis: a position statement of the European Society of Cardiology Working Group on Myocardial and Pericardial Diseases. *Eur Heart J.* 2013;34(33):2636-48.
 11. Chabior A, Tymińska A, Pawlak A, Giordani A, Caforio A, Grabowski M, et al. Advances in myocarditis management in the light of the latest research and recent guidelines of the European Society of Cardiology. *Cardiol J.* 2024;31(2):342-51.
 12. Ammirati E, Cartella I, Varrenti M, Selimi A, Sormani P, Garascia A, et al. Acute myocarditis: 2024 state of the art. *Eur Heart J Suppl.* 2025;27(Suppl 1):i56-60.
 13. Nguyen J, Benites C, Karpel D, Akram M, Concepcion L. Acute Viral Myocarditis in a Young Adult: A Case Report. *Cureus.* 2024;16(8):e66325.

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