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A Complicated Cardiac Pacemaker Case Resulting In Mastectomy and Death In Consequence Of Covid-19 Infection

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Abstract
Pacemaker implantation is a high risk procedure that always have the possibility of complications. Although the surgical procedure itself have a high risk for patient, anticoagulant drugs which were used after the procedure and patient-related factors play a role in this process. In this study, we aimed to present a complicated case with hemothorax, contralateral atelectasis, and large hematoma-induced tissue defect after a pacemaker implantation procedure in a patient with a history of contact with the COVID-19 virus.According to the literature, this case may be the first COVID-19 positive patient with a pacemaker to encounter multiple complications in this way.

Keywords: *Cardiac Pacemaker, COVID-19, Complication.*

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I. Introduction

Cardiac pacemaker applications are among the long-accepted treatment methods in patients with heart rhythm problems. Although pacemaker application is safe, it can cause different surgical complications as well as medical complications, as it is ultimately a surgical intervention (1). Among these are; rhythm disorders, swelling in the pacemaker pocket, infection, ache, hemorrhage, vascular injuries, pericardial tamponade, air embolism, lead dislodgment, hemothorax and pneumothorax (2,3).

The outbreak of severe acute respiratory syndrome caused by Covid-19 virus emerged in wuhan in December 2019 and has rapidly spread throughout the world (4). In treatment of COVID-19, hydroxychloroquine, Favipiravir and Azithromycin are used primarily and respiratory support is provided if needed. For patients requiring hospitalization, although different treatments are applied after diagnosis at different centers, enoxaparin treatment is common for all. (5). Therefore, complications such as hematoma can be seen secondary to this treatment. Although the virus infection itself may cause respiratory dysfunction and coagulopathy, also it can lead to death if DIC (Diffuse Intravascular Coagulopathy) occurs. This case highlights how difficult it can be to treat complications that may occur after a pacemaker implantation complicated by COVID-19 infection. Moreover, in this case, both the patient and the medical staff were infected with COVID-19.

II. Case Report

A 68-year-old woman who had no medical history of smoking, lung disease, or malignancy was admitted to the cardiology clinic due to palpitations. During his examination by the cardiology clinic, ventricular fibrillation attacks were detected, and because thepatient had a history of sudden cardiac arrest before and she did not respond to medical treatment cardiac pacemaker procedure was planned. As the patient had a history of contact with COVID-19 infected patient before, she underwent PCR analysis and pulmonary tomography before the procedure. Since PCR test and tomography results were negative in terms of covid-19 infection, the procedure was planned. Also, there were prevalent fibrotic bands and minimal pleural fluid were present on the preoperative pulmonary tomography of the patient.

During the insertion of the ICD (Intracardiac Defibrillator) type pacemaker through the left subclavian vein, the patient suddenly had symptoms consistent with pulmonary embolism. Immediately anticoagulant agents was started and patient was admitted into the the intensive care unit with the application of BPAP (Bilevel Positive Airway Pressure). 2 days later, because of the increasing respiratory distress symptoms and undetermined left lung parenchyma on chest X-ray (Figure 1), left thoracotomy was performed for the presence

of suspected haematoma or fluid. During the left thoracotomy, haematoma was observed as multilocular and fixed. Pneumolysis was performed in order to evacuate the left hemithorax completely and a tube was placed at 20-25 cm/H20 intercostal underwater pressure. Subsequently, second COVID PCR analysis was resulted positive.

