

Spontaneous Multiple Haematomas in a Patient with Severe COVID-19 Fully Recovered with a Conservative Approach

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Abstract: A significant number of hospitalized patients with COVID-19 are prone to thromboembolic events including deep vein thrombosis, pulmonary embolism, cerebrovascular accident, and myocardial infarction. However, some COVID-19 patients have a higher risk of bleeding that is associated with an increased risk of mortality. We report a 71-year-old woman who was a confirmed case of COVID-19 admitted for pulmonary involvement and complicated acute renal failure. During hospitalization, she suffered from a sudden onset of severe pain in the lower left abdomen as well as a sudden drop in blood pressure and hemoglobin. Haematomas in the left rectus and obturator internus muscle were observed in abdominal and pelvic computed tomography scan. Signs of haemorrhage were also seen in the anterolateral aspect of the bladder with extension to the paracolic, subdiaphragmatic, perihepatic and, perisplenic spaces. The patient was totally recovered by a conservative approach. Bleeding tendency could be a serious complication, especially, in COVID-19 patients with complicated renal failure that receive heparin prophylaxis.

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Introduction

Patients with severe form of COVID-19 are at risk of systemic coagulopathy which mostly appears as thrombotic events rather than bleeding tendency. High ACE2 expression in the endothelium of blood vessels is responsible for the attachment of SARS-CoV-2 spike protein leading to internal injury inside the vascular wall of blood vessels (Tang et al., 2020). Subsequently, thrombosis can develop in many organs causing pulmonary embolism, deep vein thrombosis, cerebrovascular accident, myocardial infarction, and mesenteric ischemia (Miesbach and Makris, 2020).

Although thrombotic events represent the most common coagulation disorders, few patients with COVID-19 have a higher tendency to bleeding for many reasons including consumption of coagulation factors, thrombocytopenia and administration of anticoagulant (Al-Samkari et al., 2020).

Herein, we describe a confirmed COVID-19 patient with severe bleeding presenting as multiple intramuscular haematomas that fully recovered after a severe critical condition without any interventional and surgical management.

Case report

A 71-year-old woman with a history of hypertension and hypertrophic cardiomyopathy presented to the Emergency Department (ED) complaining of cough, dyspnea, and vomiting, on 14 April 2021. The disease started 12 days before admission with myalgia, fatigue and anorexia followed five days later by nausea, vomiting, dry cough and shortness of breath. She denied sore throat, nasal discharge or obstruction, anosmia and diarrhea during this period of time.

The patient was admitted four days before her recent admission complaining of fever, malaise, cough and mild shortness of breath but she did not receive any medical treatment except oxygen and fluid therapy; and was discharged after two days. Following the progression of dyspnea at home, she was referred to our ED two days later for further evaluation and treatment. She had a long history of hypertension, for which she had been treated with triamterene H, amlodipine and atenolol. The patient had been hospitalized twice for uncontrolled hypertension and heart disease. She did not have any history of chronic kidney injuries, diabetes mellitus or chronic obstructive pulmonary diseases.

On admission, she appeared ill but was alert and responded to all of the questions by herself. Her temperature was 37.5 °C; blood pressure 130/80 mm Hg; heart rate 98 beats/min; and respiratory rate 24/min. Oxygen saturation (SpO₂) was 88–90% while breathing in ambient air and the ratio of arterial oxygen partial pressure to fractional inspired oxygen (PiO₂/FiO₂ ratio) was 270. The most important results of laboratory blood tests taken at the time of admission and subsequently are demonstrated in Table 1. It should be mentioned that her last routine laboratory test was done approximately three years ago with normal results. Real-time polymerase chain reaction analysis of a nasopharyngeal and oropharyngeal swab sample confirmed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.

