

## COVID-19 Infection Occurring in The Postoperative Period in A Patient Who Underwent Coronary Artery Surgery

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### 1. Abstract

While the coronavirus-associated Covid-19 infection remains a risk for people all over the world as a pandemic, it is also a major catastrophic clinical situation for patients undergoing surgery in hospitals. If patients encounter this infection picture, especially after severe operations such as heart surgery, the life-threatening rates increase gradually.

In this article, we presented the aortic thrombotic process and lung infection that occurred after a patient undergoing coronary artery surgery was infected with corona virus during clinical follow-up. The patient, who was followed up in the intensive care unit due to lung involvement, did not undergo surgical intervention, since there was no ischemic clinical picture due to peripheral occlusion. However, the patient died due to Covid-19 infection.

### 2. Introduction

In patients infected with Covid-19 disease, the infiltrative infection state and hypercoagulopathic conditions in the lungs generally determine morbidity and mortality. These patients may primarily have infection-related consolidation in the lungs (ground glass appearance), pulmonary embolic conditions, and diffuse intra-body vascular thrombosis [1, 2].

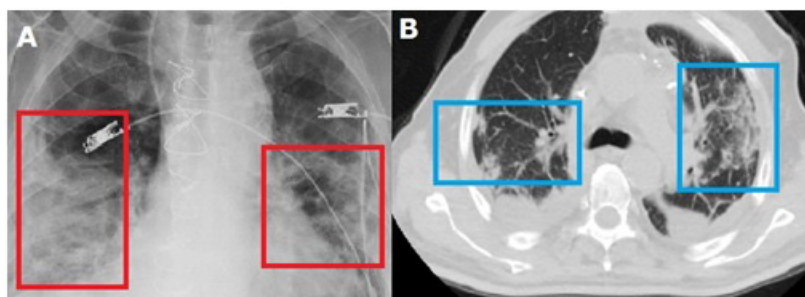
Although the treatment that can be given to patients with Covid-19 disease varies according to the clinical condition of the patient, it consists of globally accepted medications and medical life support treatments that can maintain the patient's vital functions (such as thrombolytic therapy, surgical embolectomy, and use of a ventilator) [2].

### 3. Case Report

Coronary bypass surgery (internal mammarian artery-left anterior descending coronary artery; aorta-circumflex coronary artery; aorta-right coronary artery) was performed for 3-vessel disease in a 58-year-old male patient. The patient, who survived the postoperative period without any problems, was transferred to the clinic from the intensive care unit on the 2nd day. In the clinic, on the 5th postoperative day, the patient had fever, cough and back pain, and pain and numbness began to occur in his feet. It was determined that respiratory oxygen saturation values decreased from 96 to 88 compared to the previous days. In addition, there was a decrease in the respiratory sounds of the patient with listening. Preoperatively, the distal limb pulses were palpable by hand, but now these pulsations were not palpable, but were evident on Doppler examination. In this clinical condition of the patient, a covid-19 infection was considered and the PCR test was sent. In addition, the patient was monitored by performing intensive breathing exercises, and pressurized oxygen therapy, heparin (enoxaparine 6000), antiviral (Favipiravir 200 mg 2x3), hydroxychloroquine (200 mg 1x1), ascorbic acid (1000 mg 2x1), steroid (methylprednisolon 80 1x1) treatments were started. Chest radiology demonstrated diffuse bilateral consolidation (Figure 1A), and peripheral ground-glass opacification consistent with SARS-CoV-2 infection on computed tomography (Figure 1B). Peripheral computed tomographic angiography was performed because a decrease in peripheral pulses was detected in the patient, who continued intensive medication. On angiography, thrombosed formations were detected starting from the renal levels (Figure 2A) towards the distal, especially in

the right iliac arterial bifurcation (Figure 2B). Again, sagittal sections showed a dense filling defect of the thrombus in the aorta (Figure 2C). Since the patient had no ischemic changes, it was decided to continue heparin therapy without surgical thrombectomy. The patient's PCR test was positive, and the hematologically blood table values of the patient, who was diagnosed with definite Covid-19, were checked again. The patient's white blood cell showed leukocytosis with  $18.2 \times 10^3$ , a middle thrombocytosis ( $666.9 \times 10^3$ ), and lymphopenia ( $0.66 \times 10^3$ ). D-Dimer and fibrinogen values were extremely elevated  $32.112 \text{ ng/mL}$  and  $9.865 \text{ mg/dL}$ , respectively. Serum procalcitonin and C-reactive protein values were also found to be high. The next day, when the oxygen

saturation in the clinic decreased to 82 percent, the patient was taken to the Covid-19 intensive care unit, intubated, and connected to mechanical ventilation. Since the peripheral blood circulation was found to be sufficient in the intensive care unit, it was decided to continue anticoagulant therapy without surgical embolectomy or thrombolytic therapy. In the intensive care unit follow-ups of the patient, lung oxygen saturation values varied between 80-85 % and partial oxygen pressure values (PaO<sub>2</sub>) between 47-52 mmHg. Patient whose general condition and haemodynamic parameters gradually deteriorate (arterial blood pressure: 72-80/33-40 mmHg, peak heart rate 117-125 / min) died on the 14th day of coronary artery bypass surgery due to cardiopulmonary insufficiency relation to covid-19 infection and complications.



