

Myocardial infarction with simultaneous acute stroke in a patient with prior aortic graft replacement – what is the origin of the embolic incident?

Zawał serca współistniejący z udarem mózgu po wszczepieniu protezy aorty wstępującej z powodu ostrego rozwarstwienia typu A – jakie jest źródło materiału zatorowego?

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Abstract

Myocardial infarction as a reflection of advanced coronary artery disease is often associated with atherosclerosis of other arteries, especially renal, peripheral and carotid, resulting in chronic renal disease, peripheral artery disease, or stroke. Nevertheless, atherosclerosis is not always the only cause of those diseases. In this article, was presented the case of a patient with myocardial infarction and concomitant stroke probably caused by percutaneous coronary intervention.

Key words: myocardial infarction, stroke, embolic incident

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Case report

A 62 year-old male patient with a history of cigarette smoking, hypertension, acute ascending aortic dissection repaired with graft replacement of the ascending aorta and resuspension of incompetent aortic valve six months previously (computed tomography of coronary arteries executed then revealed no signs of coronary artery disease), with symptoms of typical resting chest pain radiating to left upper extremities was admitted to the Intensive Cardiac Therapy Clinic in the fourteenth hour of acute coronary syndrome – myocardial infarction with inferior ST segment elevation concomitant with newly registered left bundle branch block.

On admission, the patient was conscious [Glasgow Coma Scale (GCS) 10, E3V3M4] haemodynamically stable, with persistent chest pain, abnormal speech, left-side facial drop, and left-side hemiparesis. ECG showed a maximum 2 mm ST-segment elevation in leads II, III, aVF, and a 1.5 mm ST-segment depression in leads I, aVL, V2–V6. During the recording of the ECG, left bundle branch block occurred. The patient was transferred immediately to the cardiac catheterisation lab for urgent coronary angiography which revealed isolated critical stenosis of the right coronary artery with coexisting thrombus blocking the entire artery (Figure 1). At the beginning of the procedure, a thrombectomy was performed (Figure 2). A percutaneous intervention was conducted with successful sirolimus eluting stent



Figure 1. Critical stenosis of the right coronary artery with coexisting thrombus

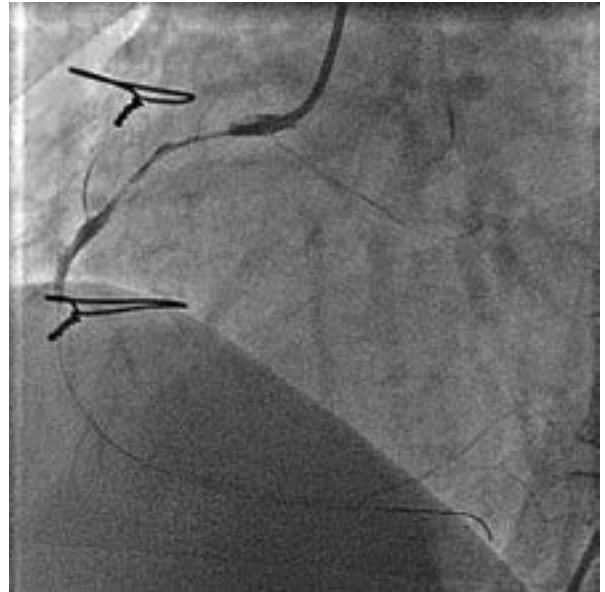


Figure 2. Right coronary artery thrombectomy

implantation to right coronary artery with intracoronary and subsequent intravenous eptifibatid ejection. Due to his neurological state, the patient was transferred to the radiology department in order to perform a computed tomography of the brain. This procedure revealed no signs of intracranial bleeding with slightly increased density of the left middle cerebral artery. The patient was consulted by a neurologist and disqualified from thrombolysis with recombinant tissue plasminogen activator due to previous heparin administration. Over the following period of observation the state of the patient gradually started to stabilise, and his overall neurological condition improved, with only the paresis of the left upper extremities (4/5 according to Lovett) remaining.