Table 1 – Laboratory tests during the hospitalization

Laboratory tests (unit)	14-April	18-April	23-April	24-April	26-April	1-May
White cell count (/μl)	7.500	10.700	19.600	26.500	15.000	5.500
Neutrophil count (%)	85	86	89	94	89	75
Haemoglobin (g/dl)	14	12.80	8.7	6.7	10.7	11.3
Platelet count (/μl)	110000	165000	211000	120000	65000	165000
Blood urea nitrogen (mg/dl)	60	53	46	55	33	23
Creatinine (mg/dl)	2.6	2.3	2.1	2.6	1.7	1.1
Prothrombin time/INR (second)	13(1)	14(1.2)	13(1)	13(1)	13(1)	13(1)
aPTT (second)	30	35	100	110	36	38
Aspartate amino-transferase (IU/l)	12		514		169	42
Alanine amino-transferase (IU/l)	18		838		110	48
Lactate dehydrogenase (IU/l)	393		894		760	220
Fibrinogen (mg/dl)			136			
D-dimer (ng/ml)			720			
Ferritin (ng/ml)	362				922	
ESR (mm/h)	90				58	
C-reactive protein (mg/l)	48		56			21

The reference ranges of laboratory parameters for adults: WBC: 4,500–11,000 per microliter; haemoglobin: 12.0–15.5 grams per deciliter; platelet count: 150,000–400,000 platelets per microliter; blood urea nitrogen: 7–20 mg/dl; creatinine: 0.59–1.04 mg/dl; prothrombin time: 10–13 seconds; international normalized ration (INR): 0.8–1.1; activated partial thromboplastin time: 30–40 seconds; aspartate aminotransferase: 0–35 IU/l; alanine aminotransferase: 19–25 IU/l; lactate dehydrogenase: 140–280 IU/l; fibrinogen: 200–400 mg/dl; D-dimer: <250 ng/ml; ferritin: 12–150 ng/ml; erythrocyte sedimentation rate (ESR): 0–20 millimeters per hour; C-reactive protein: 0–10 mg/l

Four of her children also had been recently tested positive for SARS-CoV-2 and received symptomatic treatment (intrafamilial transmission).

Bilateral peripheral ground-glass opacities were detected in chest computed tomography (CT) scan suggestive of viral interstitial pneumonia. Supplemental oxygen therapy with an orofacial mask was prescribed at the time of admission. We could not administer remdesivir because of the estimated glomerular filtration rate (eGFR) of less than 20 ml/min. Low dose intravenous dexamethasone, ceftriaxone, pantaprazole as well as prophylactic subcutaneous unfractionated heparin were

administered for the patient. Previous anti-hypertensive medications were also prescribed on condition that her blood pressure increased.

The ultrasonography of the kidneys revealed a cortical cyst with a diameter of 9 millimetres in the upper pole of the left kidney and a 4 mm stone in the upper pole of the right kidney. Both kidney sizes were within normal limit with increased parenchymal echogenicity. The result of echocardiography showed left ventricular hypertrophy with an ejection fraction (EF) of 50%. At the end of the first week, she recovered from acute respiratory failure.

On day 9, the patient complained about an acute diffuse abdominal pain with a bulging in her left lower quadrant (LLQ). The abdomen was tender on examination and a firm tender mass was felt on the LLQ. No trauma had occurred and no physiotherapy had been done for the patient. The systolic blood pressure decreased