**Figure 1:** (A) Consolidated infiltrative areas in bilateral lower zones compatible with Covid-19 infection on chest radiograph (red frames). (B) Covid-19 lung pneumonia showing a ground glass appearance on computed tomography (blue frames).



**Figure 2:** (A) Computed tomographic angiography showing thrombotic formation in the aorta at renal levels (red arrow). (B) Vascular stenosis causing thrombotic accumulation at the aortic iliac bifurcation level, particularly in the right iliac artery. Non-thrombosed left iliac artery (red and blue arrow). (C) Aortic thrombosis that obliterates the right iliac artery more frequently in the sagittal section at the level of the aortic bifurcation in computed tomographic angiography (red frame).

#### 4. Discussion

Although Covid-19 has a high mortality rate, especially in chronic and critically ill patients, it is a disease that affects all ages and healthy sections of the society. With the increasing number of them in the world, the clinical pictures and effects on patients are changing. Indeed, pandemic COVID-19 has recently identified a very significant increase in admissions to the intensive care unit of patients in need of ventilation support. Due to this increase, the patient population other than covid-19 is also affected by the course of this disease. Many patients with cardiac disease, organ failure, malignancy, surgical and traumatic patients are at risk of encountering this disease in an unknown place. Our patient started to receive treatment due to heart disease, successful coronary

bypass surgery was performed, but he encountered with SARS-CoV-2 catastrophic infection and lost his life [2, 3].

While Covid-19 patients continue to emerge with different clinical conditions and complaints, the life-threatening conditions related to this disease are generally known. Pneumonic infiltrations forming a ground-glass image in the lungs, pulmonary embolism and thrombosis in the organs and vascular structures of the body can be seen. Because 20% of these patients may have complications including coagulation disorders as well as infiltrative lung disease [1, 3]. These systemic inflammatory and thrombotic processes are triggered by a large macrophage activation that creates a "cytokine storm", the inflammatory process that develops after viral infection. Although PE is shown as the most common thrombotic disease in

these patients, arterial thrombosis may be even more important [3, 4]. Coagulopathy leads to high mortality and laboratory abnormalities such as high D-dimer are a particularly important marker. It has been stated that the use of heparin in patients with COVID-19 infection due to this widespread thrombosis reduces mortality, especially in patients with pulmonary embolism and high D-dimer levels [3-5]. Low molecular weight heparin recommends the use of heparin in therapeutic doses in all patients with COVID-19 who underwent surgery from the time of hospitalization or for any other reason. Our patient was conventionally receiving SC heparin treatment in the postoperative period due to coronary surgery. However, after the 3rd day, aspirin treatment was started and heparin treatment was discontinued. After the Covid-19 complaints and the test was positive, heparin treatment was started again. The timing of thrombosis occurrence is absolutely unclear. It has been stated that the approximate time for aortic or peripheral arterial thrombosis to become ischemically a clinical condition is between 10 and 25 days [1, 3, 4]. In our patient, this thrombotic process was observed to occur within the first ten days. However, since the exact time of the patient's disease cannot be determined, the emergence process is not clear.

There seems to be some general consensus around the world regarding the use of low molecular weight heparins to prevent the thrombotic process or after disease occurs [4-6]. However, cases causing pulmonary embolism and vascular occlusion have been reported while receiving this treatment. In many guidelines, intra-arterial thrombolysis, peripheral arterial catheter-directed thrombolysis and thrombolytic therapy have been used. Our patient had non-ischemic thrombotic changes in the peripheral lower extremities. the patient was not at risk for limb loss. Therefore, interventional or surgical thrombectomy was not performed, and our patient was followed up with medical anticoagulant therapy.

## 5. Conclusion

Although it is not clear when Covid-19 disease will occur in a patient, it should be kept in mind that this thrombotic process and event may occur in every patient. Especially a patient who has undergone surgery and can be visited at the hospital at any time can easily get Covid-19 disease. In addition, in this article, we summarized the worst prognostic and disastrous thrombotic condition of covid-19 disease, and unfortunately we witnessed how the patient died.

## 6. Acknowledgments

Written informed consent was obtained from the patient's legal guardians/parents for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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