Superior Mesenteric Artery Thrombosis as a Complication of COVID-19 Pneumonia: A Case Report

COVID-19 Pnömonisi Komplikasyonu Olarak Süperior Mezenterik Arter Trombozu: Olgu Sunumu

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ABSTRACT

Although coronavirus disease 2019 (COVID-19) was initially considered to be a respiratory disease, over time it started to be acknowledged as a multisystemic disease. One of the reasons for this multiorgan involvement is an increased risk of thrombosis. We aimed to present the development of superior mesenteric artery (SMA) thrombosis in a 79-year-old patient with COVID-19. Due to the increase in abdominal pain during the follow-up direct radiography and ultrasonography were repeated, and abdominal computed tomography (CT) was also undertaken. In the CT examination, SMA was observed to be occluded starting from the middle portion. SMA thrombosis is important because it can be fatal and its symptoms can be confused with those of COVID-19. The possibility of this condition should be considered in the presence of abdominal pain, especially in COVID-19 patients with risk factors in order not to delay diagnosis and treatment.

Keywords: COVID-19, superior mesenteric artery, arterial thrombosis, acute mesenteric ischemia

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ÖZET

Koronorvirüs hastalığı- 2019 (COVID-19) ilk planda solunum yolu hastalığı olarak prezente olan bir hastalıktır. Ancak zamanla COVID-19'un multisistemik bir hastalık olduğu görülmüştür. Bunun nedenlerinden birisi de tromboz riskinin artmasıdır. Çalışmamızda 79 yaşında COVID-19hastada süperior mezenterik arter (SMA) trombozu olgusunu sunmayı amaçladık. Hastanın takiplerinde karın ağrısının artması üzerine direkt grafi ve ultrasonografi tetkiki tekrarlandı ve bilgisayarlı tomografi tetkiki gerçekleştirildi. Bu tetkikte SMA orta kesimden itibaren tromboze olarak izlendi. SMA trombozu çok mortal seyretmesi ve semptomlarının COVID-19hastalığı ile karışabilmesi nedeniyle önem arzetmektedir. Özellikle risk faktörleri olan COVID-19hastalarında karın ağrısı geliştiğinde tanı ve tedavide geç kalınmaması için akılda tutulmalıdır.

Anahtar Sözcükler: Covid-19, süperior mezenterik arter, arteriyal tromboz, akut mezenterik iskemi

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INTRODUCTION

Although coronavirus disease 2019 (COVID-19), which created a global pandemic, was initially considered to primarily affect the respiratory tract, it is now acknowledged as a multisystemic disease, is known to involve many organs. As one of the reasons for this multiorgan involvement, the disease induces the immune system and activates a large number of cytokines, which subsequently results in dysregulation in the immune system (1). COVID-19 increases the risk of both arterial and venous thromboses. However, the prevalence of thrombosis risk in COVID-19 infection has not yet been clarified (2). In the current literature, there are very few cases of superior mesenteric artery (SMA) thrombosis associated with COVID-19 pneumonia.