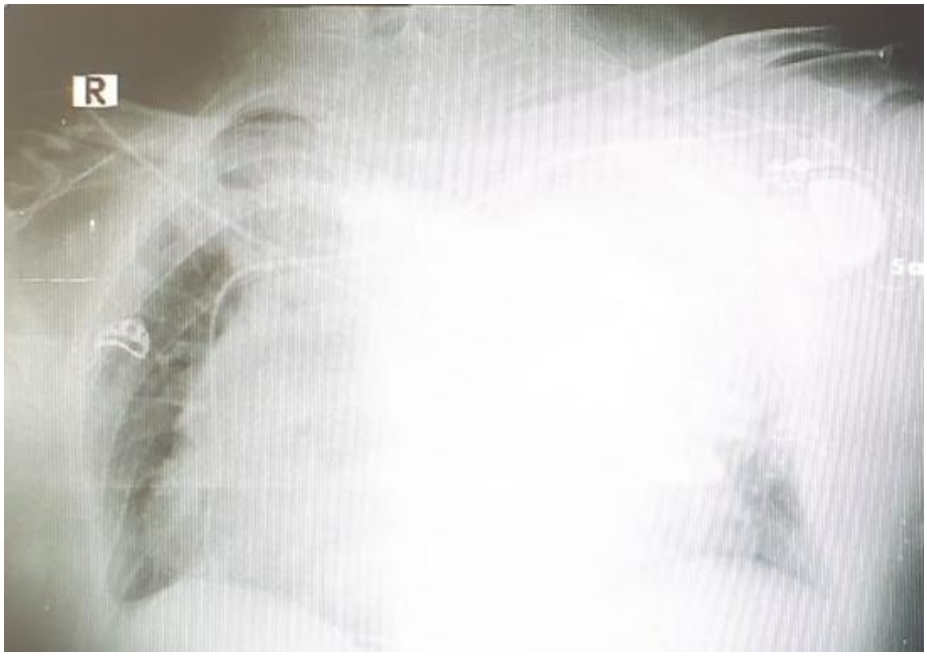

Figure 1: Opacity in the upper and middle regions of the left lung on a chest X-ray.

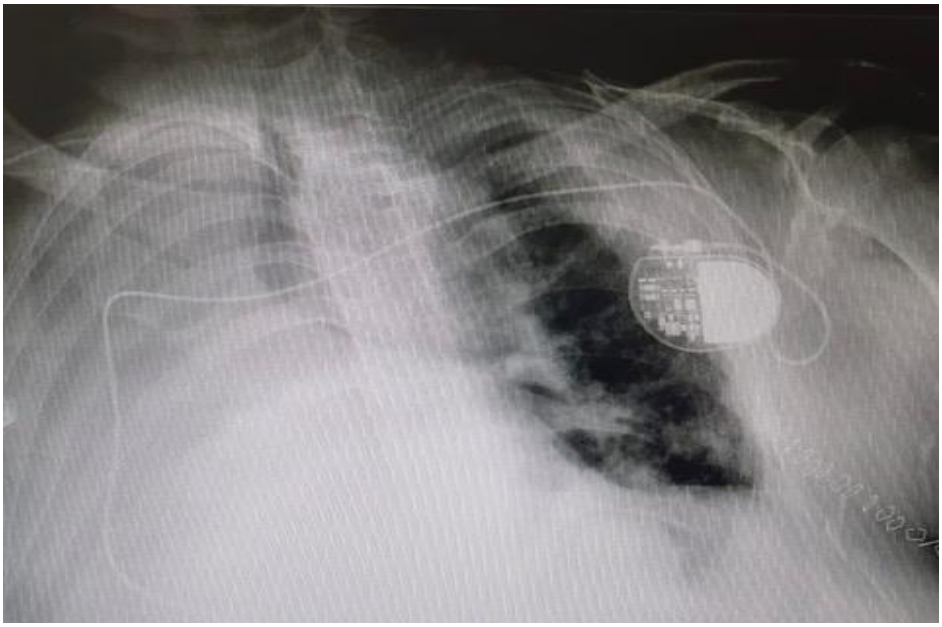

Figure 2: Presence of atelectasis and ipsilateral shift of trachea.

One week after the procedure, superficial tissue ultrasonography was performed to the patient due to the formation of swelling that occurred from the right armpit to the right breast. The result was interpreted in favor of subcutaneous hematoma.Anticoagulant doses of the patient were arranged in order to control hematoma. Later, right lung was observed to be atelectic in chest x-ray (Figure 2). Because the patient is also COVID-19 IgM positive, the blood values increased respectively to the levels listed as INR: 1.57, aPTT: 60 seconds, IL-6:> 5000, blood lymphocyte count <800 / µl,Ferritin 670 ng / ml, Procalcitonin: 21 ng / ml, D-Dimer: 2.52 ng / ml, CRP: 467 mg / l (Table 1).

