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Case report

TIMING OF THE DELAYED CARDIAC REIMPLANTATION IN CIED INFECTION: A CASE REPORT

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ABSTRACT

ICD implantation, such as other surgical procedures, was not free from complications, first of all infection's development. This complication often induces partial or complete device extraction, followed by a re-implantation. Re-implantation timing is modulated depending on the resolution of the infection and presence or absence of a spontaneous cardiac rhythm. A 62 years old patient was treated with CIED implantation after a diagnosis of atrioventricular cardiac conduction alteration. Healthcare workers diagnosed a pocket infection about a month after implantation and performed a device complete extraction, without programming a re-implantation because of a pro-inflammatory state. He died from acute arrhythmia fourteen days after the device extraction. Recent guidelines deal with therapeutic approaches' disputes, indicating a two weeks waiting before the ICD re-implantation in case of infection, not providing any indication in patients with alteration of pro-inflammatory parameters. Further studies are awaited to deal with disputes of appropriate therapeutic approaches' timing and implement future guidelines.

1. Introduction

The increasingly ageing population in combination with application of technological innovations in the medical field resulted in an extensive use of cardiac implantable electronic devices (CIED) [1]. These devices allowed arrhythmias and heart failure treatment, a constant rhythm monitoring and prevention of sudden cardiac arrest. [2].

Especially the younger subjects only suffering from rhythm disorders benefited considerably from implantable cardiac devices (ICD), because of a life expectancy increasing.

ICD implantation, such as other surgical procedures, was not free from complications, first of all infection's development. This complication often induces partial or complete device extraction, followed by a re-implantation. The device extraction can expose patients to the risk of fatal arrhythmias. Timing of device extraction and reimplantation is fundamental in order to prevent a systemic infection and onset of fatal arrhythmias.

After a complete device extraction secondary to pocket and/or lead device infection, re-implantation timing is modulated depending on the resolution of the infection and presence or absence of a spontaneous cardiac rhythm.

If spontaneous cardiac rhythm is absent after device extraction, re-implantation is, in fact, immediately performed in pacemaker-dependent patients.

Guidelines recommend a waiting time of 14 days before the next implantation. The delayed surgical extraction, workable only in case of a spontaneous cardiac rhythm with a normal heart rate, reduces the infection rate [3].

2. Case report

A 63 years old man suffering from chronic ischemic cardiac disease, heart failure, chronic kidney disease, polidistrectual arteriopathy, diabetes mellitus, hypoparathyroidism was admitted to hospital.

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Healthcare workers decided for CIED implantation after a diagnosis of atrioventricular cardiac conduction alteration, characterized by bradyarrhythmias, tachyarrhythmias and lipothymia episodes.

Healthcare workers diagnosed a pocket infection about a month after implantation. Microbiological examination of pocket device established a methicillin-resistant Staphylococcus Aureus (MRSA) and Klebsiella Pneumoniae infection (polymicrobial infection). Healthcare professionals performed a device complete extraction, without programming a re-implantation because of a proinflammatory state. He was monitored regularly in the following days: electrocardiogram (ECG) showed a persistent atrial fibrillation and bradycardia. He died from acute arrhythmia fourteen days after the device extraction.

Autoptic findings showed coronary artery bypass grafts in anterior and posterior interventricular branches.

The histological findings highlighted a marked acute suppurative transmural inflammation of the tricuspid valve (acute infective endocarditis); acute and chronic granulocytic infiltration and bacterial colonies of gram-positive cocci arranged in clusters were observed in pocket device. Multiple outbreaks of fibrosis and myofibrillolysis were observed in cardiac tissue.

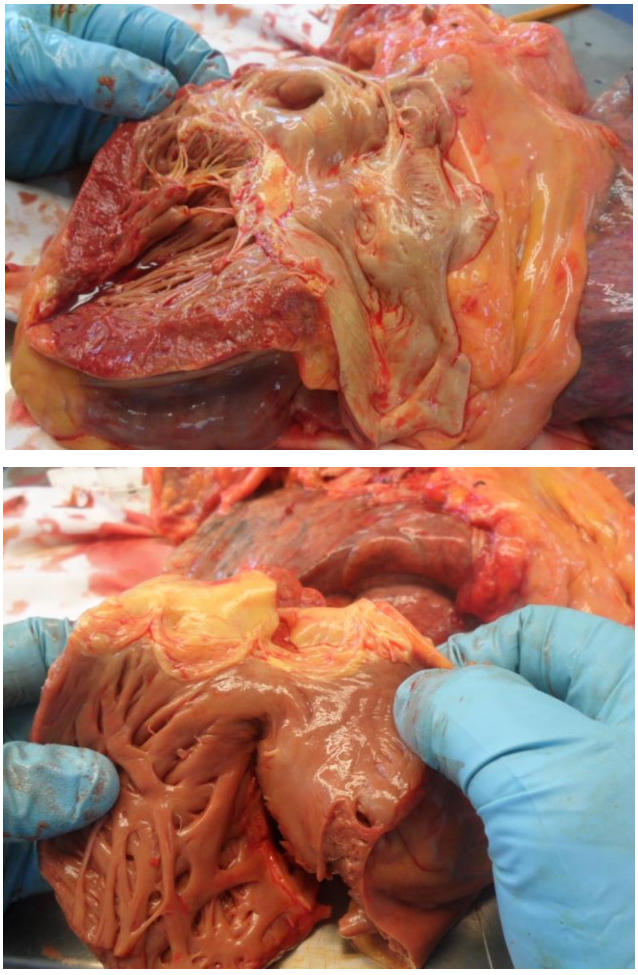

Figure 1 a (up) and b (down). Ventricular chamber

3. Discussion

Nosocomial infections represent a modern challenge for healthcare workers, especially in critical patients, such as those with ICD [4]. Recent guidelines deal with therapeutic approaches' disputes, indicating a two weeks waiting before the ICD re-implantation, in order to prevent the re-infection and then surgical treatment failure.

These guidelines do not provide any indication of the therapeutic approach in a patient with alteration of proinflammatory parameters, such as leukocytosis, high levels of C-reactive protein, thrombocytopenia, erythrocytopenia, increased creatinine levels, and low hemoglobin count [5].

The alteration of proinflammatory parameters suggested a precautionary approach before surgical procedures in this case.

Today there are still a few literature studies concerning the appropriate therapeutic approach in case of a proinflammatory state or the relationship between a proinflammatory state and infection. Some studies, on the other hand, highlighted a statistically significant relationship between alteration of proinflammatory parameters and a poor prognosis; the authors of these studies demonstrated a statically significant association between leukocytosis and right ventricular failure development as well as thrombocytopenia/high RDW value and heart failure [6].

Healthcare workers decided for a conservative approach waiting for normalization of haematological parameters, in the present case. An episode of arrhythmia, occurred in the 14th day, led to the patient's death. Device re-implantation could avoid death, despite the increased risk of a poor prognosis.

4. Conclusions

It is not clear if an early ICD re-implantation is a more beneficial approach in case of a proinflammatory state and a spontaneous cardiac rhythm than a delayed approach. Further studies are awaited to deal with disputes of appropriate therapeutic approaches' timing and implement future guidelines.

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