CASE REPORT

Spontaneous rectus sheath hematoma in three patients with COVID-19: Computed tomography findings

Serap Baş, M.D.,[1] Metin Bektaş, M.D.[2]

[1]Department of Radiology, Başakşehir Çam and Sakura City Hospital, İstanbul-*Türkiye*

[2]Department of Anesthesia and Reanimation, İstanbul Yeni Yüzyıl University, Gaziosmanpaşa Hospital, İstanbul-*Türkiye*

ABSTRACT

The pulmonary symptoms secondary to severe acute respiratory syndrome in coronavirus (COVID-19) infections are the most common presentation for the disease; however, it is now known that in a small portion of patients, severe hemorrhagic complications can also be seen. In this report, three cases of elderly women with known COVID-19 infection, developing spontaneous rectus sheath hematoma on anticoagulation therapy, are presented. Three cases presented above emphasize the need to perform a computed tomography examination after a sudden hemodynamic deterioration and a decrease in hemoglobin count in COVID-19 patients in intensive care units (ICUs). Since this clinical deterioration can be caused by spontaneous rectus sheath hematomas (RSH), it must be taken into consideration while examination. If these RSHs rupture into the abdominal cavity, the outcome may be fatal in few hours as represented in two of our cases. Major spontaneous hemorrhage in COVID-19 patients is quite uncommon; therefore, it may cause serious complications as it is rarely taken into consideration. Failure to acknowledge such a risk could significantly worsen the prognosis of the patients especially in ERs and ICUs.

Keywords: COVID-19 disease; intensive care units; spontaneous rectus sheath hematoma.

INTRODUCTION

The pulmonary symptoms secondary to severe acute respiratory syndrome in coronavirus (COVID-19) infections are the most common presentation for the disease; however, it is now known that in a small portion of patients, severe hemorrhagic complications can also be seen. Even though, the exact mechanism remains unknown, COVID-19 can lead to multisystem organ failure, pro-thrombotic states, cytokine storm, and a form of disseminated intravascular coagulopathy which could theoretically predispose to spontaneous hemorrhage.[1,2] Moreover, most of the patients receive antithrombotic prophylaxis due to hypercoagulability, related to the disease. Palumbo et al.[3] reported the incidence of major spontaneous hemorrhage in COVID-19 patient population as 1.8%. This provided data can be considered higher than the reported incidence of major spontaneous hemorrhage in general admissions which are on prophylactic anticoagulation, recorded as 1%. In this report, three cases of elderly women with known COVID-19 infection, developing spontaneous rectus sheath hematoma on anticoagulation therapy, are presented.

CASE REPORT

Case 1– A 75-year-old woman, subjected to oral anticoagulant therapy after a recent aortic valve repair and coronary bypass graft, presented with shortness of breath and cough. At the admission, the patient was febrile. Chest computed tomography (CT) scan revealed bilateral ground-glass opacities with thickened interlobular septae. The patient was diagnosed with COVID-19 based on polymerase chain reaction (PCR) testing and hospitalized in the intensive care unit (ICU). The patient began to receive antivirals, antibiotics, anticoagulation, and antiaggregant therapy. The patient, who

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Address for correspondence: Serap Baş, M.D.
Başakşehir Çam ve Sakura Şehir Hastanesi, Radyoloji Bölümü, İstanbul, Türkiye
Tel: +90 212 - 909 60 00 E-mail: serapbas579@gmail.com

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had previously received oral anticoagulant treatment, was started on the day of hospitalization in the ICU with 2×6000 IU Enoxaparin sodium (ES) and 100 mg/day acetyl salicylic acid (ASA). On the 3rd day of ICU, the patient suddenly became hypotensive, and her clinical status declined in a few hours. The hemoglobin count decreased more than 3 mg/dL. The routine unenhanced chest and abdominopelvic CT scans were immediately taken. On abdominopelvic CT, a huge hematoma in the right rectus muscle which was ruptured into the abdominopelvic cavity was shown. Fluid-fluid levels and pelvic hyperdense hematoma were seen (Fig. 1a-c). Surgery was planned urgently, but the patient passed away in a few hours.