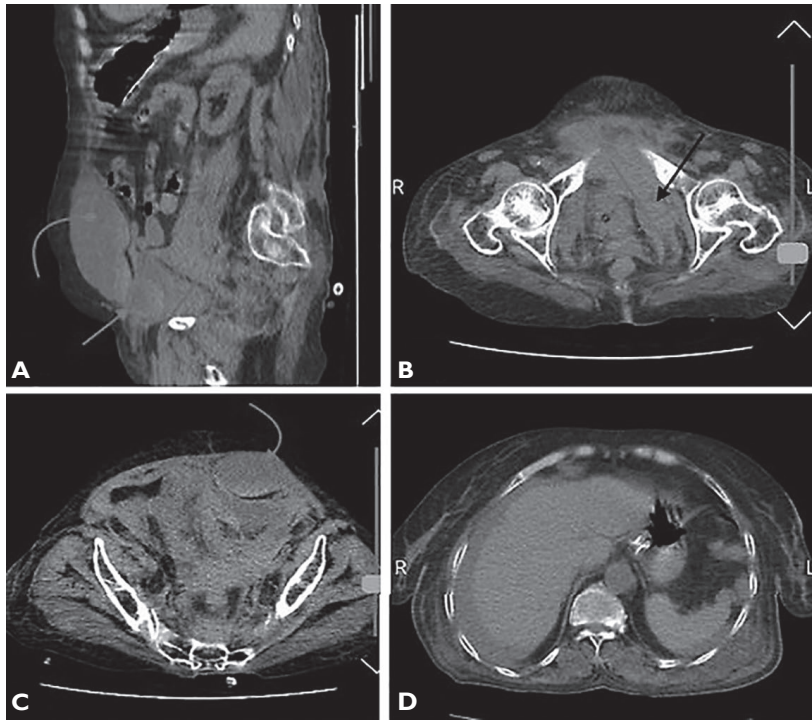


Figure 1 – Abdominal/pelvic computed tomography scan without contrast showing intramuscular haematomas. A) Sagittal view showing hyperdense fluid collection in left rectus muscle in favor of haematoma (curved arrowhead) and smaller haematoma in extraperitoneal space (direct arrowhead) with adjacent hyperdense free fluid in peritoneal space (direct line). B) Axial view which shows enlargement and faint hyperdensity of left obturator internus muscle extended to infra and supra pubic space. C) Axial view revealing haematoma in left rectus (arrowhead) with adjacent free fluid in peritoneal space (direct line). D) Axial view showing free fluid in perihepatic and perisplenic spaces.

to 80 mm Hg and the haemoglobin (Hb) dropped from 12.8 to 6.7 g/dl following the next few days.

The results of abdominal and pelvic ultrasound showed septated fluid collection susceptible of haematoma as well as small collections of fluid in perihepatic, and pelvic inter-loop spaces. Due to the low eGFR, abdominal and pelvic CT scans without contrast were performed which revealed haematomas in the left rectus (diameters of 106×49 mm) and obturator internus muscle (diameters of 45×23 mm). Signs of haemorrhage were seen in the anterolateral aspect of the bladder with extension to the paracolic spaces. Moderate collection of fluid was observed in both subdiaphragmatic, perihepatic and, perisplenic spaces (Figure 1).

Ecchymosis was first observed in her left groin and then gradually spread on her abdomen and back (Figure 2). The patient became febrile with diffuse abdominal and pelvic pain mainly in the LLQ. Gross hematuria and transient non-bloody diarrhea occurred next day after the onset of acute abdominal pain. She received intravenous fluid and overall 6 packed red blood cell until. The subsequent vital signs and Hb became stable and signs of hemostasis appeared. Surgical consultation was in favor of a conservative approach and continuation of supportive treatment. The white blood cells (WBC) count increased to 19,600 and then to a maximum of 26,500 per microliter (μ l), and the activated partial thromboplastin time (aPTT) increased to 110 seconds on day 10. As shown, alanine and aspartate aminotransferases raised to 838 and 514 IU/l, respectively on day 9 and platelet count drop to 65,000/ μ l on day 12.

Dose adjusted meropenem was administered in lieu of ceftriaxone. Prophylactic heparin was discontinued for a few days after stabilization of the patient's vital signs and normalization of the aPTT. The results of blood, urine; and stool cultures, creatine kinase-MB; and serologic markers for hepatitis B, C and human immune

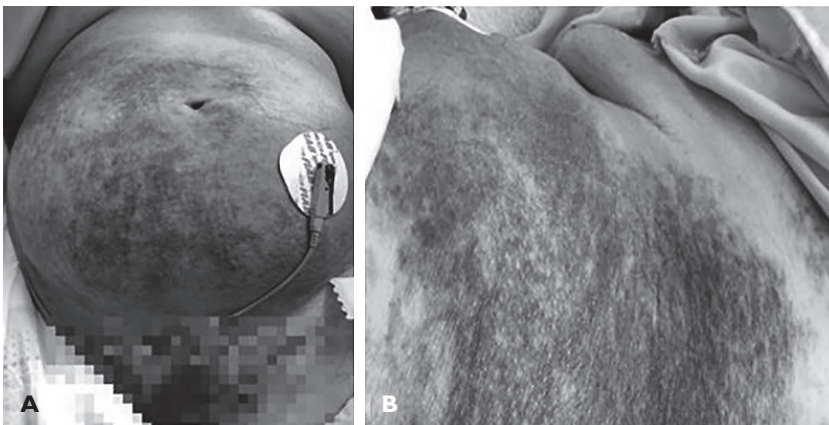


Figure 2 – The extension of subcutaneous haematomas in the abdomen (A), and back (B).

deficiency viruses were negative. Troponin checked four times during hospitalization showed negative results. The general condition of the patient improved thereafter.