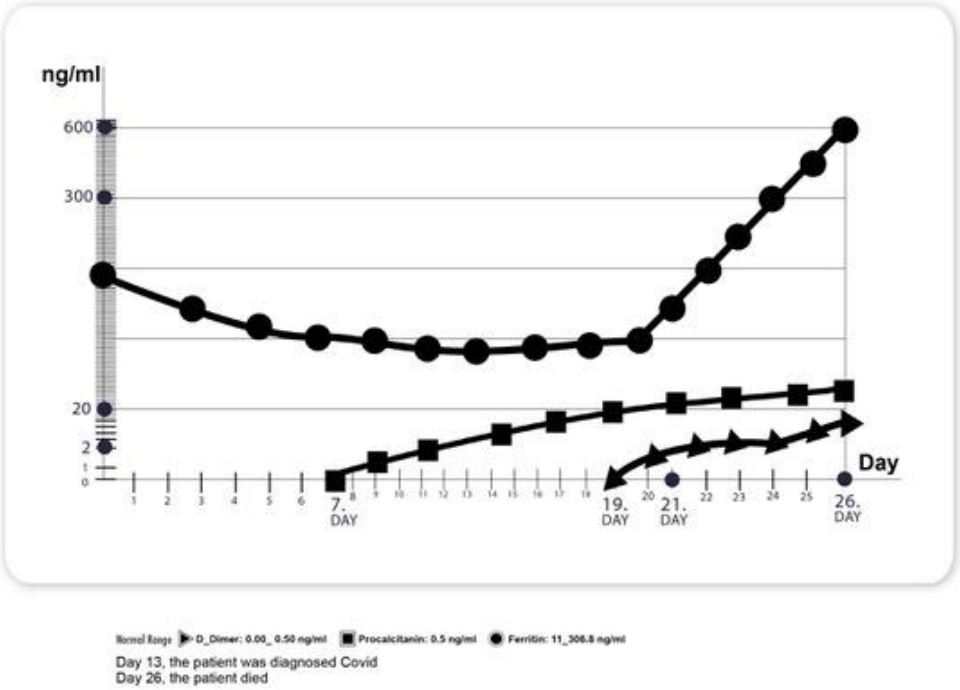

Table 1: Time chart of the patient's blood parameters (based on Covid's poor prognosis criteria).

In addition to the existing treatment Hydroxychloroquine (2X400 mg), Favipiravir (2X600 mg), Azithromycin (250 mg / day) was started, Enoxaparin was changed as (2x40 mg). The patient, had many bad prognostic criteria for COVID infection, was intubated consequtively. Afterwards, the swelling on the region of right breast, was gradually increased in size and necrotic foci developed on the skin, so plastic surgery consultation was held (Figure 3).

Figure 3: Necrotic tissue defect at the right posterior axilla.

Figure 4: Drainage of the hematoma that was over the pectoralis major muscle.

After the examination of the patient, hematoma was suspected and it drained under local anesthesia (Figure 4). After evacuation of hematoma, V.A.C(Vacuum Asisted Closure) treatment applied to the defect area for 3 sessions (Figure 5). After the blood parameters of infection dropped (CRP, leukocytes, fever attacks disappeared), the patient was operated under general anesthesia for debridement and reconstruction. Extensive Capsule formation was seen starting from the posterior axillar line, widely spreading entirely under the breast parenchyma (Figure 6). Capsulectomy and extensive debridement was performed and then hemostasis was achieved using electrocautery. The remaining breast tissue was advanced to the defect area with no dead space left (Figure 7).