CASE REPORT

A 79-year-old male patient presented to our hospital with upper respiratory tract symptoms, such as muscle and low back pain and nasal discharge. A nasopharyngeal sample was taken from the patient for the real time reverse transcription-polymerase chain reaction test, and the result was positive. Thoracic computed tomography (CT) was performed, which revealed minimal ground glass involvement in both lungs, and therefore it was considered that the patient should be followed up at home. The patient had chronic heart failure, for which he was using edoxaban and acetylsalicylic acid. On the third day of COVID-19 positivity, the patient presented to our hospital again with the complaints of chest and abdominal pain. According to the laboratory tests, his troponin value was within the reference range of 0-34 (12.1 ng/L). The D-dimer value was 1.97 (0-0.55) mg/L, and ferritin was 341.50 (21.81-274.66) ng/ml. The remaining laboratory parameters were evaluated to be within their normal ranges. The patient was admitted to the inpatient ward, where he was followed up under 4-liter nasal oxygen therapy. Contrast-enhanced thoracic CT and erect plain abdominal radiography (AR) (Figure 1A) were performed to investigate the etiology of pain. Then, abdominal ultrasonography (USG) was performed. No pulmonary embolism was detected in the thoracic CT examination, but AR showed that intestinal loops were filled with gas in the left upper quadrant, which was considered to be within normal limits. There was no other remarkable feature on CT nor any finding requiring urgent intervention in the USG examination. During the follow-up, increased abdominal pain was detected in the left upper quadrant in the physical examination, and therefore oral intake was stopped. AR and abdominal USG were repeated. Dilatation was observed to have increased in the left upper quadrant loops on AR (Figure 1B). USG revealed minimal free fluid in the pelvic region and focal segmental dilatation in some intestinal loops, upon which abdominal CT was taken in the arterial phase and SMA was found to have been occluded starting from the middle portion (Figure 2A, 2B). In the left upper quadrant, there was mild dilatation in the jejunal loops, and contamination was observed in the surrounding fat planes. The patient was started on heparin therapy at the therapeutic dose. He underwent laparotomy and thrombectomy and did not have any complaints during the follow-up. He was discharged from the hospital on the seventh postoperative day. Written and informed consent from the patient was obtained for publishing this case report.

Figure 1: A) Abdominal radiography showing the presence of gas in the intestinal loops in the left upper quadrant but no pathological finding.

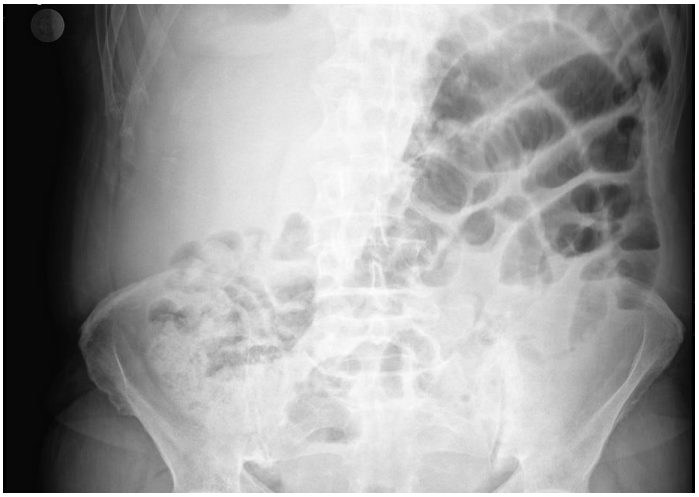

Figure 1: B) Follow-up examination revealing an increase in gas in the intestinal loops and dilatation in the left upper quadrant.

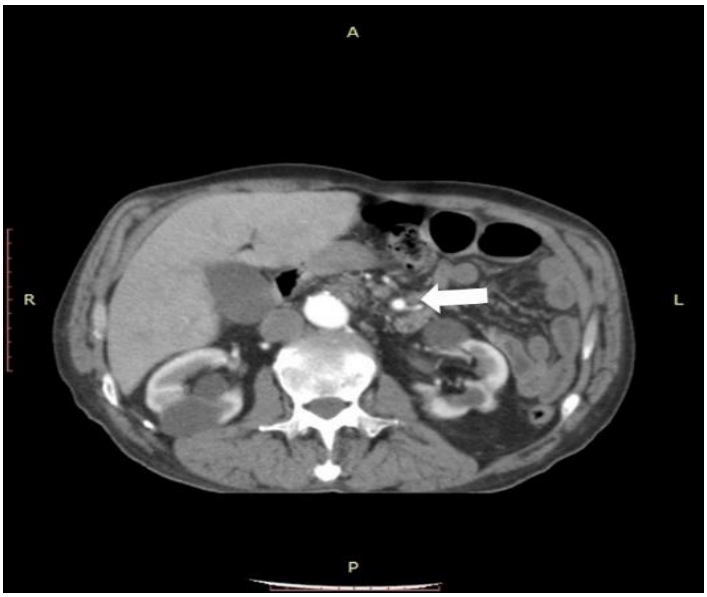

Figure 2: Arterial phase abdominal computed tomography images showing **A)** The full contrast enhancement of the superior mesenteric artery up to the middle portion (arrow)

Figure 2: Arterial phase abdominal computed tomography images showing **B)** Occlusion of the artery after the middle portion (arrow).

