

CASE REPORT

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Superior Mesenteric artery thrombosis as a possible presenting complication of COVID-19**● Mohammed Talaat Rashid¹, ● Waleed Askar², ● Ahmed Gaafar¹,
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Abstract

COVID19 is the designated name given by the WHO for the corona virus disease caused by the virus SARS-COV-2 that was initially identified in the late 2019 and progressed to be a world pandemic. Patients with COVID-19 may have a wide range of coagulation abnormalities (in the direction of an underlying hypercoagulable state), raising questions about appropriate evaluations and interventions to prevent or treat thrombosis. Hypercoagulable state associated with COVID-19 has been repeatedly reported. The prevalence of venous thromboembolism is increasing, especially in the critically ill patient in spite of prophylactic use of anticoagulation. [1-3]. Arterial thrombosis has also been reported but the prevalence is not known. [3]. In this case report, we present a 37 years old man who suffered an acute abdomen due to superior mesenteric artery thrombosis as a possible complication of the COVID-19.

Keywords: COVID-19, Superior mesenteric artery thrombosis, acute abdomen, hypercoagulability**Introduction**

Madina is one of the highest 3 cities of prevalence of new COVID-19 cases though out Saudi Arabia. History of visiting Madina gives 3 points in the Saudi CDC triage scoring system (any patient with score of 4 or more should be considered as potentially infected as per the Saudi CDC).

On 29th April 2020, a 37 years old male, Indian construction worker, presented to our emergency department complaining of severe abdominal pain that has been worsening for almost 5 days with repeated visits to other hospitals. Pain was severe with score of 10 as per the patient, dull, central and upper abdominal associated with nausea and vomiting. Patient described absolute constipation for 2 days before presentation.

Case report

The patient has no past medical history. He denies any embolic or thrombotic events. There is no history of atrial fibrillation, valvular disease, PE or MI. The patient is non-smoker and doesn't have any positive family history of any relevancy.

The patient was borderline haemodynamically. His BP was 130/80 mmHg, HR 120-130 BPM, RR 24 Temp 37.8 C and Capillary refill time is 2 seconds. He looked ill and anxious. Chest examination was not conclusive, and the abdomen examination showed the hallmark of generalized tenderness and rigidity especially the upper and central part. Intestinal sounds were absent, and feculent odour of his breath was noticed.

ECG was normal except for sinus tachycardia. Laboratory workup showed: Blood gases revealed compensated metabolic acidosis, CBC showed WBCs 24 x10⁹/L, Hb 14.5 g/dL, HTC 45.3% and platelets 272 x10⁹/L. D-dimer was highly elevated.

The patient received IV fluid resuscitation, IV short acting potent pain killer in the form of fentanyl and IV antibiotics as per the hospital antibiogram in the form of Ceftriaxone and metronidazole.

NGT returned feculent secretions. Digital rectal examination revealed empty collapsed rectum. CT abdomen and pelvis with oral and IV contrast was requested, and surgical consultation was done.

CT revealed superior mesenteric artery proximal part is distended and totally occluded by intramurally hypodense thrombus that extends for about 6 cm distally denoting the diagnosis of Superior mesenteric artery thrombosis. The lower chest cuts were surprising.

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The radiologist reported a panic result to the emergency physician as he also reported bilateral subpleural ill-defined areas of ground glass opacity and right basal subpleural consolidation patch highly suggestive of COVID-19. Upon these chest CT finding, a nasopharyngeal swab for COVID-19 was requested. POCUS Echo was done and didn't show any valvular lesion, thrombi or signs of PE.

Emergency admission for operative surgical exploration was done. Patient was explored on the same day; midline incision was done revealed omentum covering all intestines. Large segment of gangrene affecting about 1.5 meters of jejunum with thick thrombosed mesentery reddish exudates in abdomen. All remaining viscera are in good condition, so the decision was to do resection anastomosis for the gangrenous jejunum of small intestine using staplers and ligatures device with 5000 iU intraoperative Heparin IV.

On 30th April 2020, the result of the swab was positive for COVID-19. Patient started the approved Saudi protocol for COVID-19 (Hydroxychloroquine and Azithromycin) for 7 days.

Patient opened his bowel after three days and start oral liquid then semi solid then Normal food. While admitted, Protein C, Protein S as well as Factor V Leiden were within normal.

On 8th May, COVID-19 swab became negative, Rivaroxaban started eight days after admission and Enoxaparin was discontinued and Patient was discharged.



Figure 2. Scanned lung bases show bilateral peripheral sub-pleural ill defined areas of ground glass opacities and right basal sub-pleural consolidation patch.