Case 2– A 68-year-old woman with a medical history of hypertension presented to the emergency department complaining of shortness of breath, getting worse progressively. At the admission, the patient was febrile and tachycardic. Chest CT revealed bilateral ground-glass opacities and crazy paving pattern with consolidations. The patient was diagnosed with COVID-19 based on PCR testing. She was internalized in the ICU and intubated soon after. The patient began antiviral, antibiotics, anticoagulation, and antiaggregant therapy. 2×6000 IU ES and 100 mg/day ASA were started on the patient who was taken directly to the ICU from the emergency department. On the 15th day of the treatment, the ES dose was reduced to 1×4000 IU according to the INR value. ASA has been discontinued. On the 20th day of admission, the hemoglobin count was found to decline more than 3 mg/dL and there was no sign of hemorrhage on the external observation. The hemoglobin count continued to decrease, and unenhanced chest and abdominopelvic CT examinations were taken. A huge hematoma in the left rectus muscle was shown on abdominopelvic examinations (Fig. 2a-c). The patient was transfused 2 units of packed blood cells. Endovascular percutaneous treatment was planned if the blood count continued to decrease. During the following days, the patient's hemoglobin count remained stable; therefore, any interventional approach needs to be done.

Case 3– A 42-year-old woman with a history of renal transplantation, done 10 years ago, presented with fever and cough. The patient was diagnosed with COVID-19 based on PCR testing and hospitalized. The patient, who was using 100 mg/day ASA as a prophylactic due to renal transplantation, was interned at the COVID service. In addition to this treatment, 1×6000 IU ES was started. Furthermore, the patient began to receive antiviral therapy immediately. On the 4th day of the hospitalization, the patient suddenly became hypotensive and the routine chest and abdominopelvic CT were taken. On the abdominopelvic CT, it was shown that a huge hematoma in the right rectus muscle had ruptured into the abdominopelvic cavity (Fig. 3a-c). The patient passed away in a few minutes due to hypovolemic shock, despite the

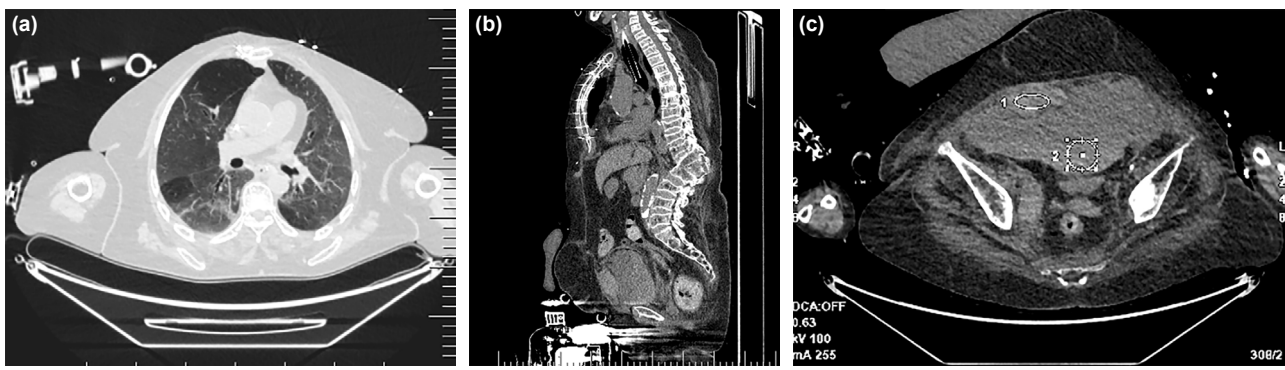

Figure 1. Case 1 – **(a)** Thorax BT and viral pneumonia compatible with COVID-19, **(b)** abdominopelvic computed tomography (CT), sagittal image, right rectus sheath hematomas (RSH), and **(c)** abdominopelvic CT, axial image, right RSH ruptured into the abdominopelvic cavity.

Figure 2. Case 2 – **(a)** Thorax BT, viral pneumonia compatible with COVID-19, bilateral ground-glass opacities, and crazy paving patern with consolidations, **(b)** abdominopelvic computed tomography (CT), sagittal image, and left rectus sheath hematomas (RSH), and **(c)** abdominopelvic CT, axial image, and left RSH.

