

VENTRICULAR FIBRILLATION IN ACUTE MYOCARDIAL INFARCTION - CASE REPORT

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Sudden cardiac death poses an immense problem in the middle and highly developed countries because its first expression is at the same time the last one. Ventricle tachycardia, the monomorphous and the polymorphous ones, and ventricular fibrillation are rhythm disorders that are most frequently associated with the phenomenon of sudden cardiac death. Ventricular fibrillation is the most common cause of sudden cardiac death within the first hours of the acute myocardial infarction.

A 60-year-old man was admitted to our Clinic from a local hospital due to acute onset of chest pain and ECG signs of anterior ST segment elevation myocardial infarction. He had severe rhythm disturbances, about 70 episodes of ventricular fibrillation (VF). Due to rhythmical instability of the patient, we decided that along with PCI it was necessary to implant ICD twenty-two days after the first acute coronary event.

The ICD implantation ensures the best prevention against sudden cardiac death (secondary and primary) in selected high-risk patients and has no alternative for any medicine known so far. It is significant that, lately, the field of application has extended to indication areas of primary prevention of sudden cardiac death, and especially to development of resynchronization implantable cardioverter defibrillator in the heart failure therapy. *Acta Medica Medianae 2009;48(3):43-46.*

Key words: acute myocardial infarction, ventricular fibrillation, implantable cardioverter defibrillator (ICD)

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Introduction

Sudden cardiac death poses an immense problem in the middle and highly developed countries because its first expression is at the same time the last one. Death as a result of cardiac arrest, in general population, is clearly associated with risk factors which are precisely recognized and defined. These factors can be acted upon preventively. A large number of studies has confirmed that malign arrhythmias are direct causes of death. Arrhythmias that are possible causes of death are mainly from the group of ventricle arrhythmias (1). Ventricle tachycardia, the monomorphous and the polymorphous ones, and ventricular fibrillation are rhythm disorders which are most frequently associated with the phenomenon of sudden cardiac death. Etiology of the heart rhythm disorder can be associated with the fundamental cardiac disease, but it can be idiopathic as well.

Acute myocardial infarctions are frequently followed by different rhythm disorders as its most frequent complications. Ventricular fibrillation is the most common cause of sudden cardiac death within the first hours of acute myocardial infarction. It occurs most frequently within the first hour or the first 24 hours and it is called the primary fibrillation. In the recent years, with organisation of coronary units, where with help of the ECG monitoring, heart rhythm of patients can be followed, rhythm disorders can quickly and adequately be treated; hospital mortality is reduced to below 15% (2). Similar trend is registred by using LOOP recorder in follow-up of patients with unexplained syncope (3).

Case report

A 60-year-old man was admitted to our Clinic due to an acute onset of chest pain and ECG signs of anterior ST segment elevation myocardial infarction. The first coronary event occurred 15 days before and the patient had received fibrinolytic therapy (Streptokinase 1.5 mil. IJ along with another medicaments, enoxaparine, clopidogrel, aspirine). He had severe rhythm disturbances, about 70 episodes of ventricular fibrillation (VF) (Fig.1).



Figure 1.

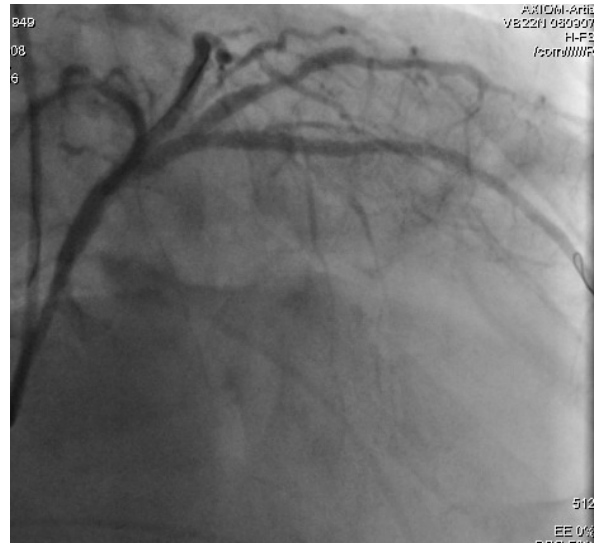


Figure 3.