At the end of the third week, the patient experienced an acute transient atrial fibrillation that was completely controlled by verapamil followed by metoprolol. Two days later, she was suspected to have deep venous thrombosis which was fortunately ruled out by Doppler ultrasonography. The general symptoms and laboratory tests began to improve. She was discharged from the hospital with improved Hb level (11.6 g/dl), blood urea nitrogen (BUN) = 19 mg/dl, creatinine = 1 mg/dl, WBC = 4,900/ μ l, platelet = 160,000/ μ l on day 25. On follow-up visit, ten days later, her general condition was good and recommended to be under the supervision of a cardiologist.

Discussion

Patients with severe COVID-19 seem to have an increased risk of bleeding as a result of imbalances in platelet production and disruption as well as disorders of the coagulation system. Our patient had both severe pulmonary and renal involvements due to COVID-19. On admission the patient had an eGFR of less than 20 ml/min/1.73 m² (BMI = 18.5 kg/m²) which showed she was a complicated COVID-19 case.

Bleeding is a common and potentially severe complication of acute and chronic renal failure. Patients with severe renal failure develop hemostatic disorders especially in the form of bleeding diatheses (Pavord and Myers, 2011; Lutz et al., 2014). Our patient did not have any history of chronic renal diseases and the risk factors for the progression of her disease were hypertension and hypertrophic cardiomyopathy as well as her age. Acute renal injury is one of the worse complications in COVID-19 patients that may mostly occur as a result of rhabdomyolysis, hypoxemia and dehydration (Pavord and Myers, 2011). Due to this severe complication, all the medications administered for our patient were adjusted based on the eGFR.

The sudden drop of blood pressure and haemoglobin as well as the occurrence of sudden abdominal pain and bulging in LLQ and subsequently the appearance of ecchymosis in the groins, abdomen and back made the diagnosis of internal bleeding due to COVID-19 more probable in this patient. The appearance of haematomas in abdominal/pelvic ultrasonography and CT scan confirmed this phenomenon. We did not have the facilities for angiography and embolization in our hospital and we could not transfer the patient to another center because of her critical condition either. Fortunately, the general conditions of the patient improved with supportive care after three days. During this critical condition the laboratory data showed the signs of acute inflammation and increased consumption including lower platelet count and fibrinogen; and increased WBC count, CRP (C-reactive protein), ESR (erythrocyte sedimentation rate), D-dimer, LDH (lactate dehydrogenase), ferritin, and aminotransferases.

Mattioli et al. (2020) reported bilateral neck and upper chest subcutaneous haematomas with painful swelling in a confirmed COVID-19 man, one week after his admission. A CT scan revealed bilateral and asymmetric haematomas of the sternocleidomastoid muscles. The patient had initial temporary renal impairment with thrombocytopenia and was on aspirin and low molecular weight heparin which could probably be a suggestion for the aggravation of the haemorrhagic complication (Mattioli et al., 2020). Nakamura et al. (2021) reported two confirmed COVID-19 patients treated with anticoagulants that developed haematoma in iliopsoas muscles. They suggested in patients with COVID-19, severe flank pain along with anemia and hypovolemic signs should be investigated for internal bleeding by performing a CT scan (Nakamura et al., 2021).

Besides thrombotic complications, bleeding is an important cause of morbidity in COVID-19 patients and the overall bleeding rate was estimated about 4.8% of the cases. It mostly occurred as a result of disseminated intravascular coagulation and thrombocytopenia (Al-Samkari et al., 2020).

D-dimer elevation at the time of admission was predictive of bleeding, thrombosis, critical illness and death in COVID cases (Shah et al., 2020; Moreno et al., 2021).

Conclusion

Bleeding tendency can occur in patients with COVID-19 but several others factors including complicated acute renal failure as well as prophylactic anticoagulant to prevent thrombosis can intensify the haemorrhage. Therefore, close supervision and proper management are recommended for complicated COVID-19 patients at risk of severe bleeding.

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