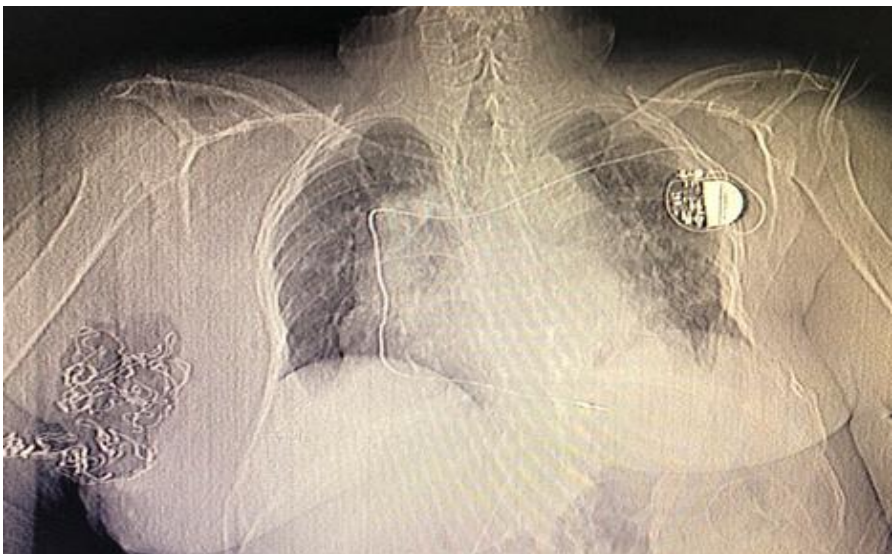

Figure 5: Soft tissue defect at the lateral of right breast.

Figure 6: Capsule formation in the area of the hematoma, soft tissue defect that requires debridement in the right breast.

Figure 7: Postoperative view of the patient (right lower quadranectomy wasperformed).

Right nipple was conserved. Drains were pulled out on the 3rd day. Hematoma did not occur again. Although prognosis of the patient was poor despite of the procedures performed. Eventually, she died on the 26th day of her hospitalization. All interventions to the patient by the surgical team and anesthesiologists were performed under protective equipment.

III. Discussion

In the treatment of fatal arrythmias, limited alternatives has led to a increase of pacemaker application procedures. Pacemaker complications can range from superficial hematomas to fatal infections or cardiac arrest (3). Among complications, arterial or venous-induced bleeding are common. Hemotorax; if associated with trauma, such as the insertion of a pacemaker, is a common complication. It usually occurs when searching for subclavian vessels to connect the leads to the heart. Although accumulation of blood in the pleural cavity can sometimes be self-limited, this is not always be possible. Thoracotomy may be required in large hematomas and

complicated cases. Even though the hemostasis is achieved after thoracotomy, if the damaged parenchyma is large or if the enlargement is insufficient, even pulmonary resection may be required (3).

COVID-19 infection can be mortal by affecting all systems, mainly in the respiratory system. In many post-epidemic studies, it has been shown that mortality decreases significantly with the use of heparin in the treatment of COVID-19 patients. It has been determined that this effect of heparin does not result only from its anticoagulant effect, but is obtained by its sequestration of acute phase proteins, inhibition of the migration of leukocytes and neutrophils, neutralizing of some complements and binding of inflammatory cytokines (5). In that respect, Enoxaparin has entered among the COVID-19 systematic treatments. Spontaneous hemothorax and haematoma can also occur due to the treatment of enoxaparin. As COVID-19 virus load increases, IL-6 measurement is important in terms of evaluating interleukin storm at this stage in these patients progressing to a clinical picture of DIC. IL-6 is a multifunctional cytokine. Due to immune hematopoietic activity and its acute phase response induction feature, it takes part in a wide range of defense systems (5).

Furthermore, If hematoma occurs for various reasons, the hematoma is usually expected to limit itself at the initial stage, while some patients require surgical intervention. Breast glandular tissue is usually atrophic in older patients and replaced with adipose tissue. Because of this, in this patient, bleeding progressed by finding suitable cleavage under the tender breast tissue and caused the breast tissue and surrounding tissues to suffer from necrosis. In terms of plastic surgery, for treatment of such tissue defects, taking under control of the post-debridement infection is primary. In the process of reconstructing the skin defects, skin grafts, skin equivalents, local skin flaps, muscle flaps or free flaps are among the options (6,7). It should be fundamental to select the shortest and the most beneficial option for patients with poor general condition and suffered from multiple complications such as this case. The patient died on the 26th day of hospitalization due to respiratory failure. We suggest that surgical procedures that increase morbidity, such as mastectomy, can lead to mortal outcomes with added COVID-19 infection. This shows us how COVID-19 infection can lead to surgical complications in different ways.

There are many cases in the literature where pacemaker complications have been described, but there has been no mention of a case infected with COVID-19 that has a fatal course. We think that complications in such complex patients increase the suppression of the immune system and decrease the resistance to infection.

In conclusion, although pacemaker implantation is a generally known as a safe procedure, we can say that the simultaneous infection of the patient with Covid-19 virus is a factor that complicates the post-procedure management and increases the morbidity (8).

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