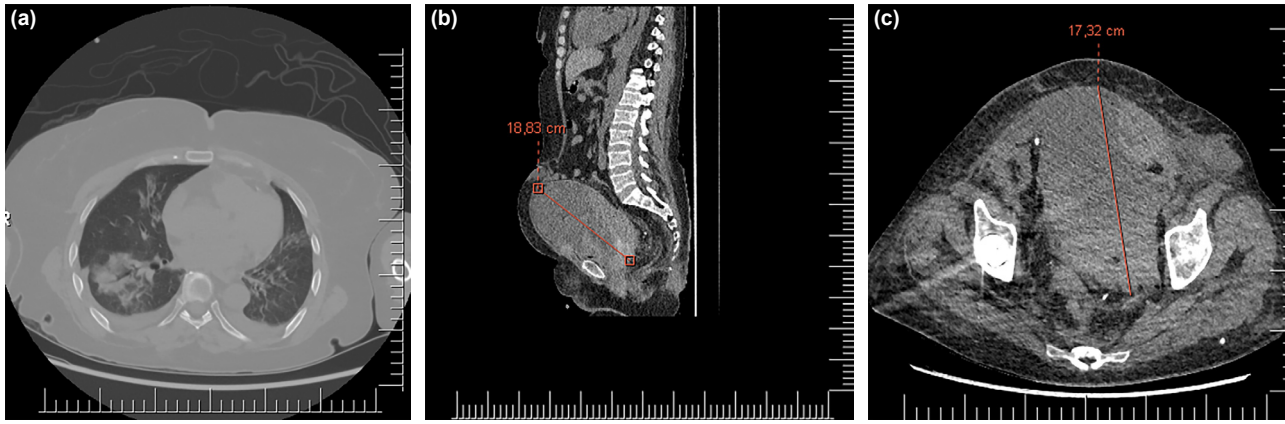

Figure 3. Case 3 - **(a)** Thorax BT and viral pneumonia compatible with COVID-19, **(b)** abdominopelvic computed tomography (CT), sagittal image, and left rectus sheath hematomas (RSH), and **(c)** abdominopelvic CT, axial image, and left RSH ruptured into the abdominopelvic cavity.

aggressive volume replacement therapy. The consents of the patients' have been taken.

DISCUSSION

Spontaneous rectus sheath hematoma is a rare condition which may not be taken into consideration in clinical practice, especially in emergency rooms (ERs) and ICUs. Major risk factors demonstrated in the literature are anticoagulation, trauma, coughing, intense muscular contraction, pregnancy, vasculitis, and hemorrhagic disorders.[4] The most common symptoms of SRSH are abdominal pain, palpable abdominal mass, abdominal ecchymosis, peritoneal irritation, and a decrease in hemoglobin count.[4,5] In some cases, especially in ICUs, a decrease in hemoglobin count may be the sole noticeable evidence. The patients may be intubated and there was not any evidence on external examination. Early and appropriate recognition remains crucial, as it may be fatal if diagnosis is delayed.

CT is the diagnostic modality of choice, providing not only more accurate information such as location, size, origin, and extension of the rectus hematoma, but also excludes other acute abdominal pathologies. The typical unenhanced CT findings are hyperdense muscular mass (measuring between 60 and 80 Hounsfield units), a mixed pattern with fluid-fluid levels due to the hematocrit effect, an isodense mass with hypodense areas. A contrast material extravasation and active arterial bleeding site seen on CT angiography may also provide useful information for interventional and surgical treatment.[6] İliklerden et al.[7] in their series of 31 cases, they reported abdominal pain as the most common symptom (100%) and the second most common abdominal wall mass (80.6%). In their study, diagnosis of RHS was confirmed by CT in 11, ultrasonography (USG) in five, and CT with USG in 15 cases. In ICU patients with complaints and/or suspected rectus sheath hematomas (RSH), USG may be the first choice of radiological method, as it is fast and easily accessible. However, two of our patients were intubated in the ICU and sudden Hg decrease occurred. Sudden hypovolemia developed in our third patient without any complaints. Therefore, CT was used in diagnosis to investigate the bleeding focus in the three spaces.