The patient had a prior history of hypertension and hypercholesterolemia, without history of previous chest discomfort. EF was 25%. During hospitalization, the patient had 31 episodes of VF. Electrocardiogram showed > 2mm ST elevation in leads V1-V6, and it was decided to proceed to cath lab.

The procedure was initiated with diagnostic angiography, with temporary pacemaker, which revealed stenosis of proximal left anterior descending artery (LAD) 99%, and proximal stenosis of ramus branch (RI) 99% (Fig.2)

PCI procedure: JL guiding catheter 6FR was engaged in the LCA. The lesion on RI was predilated with the Sprinter (Medtronic) balloon 2.25x12 mm at 16atm. Tsunami gold 2.5x25 mm at 16 atm were implanted in the proximal part of RI with excellent angiographic result. Then, the lesion on LAD was predilated with the Sprinter 2.25x20 mm at 16 atm, and Cypher Select 3.0x28 mm at 16 atm were implanted in the proximal part of LAD, with excellent angiographic result (Figure 3).

After PCI procedure, the patient had two episodes of VF, and six days after the PCI it was decided to implant ICD (Atlas II DR+, S Jude Medical, with atrial lead Isoflex 1642 T and ventricular lead RIATA 1570) (Figure 4).

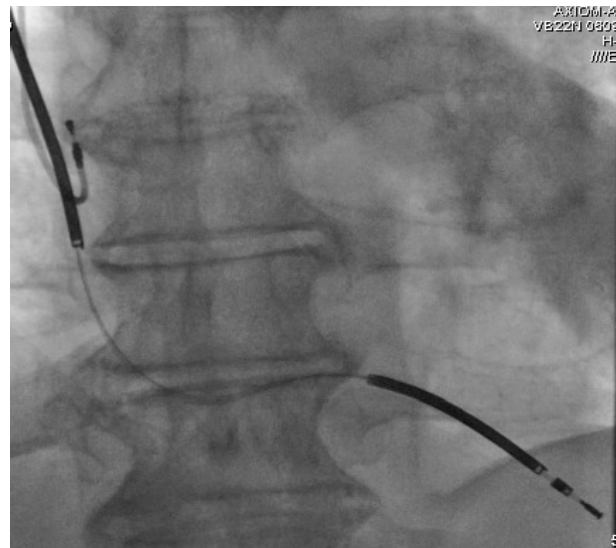


Figure 4.

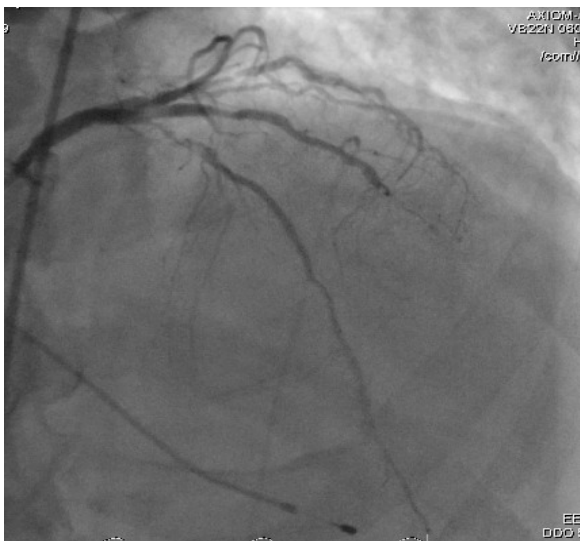


Figure 2.

Discussion

Primary ventricular fibrillation is the most frequent cause of sudden cardiac death during myocardial infarction. It is most frequent within the first hour following the myocardial infarction after which its frequency gradually reduces. Within the first four hours, 80% of all ventricular fibrillations in the acute myocardial infarction occur. Epidemiological data show that frequency of primary fibrillation has been significantly reduced, most likely due to the correction of electrolytic disorders, due to therapeutic measures for reduction of infarction magnitude as well as the use of B blockers (4).

