

# Implantable cardioverter defibrillator pocket infection caused by *Klebsiella pneumonia*

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## Abstract

Like any other foreign bodies, implanted cardiac devices can become infected. Staphylococcus aureus and coagulase-negative Staphylococci are the most common causes of infections of pacemaker and defibrillator systems. In this case an implantable cardioverter defibrillator pocket infection caused by an extremely rare microorganism, *Klebsiella pneumonia*, is presented.

**Key words:** Implantable cardioverter defibrillator, pocket infection, *Klebsiella pneumonia*

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## Introduction

Automatic implantable cardioverter defibrillators (ICDs) triggered revolutionary changes in the treatment of patients with malign ventricular arrhythmias, and in accordance with this, their clinical usage indications have expanded gradually. However, due to the increases in the amount of devices used, ICD infections have turned to become more often encountered problems in clinical practice<sup>1</sup>. Organisms responsible from the ICD pocket infections may be found in the blood, pocket region or upon the device<sup>2</sup>. The agent is usually one of the various microorganisms settled on the skin flora of which Staphylococcus aureus and coagulase negative staphylococci are the most probable candidates<sup>3</sup>. In this case an ICD pocket infection caused by *Klebsiella pneumonia*, which is a rare cause, is presented.

## Case report

A 49-year-old male patient who had an ICD implantation with a long procedural time (90 minutes) 1.5 months ago due to non-ischemic cardiomyopathy was referred to our clinic with erythema, pain, erosion and increase in temperature on the ICD pocket (figure 1).

**Figure 1: Infected implantable cardioverter defibrillator pocket**



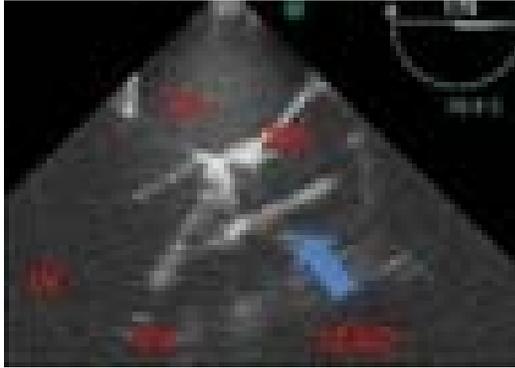
33x20mm (72 x 72 DPI)

His fever was 36.7°C, with a white cell count of 6950/mm<sup>3</sup>, sedimentation rate of 34/h, and C-reactive protein level was 12.6 mg/l. Electrocardiography revealed complete left bundle branch block. *Klebsiella pneumonia* was isolated in 3 consecutive cultures taken from the lesion area at different times. Urine analysis and chest x-ray were found to be normal. There was no microorganism isolation in the urine, blood and throat cultures that were performed in order to detect the focus of *Klebsiella pneumonia*. No vegetation was observed on the lead on transesophageal echocardiography (figure 2).

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**Figure 2: Transesophageal echocardiographic image showing implantable cardioverter defibrillator lead in right ventricle**



33x25mm (72 x 72 DPI)

The existing ICD system of the patient with generator and transvenous leads was explanted completely, and levofloxacin therapy was subsequently initiated according to the culture antibiogram (figure 3). By the 10<sup>th</sup> day of treatment, the infection regressed and ICD system was implanted on the opposite side of the infected pocket. The patient was discharged after stable clinical condition.

**Figure 3: Intraoperative appearance of infected implantable cardioverter defibrillator pocket.**  
33x28mm (72 x 72 DPI)



## Discussion

The incidence of permanent pacemaker infections constituting mostly pocket infection is about 0.13-19.9%. Approximately 25% of ICD pocket infections occur acutely in the first 1-2 months following the implantation of the device, however in some cases there might be delays as long as 8-12 months<sup>4</sup>. The mortality rate related with these infections was reported to be between 27-65%<sup>2,5</sup>.

Risk factors for ICD infections are prolonged operation, reoperation, change of generator device, catheter-related bacteremia, sternal injury infection, and diabetes mellitus<sup>6</sup>. Among all of these risk factors, only prolonged operation history existed in our case. Following the implantation of ICD, *S. aureus* is the most common cause of pocket infection in the first month, while coagulase negative is the primary responsible microorganism in the latter months<sup>1</sup>. Less usual agents are; Enterococci, Peptostreptococcus spp, Propionibacterium acnes, Mycobacterium avium-intercellulare, micrococcus, fungal pathogens and gram-negative bacilli. Klebsiella pneumonia is a very rare cause of ICD infections and may usually lead to lung, urinary, hepatobiliary, and injury infections<sup>7,8</sup>. In conclusion, this unusual microorganism should be kept in mind in ICD pocket infections.

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