DISCUSSION

In this paper, we presented a COVID-19 patient with the complaint of abdominal pain, who was later diagnosed with SMA thrombosis. The incidence of acute mesenteric ischemia is reported to be 120 million annually. Approximately two-thirds of these cases develop due to thrombotic mesenteric artery occlusion, while the remainder issecondary to mesenteric venous occlusion or non-occlusive mesenteric ischemia (3). The most common cause of mesenteric ischemia is SMA thrombosis. Acute mesenteric ischemia is a condition that requires emergency intervention and has a high mortality rate of up to 80%. The co-existence of acute mesenteric ischemia with COVID-19 can even be more deadly due to the nature of the two diseases (4).

COVID-19 significantly increases the risk of thrombosis, mostly in the venous system. The etiology of the increased risk of thrombosis at this level has not yet been fully clarified. However, in the literature, possible etiological factors underlying coagulopathy have been listed as increased inflammatory mediators, immobilization, and endothelial damage secondary to the expression of angiotensin-converting enzyme 2 receptor (5). In addition, the presence of hypoxia may further increase the risk of thrombosis in COVID-19 cases by increasing blood viscosity and activating the hypoxia-inducible transcription factor-dependent pathway. In addition, it has been reported that patients with an increased risk of thrombosis are generally elderly and hypertensive. It is suggested that among laboratory parameters, elevated levels of D-dimer, cardiac troponin, and interleukin-6 indicate a higher risk for thrombosis (6). Similarly, in our case, the D-dimer value was found to be high.

To date, approximately 20 cases of SMA thrombosis have been reported in COVID-19 patients. As reported in the literature, gastrointestinal symptoms in COVID-19 patients may overlap with the disease itself, and therefore the diagnosis may be delayed. In addition, when the clinical presentation is considered, there are patients describedonly as simple abdominal pain, as well as those with peritonitis complaints, such as widespread severe pain in the entire abdomen, vomiting, and fever (7,8). Our patient had progressive abdominal pain, but it did not reach a serious level. Systemic findings, such as fever were not observed.

The restoration of early vascularization is the first treatment option in SMA occlusion. However, at a later stage, when progression to ischemia and necrosis is seen in the intestinal loops, there is no longer a chance of therapeutic treatment (3). In the literature, since studies on patients with COVID-19 and SMA are only in the form of case reports and case series, there is no treatment method on which a consensus has been reached. Nevertheless, it is recommended that the treatment protocols applied in patients with normal SMA thrombosis should take into account the clinical findings and ischemia duration of the patient (8). Similarly, different treatment protocols are observed in case reports in the literature. Endovascular treatment was applied in patients in the early period only in a small number of studies (8,9), while the surgical procedure was performed during the treatment process in many cases (10). In addition, there are studies where it is recommended to start heparin in COVID-19 patients at the time of hospitalization. Heparin is recommended in COVID-19 due to its anticoagulant, anti-inflammatory and endothelial protective effects (10). It has also been reported that heparin can be used in these patients to reduce the risk of venous thrombosis. In the literature, heparin or low-molecular-weight heparin are observed to be frequently used in these patients (9).

In conclusion, SMA thrombosis is a life-threatening clinical condition. However, it can be overlooked and diagnosed late in patients with COVID-19. SMA thrombosis should be kept in mind, especially in patients who are prone to hypercoagulation and have high risk factors. Therefore, anticoagulation therapy may be beneficial in preventing thrombotic events in hospitalized patients with risk factors. In addition, CT with contrast enhancement is required for the diagnosis of SMA in patients presenting with abdominal pain, who have an active or a recent history of COVID-19 infection.

Conflict of interest

No conflict of interest was declared by the authors.

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