In most rectus hematomas, the management is conservative and self-limited as the bleeding tamponades itself. However, surgical treatment is recommended for complicated hematomas and large hematomas which may cause hemodynamic disorders. Nowadays, interventional radiological techniques can be performed as an alternative to surgery in serious cases of active bleeding.[8]

There are several cases in the literature regarding hypercoagulability pattern of vascular disease in COVID-19 patients; however, hemorrhagic complications in COVID-19 patients have only been mentioned in just a few. Palumbo et al.[3] reported that among 818 patients, 15 patients suffered from a serious arterial bleeding episode, bringing the incidence of spontaneous hemorrhage to 1.8%. Hemorrhage was evaluated with contrast enhanced, multiphase CT scans and treated successfully with interventional procedures. Conti et al.[9] reported two cases of spontaneous ileopsoas hematomas in COVID-19 patients. Rogani et al.[10] presented two cases of spontaneous muscle hematoma in which one of the patients was treated with coil embolization of hematoma's arterial afferences. Daid et al.[11] presented a case of spontaneous intraparenchymal hepatic hemorrhage as a sequel of COVID-19 patients. Altschul et al.[12] noticed that intracranial hemorrhagic presentations (acute subdural hematoma, subarachnoid hemorrhage, multi-compartmental hemorrhage, multifocal intracerebral hemorrhage, and focal intracerebral hemorrhage) in COVID-19 patients are rare (35 out of 5227 patients) especially in patients with multi-focal and multi-compartmental intracerebral hemorrhage had an extremely poor overall prognosis with a mortality rate of 63.6%.

Three cases presented above emphasize the need to perform a CT examination after a sudden hemodynamic deterioration

and a decrease in hemoglobin count in COVID-19 patients in ICUs. Since this clinical deterioration can be caused by spontaneous RSH, it must be taken into consideration while examination. If these RSHs rupture into the abdominal cavity, the outcome may be fatal as represented in two of our cases. As mentioned in the study, RSH in patients in the ICU is due to anticoagulant therapy. Since anticoagulant therapy may lead to fatal complications in ICU patients, maximum care should be taken to avoid complications during anticoagulant therapy.

Conclusion

COVID-19 patients most commonly present with severe acute pulmonary symptoms to the ERs and ICUs. Extrapulmonary involvement, such as gastrointestinal, cardiovascular, and renal, has been reported suggesting a broad range of complications. Among these, vascular involvement in COVID-19 appears to be related not only to hypercoagulability features, but also to the bleeding ones. Major spontaneous hemorrhage in COVID-19 patients is quite uncommon; therefore, it may cause serious complications as it is rarely taken into consideration. Failure to acknowledge such a risk could significantly worsen the prognosis of the patients especially in ERs and ICUs.

Informed Consent: Written informed consent was obtained from the patients for the publication of the case report and the accompanying images.

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OLGU SUNUMU - *ÖZ*

Covid-19'lu üç hastada spontan rektus kılıf hematomu: Bilgisayarlı tomografi bulguları

Dr. Serap Baş,[1] Dr. Metin Bektaş[2]

[1]Başakşehir Çam ve Sakura Şehir Hastanesi, Radyoloji Bölümü, İstanbul
[2]İstanbul Yeni Yüzyıl Üniversitesi, Gaziosmanpaşa Hastanesi, Anestezi ve Reanimasyon Bölümü, İstanbul

Koronavirüs (Covid-19) enfeksiyonlarında şiddetli akut solunum sendromuna sekonder pulmoner semptomlar, hastalığın en sık görülen prezentasyonu olmakla birlikte, hastaların küçük bir kısmında ciddi hemorajik komplikasyonların da görülebildiği artık bilinmektedir. Bu yazıda, antikoagülan tedavi sırasında spontan rektus kılıf hematomu (RSH) gelişen, Covid-19 enfeksiyonu olduğu bilinen üç yaşlı kadın olgusu sunuldu. Bu olgular, yoğun bakım ünitelerinde Covid-19 hastalarında ani hemodinamik bozulma ve hemoglobin sayısında azalma sonrasında bilgisayarlı tomografi (BT) incelemesi yapılması gerektiğini vurgulamaktadır. Bu klinik bozulma ve hemoglobin düşüşü spontan RSH'den kaynaklanabileceğinden muayene sırasında dikkate alınmalıdır. Bu RSH'ler karın boşluğuna açılırsa, iki olgumuzda gösterildiği gibi sonuç birkaç saat içinde ölümcül olabilir. Covid-19 hastalarında majör spontan kanama oldukça nadirdir, bu nedenle nadiren dikkate alındığı için ciddi komplikasyonlara neden olabilir. Böyle bir riskin gözardı edilmesi, özellikle acil servislerde ve yoğun bakım ünitelerinde hastaların prognozunu önemli ölçüde kötüleştirebilir.

Anahtar sözcükler: Covid-19 hastalığı; spontan rektus kılıf hematomu; yoğun bakım ünitesi.

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