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Gastric ulcers with upper gastrointestinal bleeding in patients with severe SARS-CoV-2

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ABSTRACT

A new coronavirus, SARS-CoV-2, was identified earlier this year and spread rapidly globally. The clinical manifestations that it produces have gradually become known and the typical clinical picture is respiratory. Although gastrointestinal symptoms have been described in several communications, information on endoscopic findings in these patients is practically zero. We describe two cases of upper gastrointestinal bleeding in patients with COVID-19. In both cases, the presence of gastric ulcers was identified in an unusual location, the gastric fundus. After ruling out malignancy, our suspicion was an ischemic etiology that is consistent with terminal gastric vascularization at the gastric fundus level and increased thrombotic phenomena in patients with COVID-19.

Keywords: SARS-CoV-2. Gastric ulcers. Thrombotic phenomena.

INTRODUCTION

A new coronavirus (SARS-CoV-2) causing the disease known as COVID-19 appeared at the beginning of 2020 and spread globally, causing a pandemic (1). The typical clinical picture consists of fever and respiratory symptoms. However, some patients also present gastrointestinal manifestations (1).

SARS-CoV-2 has the glycoprotein S in its structure that has affinity for the angiotensin 2 converting enzyme (ACE2) receptor, which can be found in human cells in various tissues. The junction of both allows the virus to enter inside the cell (1). In the gastrointestinal tract, there is a high expression of ACE2 in the small intestine, colon, rectum and the gallbladder (2).

A high rate of venous and arterial thromboembolic events, from deep vein thrombosis to pulmonary thromboembolism and acute coronary syndromes have been described in patients with COVID-19 (3,4). We present here two cases with SARS-CoV-2 infection and an unusual finding, upper gastrointestinal bleeding due to high gastric ulcers located in the fundus, which could be due to microvascular thrombotic phenomena.

CASE REPORT 1

We present the case of a 58-year-old female with no medical history of interest except for high blood pressure and overweight. She had fever and cough for one week with basal desaturation of 60 % and severe hypoxemic respiratory failure in the arterial gasometry. A chest X-ray showed multiple bilateral diffuse infiltrates of peripheral predominance, compatible with extensive atypical pneumonia by COVID-19 and the nasopharyngeal exudate polymerase chain reaction (PCR) was positive for SARS-CoV-2. The patient was admitted to the Intensive Care Unit (ICU) with a slow but favorable evolution after 16 days. She presented melena and acute anemia with a hemoglobin level of 6.7 g/dl (fall of almost four points from the previous determination). Gastroscopy was performed and a 3 cm ulcer was identified in the fundus that was biopsied (Fig. 1A). At first, a malignant etiology was suspected but was not subsequently confirmed (Fig. 1B). Imaging tests (computed tomography scan) did not show any additional findings. Endoscopic monitoring of the ulcer was performed,

confirming an improvement and healing in the successive controls (Fig. 2).

CASE REPORT 2

A 66-year old male with no medical history of interest except for high blood pressure was admitted with a diagnosis of bilateral pneumonia by COVID-19 and a positive PCR for SARS-CoV-2. The patient experienced a progressive worsening with respiratory failure that did not respond to non-invasive measures and he was transferred to the ICU. During admission, the patient presented melena with anemia. The gastroscopy showed erosive pangastritis with multiple millimetric ulcers scattered throughout the gastric chamber but none were susceptible to endoscopic treatment. A few days later, blood started leaking from the nasogastric tube. A new gastroscopy was performed showing erosions probably due to the nasogastric tube. Upon close inspection, an area of irregular juxtacardial mucosa was observed in the fundus, suggesting a previous ulceration area (Fig. 3). The patient had multiple organ dysfunction, culminating in their death.

DISCUSSION

Throughout the course of the disease, 10 to 20 % of patients with COVID-19 may present gastrointestinal manifestations (1). The importance of digestive symptoms lies in the fact that they do not only complement the respiratory clinical feature but can be the debut of the disease. Hence, we need to know about these symptoms for an early identification and treatment, as some studies show that the presence of digestive symptoms implies a poor prognosis of the disease (5,6).