Unlike primary ventricular fibrillation caused by the myocardial ischemia, ventricular

fibrillation caused by extensive necrosis, severe heart insufficiency, cardiogenous shock or aneurism is called the secondary ventricular fibrillation, and occurs after 48 hours and has poor prognosis. Mortality of these patients within the period of one year is 85%, whereas mortality of patients with the primary ventricular fibrillation within the same period is 15%. Ventricular fibrillation is the most frequent cause of sudden cardiac death in outpatients before they even reach hospital. Application of all reanimation measures, including the application of defibrillator, is indispensable because this rhythm disorder is treated by defibrillation (5).

During hospitalization, ventricular fibrillation occurs in 5-10% of inpatients with acute myocardial infarction. Despite extensive researches, a reliable method of predicting its occurrence as well as a method of prevention have not been discovered. Suggested arrhythmia classification which should point to risk of its occurrence, the so-called warning arrhythmias, has not shown desired sensitivity and specificity. Prophylactic application of lidocaine, in one meta-analysis, has shown reduction of ventricular fibrillation frequency but, at the same time, increase in mortality, likely due to frequent asystoles. Therefore, prophylactic application of lidocaine in routine practice is not recommended (6).

Implantable cardioverter defibrillators (ICD) are devices devised primarily to conduct the therapy for life-threatening heart rhythm disorders (7).

The first big randomized multicentric study that has shown advantages of the ICD over arrhythmics (Amiodarone and Sotalol) compared to mortality in patients with documented VT and VF was the AVID study. Results of the AVID study have shown that there had been a 38% reduction of mortality within the first year in the group of patients treated by ICD compared with the group treated by arrhythmics (8). The MADIT II study has shown absolute reduction in mortality in a group of patients having suffered infarction and dysfunction of the left ventricle (EF less than 30%) and who had the ICD implanted compared to a group of patients receiving conventional therapy (9).

The ICD implantation ensures the best prevention against sudden cardiac death (secondary and primary) in selected high-risk patients and has no alternative for any medicine known so far. It is significant that, lately, the field of application has extended to indication areas of primary prevention of sudden cardiac death, and especially to development of resynchronization implantable cardioverter defibrillator in the heart failure therapy (10,11).

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VENTRIKULARNA FIBRILACIJA U AKUTNOM INFARKTU MIOKARDA. PRIKAZ BOLESNIKA

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Iznenadna srčana smrt predstavlja izuzetno veliki problem u srednje i visoko razvijenim zemljama, jer je često njena prva ekspresija istovremeno i poslednja. Komorska tahikardija, monomorfnu ili polimorfna, ventrikularna fibrilacija su poremećaji ritma koji su najčešće povezani sa fenomenom iznenadne srčane smrti. Ventrikularna fibrilacija je najčešći uzrok nagle srčane smrti prvih sati akutnog infarkta miokarda.

60 godišnji P.N. je primljen u našu kliniku iz lokalne bolnice, sa jakim bolovima u grudima i znacima akutnog infarkta miokarda prednjeg zida (elevacija ST segmenta u prekordijalnim odvodima). Bolesnik je imao teške poremećaje srčanog ritma, oko 70 epizoda ventrikularne fibrilacije. Zbog električne nestabilnosti bolesnika odlučili smo da je uz PCI proceduru neophodno bolesniku ugraditi i ICD 22 dana nakon prvog koronarnog događaja.

Implantacija ICD osigurava najbolju prevenciju iznenadne srčane smrti, sekundarnu i primarnu, i nema alternativu niti u jednom od danas poznatih lekova kod selektiranih bolesnika sa povišenim rizikom. Značajno je da se u poslednje vreme polje primene proširilo i na indikaciona područja primarne prevencije iznenadne srčane smrti, a posebno i razvoj resinhronizacionog implantabilnog kardioverter defibrilatora u terapiji srčane slabosti. *Acta Medica Medianae 2009; 48(3):*

Ključne reči: akutni infarkt miokarda, ventrikularna fibrilacija, implantabilni kardioverter defibrilator (ICD)