Figure 1. Sagittal view of a CT abdomen with IV contrast showing the superior mesenteric artery proximal part is distended and near totally occluded by intraluminal hypo-dense thrombus extending for approximately 6 cm

Discussion

It was noticed that the community of foreign construction workers in Saudi Arabia has recorded a very high infection spread rates due to low socioeconomic status as well as the suboptimal housing circumstances especially during the curfew that was in sometimes up to 24 hours daily. This factor was significantly improved after the governmental corrective action plan to allow them to use the schools as a temporary alternative housing sites until their companies improve their housing.

Classically, Arterial thrombosis occurs at areas of severe narrowing mostly due to atherosclerosis. Acute thrombosis of the mesenteric circulation often occurs as a superimposed phenomenon in patients with a history of chronic mesenteric ischemia from progressive stenosis due to atherosclerotic aortic plaque that involves the takeoff of the celiac axis and SMA, also referred to as acute-on-chronic ischemia [4]. This patient did not have any of these risk factors and the only factor was being COVID-19 confirmed case. Thrombotic occlusion usually appears as thrombus superimposed on a heavily calcified occlusive lesion at the ostium of the SMA while this patient CT didn't reveal any calcification or narrowing of the SMA or celiac trunk.

High index of suspicion is needed for patients complaining of acute abdominal pain especially in the COVID-19 era. Early symptoms and clinical signs, including laboratory studies and plain radiographs, are nonspecific, but any patient with acute-onset abdominal pain, described as pain out of proportion to the exam, and metabolic acidosis should be regarded as having intestinal ischemia until proven otherwise [5].

Hypercoagulability pathogenesis in COVID-19 is not yet completely understood. COVID-19 is associated with a hypercoagulable state associated with acute inflammatory changes and laboratory findings that differs from acute disseminated intravascular coagulation (DIC). Fibrinogen and D-dimer levels are increased, with typically only modest prolongation of the prothrombin time (PT) and activated partial thromboplastin time (aPTT) and mild thrombocytosis or thrombocytopenia [1-3,6].

The risk for venous thromboembolism (VTE) is markedly increased, especially in critical patients in the intensive care unit (ICU), with case series reporting prevalences of 25 to 43 percent in ICU patients, often despite prophylactic-dose anticoagulation. The risk for other thrombotic events (stroke, microvascular thrombosis) is less clear [5,6,9].

All patients admitted to the hospital for COVID-19 should have a baseline complete blood count (CBC) with platelet count, PT, aPTT, fibrinogen, and D-dimer. Repeat testing is done according to the patient's clinical status. Outpatients do not require coagulation testing. The main purpose of this testing is to obtain prognostic information that may be used to inform level of care [3].

Imaging studies are appropriate for suspected VTE if feasible. Laboratory abnormalities that are not typical of COVID-19 should be further evaluated [2,9].

Management is challenging due to the acuity of the illness and a paucity of high-quality evidence regarding efficacy and safety of different approaches to prevent or treat thromboembolic complications of the disease [7]. One of the suggested approaches includes:

All inpatients should receive thromboprophylaxis unless contraindicated. Low molecular weight (LMW) heparin is preferred, but unfractionated heparin can be used if LMW heparin is unavailable or if kidney function is severely impaired. Some institutional protocols include more aggressive anticoagulation with intermediate-dose or even therapeutic-dose anticoagulation for thromboprophylaxis.

Therapeutic-dose (full-dose) anticoagulation is appropriate to treat deep vein thrombosis (DVT) or pulmonary embolism (PE), unless contraindicated [10,12].

Bleeding is unusual but can occur. If it occurs, treatment is similar to non-COVID-19 patients and may include transfusions, anticoagulant reversal or discontinuation, or specific products for underlying bleeding disorders [10-11].

Participation in clinical trials is encouraged in order to improve understanding of the most effective and safest means of preventing and treating thrombotic complications of COVID-19. Disease-specific therapies under investigation may impact thrombotic risk, but the effects of these treatments on hemostasis in this patient population have not been well documented.

Conclusion

Hypercoagulable state associated with COVID-19 has been repeatedly reported. The prevalence of venous thromboembolism is increased, especially in the critically ill patient in spite of

prophylactic use of anticoagulation. A high level of clinical suspicion is needed for the diagnosis of mesenteric ischemia, especially in patients with known risk factors. Rapid diagnosis is essential among patients with clinical features and risk factors suggestive of acute intestinal ischemia to reduce the potential for intestinal infarction. Any patient with abdominal pain out of proportion and metabolic acidosis should be suspected for mesenteric ischaemia. In this case, the patient didn't have any risk factor for SMA thrombosis except the hypercoagulability associated with being COVID-19 positive.

Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

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Ethical approval

Don't have anything to declare and the authors have the approval from the concerned committee in the hospital to publish the case.

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