

Electrical storm in a patient with an implanted ICD as the first sign of cardiac device-related endocarditis

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Abstract

The invention of implantable cardioverter-defibrillator (ICD) devices has been of great use for many patients needing correction of even the most life-threatening cardiac arrhythmias, although many complications are associated with their implantation or function. Electrical storm is characterized by the occurrence of three or more ventricular tachyarrhythmias which require electrotherapy within 24 hours. It occurs in about 10% to 20% of patients with ICD used for secondary

prevention of sudden cardiac death, while when implanted for primary prevention its incidence is about 4%. It is linked with a high mortality risk and increased rate of hospitalization, but it also can be a crucial symptom of lead-dependent infective endocarditis (LDIE). Management includes ablation, pharmacotherapy and reprogramming of the ICD.

CASE REPORT

A 72-year-old patient with heart failure with reduced left ventricle ejection fraction and with previous lead-dependent infective endocarditis (LDIE) treated with transvenous lead removal with an implantable cardioverter-defibrillator (ICD) experienced electrical storm. The patient was admitted to hospital and qualified for an ablation of the origin of ventricular tachycardia. During the hospitalization the patient was also diagnosed with lead-dependent infective endocarditis (LDIE) on the basis of the presence of large vegetations observed in transesophageal echocardiography and positive blood cultures. Due to the dimensions of the vegetations (4 cm x 1.5 cm) he

was qualified for whole system removal with subsequent subcutaneous ICD implantation with concomitant typical antibiotic therapy.

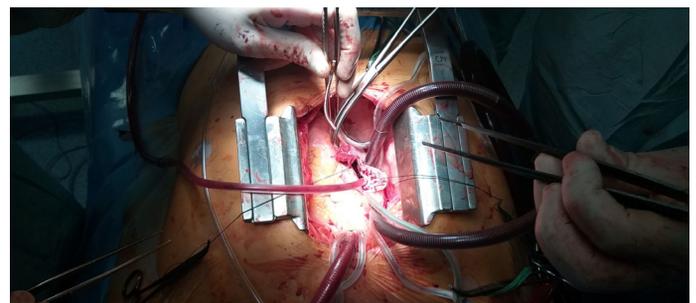


Figure 1. Intrasurgical view of the vegetations.

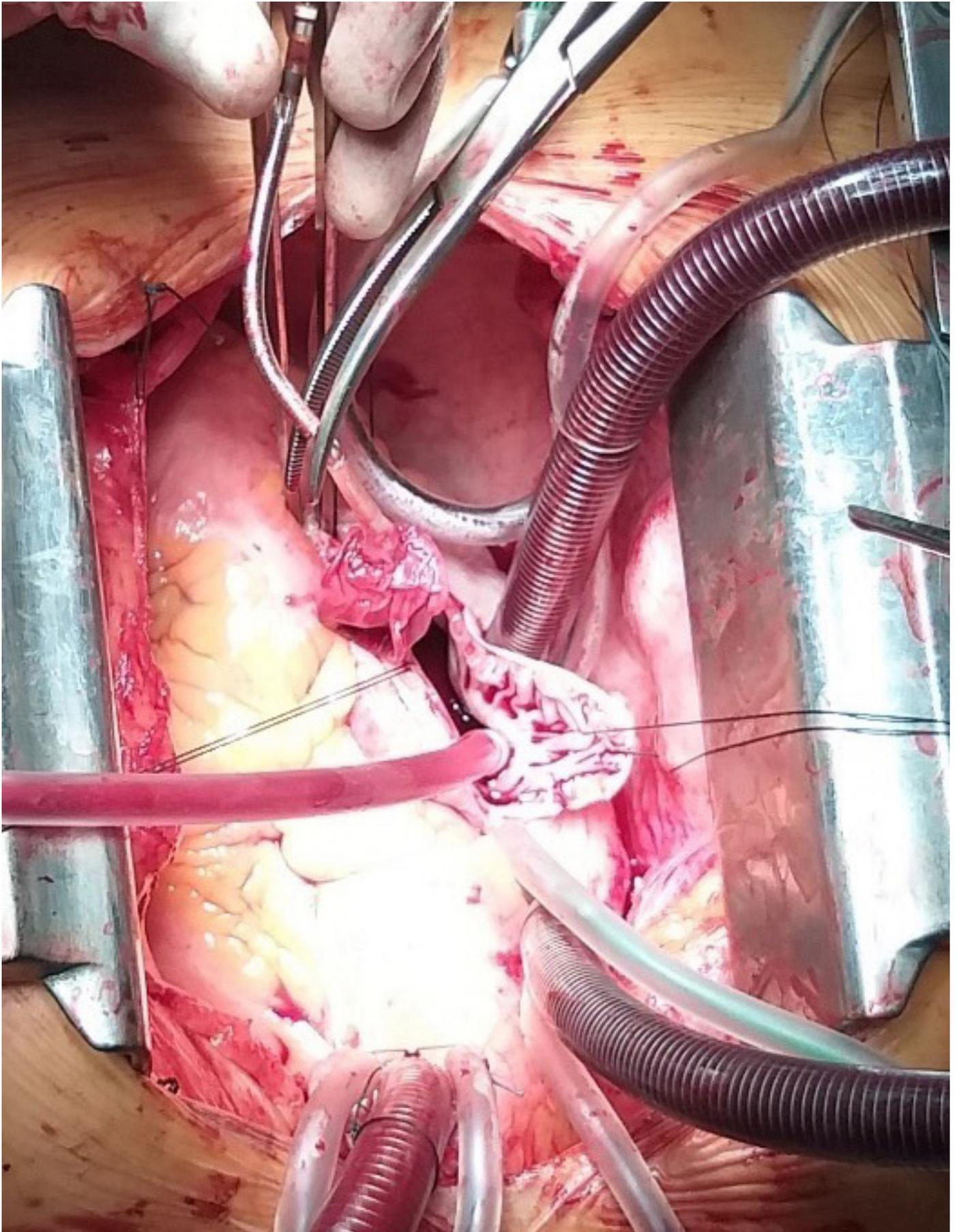


Figure 2. Intrasurgical view of the vegetations – a close-up.

DISCUSSION

Although its definition is under ongoing debate, electrical storm is characterized by the occurrence of three or more ventricular tachyarrhythmias which require electrotherapy within 24 hours. Its incidence is about 10% to 20% in patients with an ICD used for secondary prevention of sudden cardiac death, while when implanted for primary prevention its incidence seems to be lower – about 4%. Electrical storm may occur during acute myocardial infarction, during chronic coronary syndrome, in the course of an inherited arrhythmic syndrome or as the result of a structural heart disease.^[1-3]

It was found that electrical storm has a high mortality risk in a meta-analysis of 13 studies.^[4] The risk is even higher in the case of primary prevention compared to secondary prevention.^[5] It also increases the rate of hospitalization of ICD patients and may strongly affect their quality of life.^[1]

Management of an electrical storm includes ablation as the best method of treatment, pharmacotherapy and reprogramming of the ICD.^[3]

Our case sparks a debate whether electrical storm could be a crucial symptom of LDIE and whether previous history of LDIE and removal of a cardiac device due to it could be a predictor that with another implanted device it could recur. On the other hand, electrical storm could also be just a random convergence – we believe that more studies including case reports^[6] on this topic should be conducted.

Also more aspects should be taken into consideration when following with an implantation of a cardiac device – whether the patient has a high chance of developing endocarditis due to inadequate oral care, past history of endocarditis or having experienced an electrical storm event.

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