The most frequent gastrointestinal symptoms are diarrhea, nausea/vomiting and abdominal pain (1,4). However, upper gastrointestinal bleeding is infrequent, with very few reported cases (7,8). In a recently published series, Gadipathi C et al. (7) describe three cases of gastrointestinal bleeding, two were upper gastrointestinal bleeding. However, no endoscopic study was performed, therefore the etiology of the bleeding could not be identified. We have only found one case of upper gastrointestinal bleeding in which gastroscopy was performed, where erosions and superficial millimetric esophageal ulcers were identified as the cause of the bleeding, which were

biopsied with a positive result for SARS-CoV-2 (8). We have no documented literature on gastric ulcers located in the fundus in patients infected by COVID-19.

The anatomopathological study of lung biopsies and autopsies performed on patients affected by COVID-19 showed the presence of microvascular thrombosis, not only in the pulmonary territory but small vessel thrombosis has also been described in multiple organs of infected patients (9). From the pathophysiological point of view, there are two hypotheses that could explain the appearance of proximal gastric ulcers in the location described in both cases presented. The first one would be due to a cytotoxic effect of the virus on the gastric mucosa. This seems less probable since the viral receptor ACE2 is more frequent in the small (10) and large intestine, with a lower expression in the esophageal and gastric mucosa (2), although it has also been found in the latter locations (8). The second hypothesis is that the ulcer is of an ischemic origin due to thrombosis of the terminal circulation in the gastric region. This seems more likely given the increased risk of thromboembolic events in SARS-CoV-2 infection (3,4) and the anatomy of the gastric arteriovenous circulation.

The stomach is vascularized by the right and left gastric arteries, coming from the celiac trunk, that irrigate the minor gastric curvature. The right gastroepiploic artery branch of the gastroduodenal irrigates the distal major gastric curvature and antrum. The left gastroepiploic artery branch of the splenic artery irrigates proximal major gastric curvature and gastric fundus. The gastric veins adopt the arrangement of the arteries (11). Microvascular thrombosis at the level of the left gastroepiploic artery or vein, which irrigates the gastric fundus, could lead to an ischemic ulcer in this less vascularized area.

CONCLUSION

Upper gastrointestinal bleeding is a rare manifestation of SARS-CoV-2 infection. The few cases described have occurred in critical patients, usually admitted to an Intensive Care Unit. There was no endoscopic study due to the baseline situation of the patients and limitations due to the disease. Both cases presented had a severe form of the disease with a documented upper gastrointestinal bleeding by gastroscopy that showed findings related to the viral disease.

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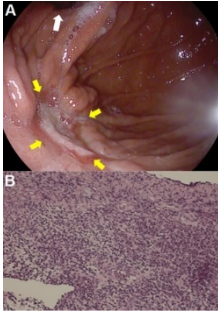


Fig. 1. Endoscopic retroversion vision (white arrow) of a fibrinous ulcer with amputated folds in the gastric fundus (yellow arrows). B. Magnification section x400 with hematoxylin eosin staining of the ulcer fundus with the absence of foveolar epithelial cells, as well as edema and intense inflammatory infiltration without cellular atypia.

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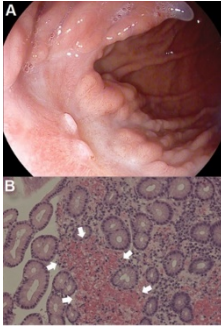


Fig. 2. A. Endoscopic monitoring at five weeks with resolution of the ulcer. B. Histological section at x200 magnification showing non-specific inflammation of the gastric mucosa with small superficial micro-hemorrhage (white arrows).

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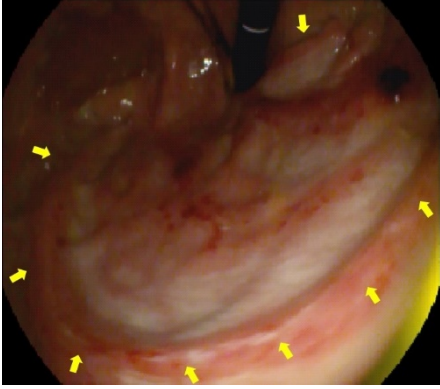


Fig. 3. Endoscopic view in retroversion with a finding of irregular mucosa and a scarred aspect in the gastric fundus, erythematous and raised edges (yellow arrows), suggestive of previous ulcer area currently in the healing phase.

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