Echocardiography revealed concentric hypertrophy of the left ventricle with regional wall motion abnormalities in both the inferior wall and the basal inferolateral segment as well as the right ventricular free wall. Ejection fraction was assessed using the modified Simpsons method to be 49%. In addition, the examination showed severe tricuspid insufficiency with mild pulmonary hypertension [systolic pulmonary artery pressure (SPAP) 32 mm Hg].

In order to detect the cause of the stroke, a transoesophageal echocardiography was performed. This revealed a patent foramen ovale, with residual left-to-right shunt at rest with no change of the blood flow direction during the Valsalva manoeuvre. An aortic graft implanted six months previously due to acute ascending aorta dissection showed no signs of additional masses.

Taking all the results into consideration, the most likely cause of the stroke concomitant to acute myocardial

infarction in this patient was distribution of the thrombus origins from the aortic graft to the right coronary artery and cerebral artery.

The patient was discharged home on the seventh day of hospitalisation in optimal health status, with a recommendation for regular ambulatory cardiological and neurological check-ups.

Discussion

Atherosclerosis is a disease affecting all types of arteries and causing different types of conditions based on its localisation. The clinical presentation of this state in the area of the coronary arteries is coronary disease, which is the most common cause of myocardial infarction. Therefore, according to the third universal definition of myocardial infarction, not all types of acute coronary syndromes are caused by atherosclerotic disease [1].

Type 2 of acute coronary syndrome is secondary to ischaemic imbalance in comparison with type 1 which is a spontaneous myocardial infarction. Type 2 includes such causes as, for example, coronary artery spasm, anaemia and coronary embolism. The remaining types pertain to myocardial infarction resulting in death before cardiac biomarkers were obtained (type 3), infarction secondary to percutaneous intervention (type 4a), stent thrombosis (type 4b) and artery bypass grafting (type 5).

There are multiple potential origins of thrombus in the cardiovascular system, most of them related to ageing of the organism which include gradual dysfunction of vessels, arrhythmias, and diseases with prothrombotic profile of the

blood. In young patients, we often search for anatomical structures which predispose to an ischaemic episode secondary to a thrombotic one.

Nevertheless, an increasing number of patients acquire different types of prosthetic devices such as stents and grafts implanted into vessels due to numerous health conditions [2]. Those foreign bodies are more likely to induce a thrombotic reaction to thrombotic events such as myocardial infarction or ischaemic stroke [3].

There are many difficulties associated with such a coexistence of diseases [4]. In view of the clinical status of the patient, there is no easy way of deciding which type of procedure or treatment should be employed first [5].

There are reports concerning such cases in which there is one question recurring – what type of treatment should be introduced? By this we mean which disease takes priority and as a result which treatment course should precede, remembering that choosing treatment of one thrombosed vascular bed delays the management of the other territory [6, 7].

Due to multiple variables, this decision is always multi-faceted and is based on the current situation, focusing on the clinical presentation, aggravation of symptoms, and accessible diagnostic methods [8].

In our case, taking into consideration the ECG image and recurring chest pain, we decided to refer the patient for primary percutaneous coronary intervention. After finding a thrombus in the right coronary artery, the patient was administered eptifibatide. There are numerous studies covering a novel course of treatment for patients with stroke administered another platelet glycoprotein IIb/IIIa inhibitor intravenously [9, 10].

Conclusion

There are no guidelines for the management of a patient with concomitant acute coronary syndrome and stroke, so the treatment decision must always be individualised. A constant evaluation of patient state and ongoing changes remains crucial for the eventual outcome.

Streszczenie

Zawał serca jako odzwierciedlenie zaawansowanej miażdżycy tętnic wieńcowych często współistnieje z miażdżycą innych tętnic, zwłaszcza nerkowych, obwodowych i szyjnych, które objawia się odpowiednio przewlekłą chorobą nerek, chorobą tętnic obwodowych oraz udarem mózgu. Niemniej nie zawsze miażdżycą jest przyczyną powyższych stanów chorobowych. W niniejszej pracy zaprezentowano przypadek pacjenta z ostrym zespołem wieńcowym – zawałem serca i współistniejącym udarem mózgu najprawdopodobniej wtórnie do interwencji w obrębie tętnic wieńcowych.

Słowa kluczowe: ostry zespół wieńcowy, udar mózgu, incydent zakrzepowo-zatorowy

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