



## Mesenteric Venous Thrombosis Due to Coronavirus in a Post Roux-en-Y Gastric Bypass Patient: a Case Report

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Received: 17 December 2020 / Revised: 30 December 2020 / Accepted: 30 December 2020 / Published online: 8 January 2021  
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Dear Editor,

The coronavirus disease 2019 (COVID-19) has already infected over 50 million people worldwide. The disease is well known for its effects on the respiratory system, and it is also a major risk factor for the development of deep vein thrombosis (DVT). DVTs have been reported in 18.2% of patients requiring admission to the intensive care unit with COVID-19 [1]. Obesity is a risk factor for the development of DVT [2], and over 2% of patients who have a bariatric operation will develop a VTE within 6 months of surgery [3]. Therefore, during the ongoing pandemic, our patients are at great risk of developing a venous thromboembolism (VTE).

Acute mesenteric ischaemia has been reported in patients admitted to the intensive care unit with COVID-19 [4]. Worryingly, portal vein thrombosis has been the first presentation of COVID-19 in an otherwise fit and healthy patient [5]. When a post Roux-en-Y Gastric Bypass (RYGB) patient presents to the emergency department with an acute abdomen, surgeons are always worried about the potential for an internal hernia [6]. This usually warrants a lower threshold for a surgical approach in cases of diagnostic uncertainty or persistent symptoms without any other apparent cause.

However, during the COVID-19 pandemic, bariatric surgeons should also be aware of another potential cause of acute abdomen in a post RYGB patient suffering from COVID-19. This condition does not need surgery and should be kept in mind to avoid unnecessary surgical intervention on a COVID-19 patient with severe consequences for the patient as well as potential risk to the healthcare personnel involved [7].

We would seek your permission to present here a patient who developed COVID-19 on the background of a previous RYGB and presented to us with an acute abdomen due to mesenteric venous thrombosis (MVT). Knowledge of this may help other patients and doctors in a similar situation.

A 36-year-old lady was brought to the emergency department by ambulance, suffering from 24 h of epigastric pain radiating through to her back with nausea. Her bowels were still opening, and she was able to eat and drink. Her past medical history included a laparoscopic RYGB 31 months prior, asthma and depression. She had previously carried three pregnancies to term without any thrombotic complications. She is a frontline healthcare professional and was diagnosed to be suffering from COVID-19 with a positive swab for SARS-COV-2 virus, 6 days prior to admission.

On admission, vital signs were stable; her early warning score was 0 and her pain score was 8/10. Blood tests were also normal: WCC 9.65, Hb 122, Creatinine 45, CRP 1.2 and lactate of 0.7. On examination, she had a soft abdomen with tenderness in her upper quadrants. A CT scan was performed due to her significant levels of pain to exclude an internal hernia.

The CT scan demonstrated an abrupt cut-off of the SMV in the proximal portion suggestive of occlusion (Fig. 1). This is in stark contrast to a CT scan performed in February 2020 (Fig. 2). Furthermore, there was diffuse infiltration of the mesentery suggestive of mesenteric oedema and wall thickening in the small bowel; she was therefore admitted for an IV heparin infusion. She remained vitally stable throughout her admission and was converted to 18,000 units of dalteparin once daily subcutaneously 72 h following admission. She was discharged from hospital on this treatment, under guidance from haematology.

At her haematology outpatient follow up, 1-month post discharge, her abdominal pain had resolved, and she tested negative for Janus Kinase 2 (JAK-2), Calreticulin (CAL-R), and MPL. Mutations in these genes can indicate myeloproliferative neoplasms including polycythemia vera, essential thrombocythemia,

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**Fig. 1** Coronal section of a CT scan on admission demonstrating an abrupt cut-off of the proximal portion of the SMV and mesenteric oedema

and primary myelofibrosis. She also tested negative for lupus, anti-phospholipid syndrome, and paroxysmal nocturnal haemoglobinuria. She has been kept on SC Dalteparin and will likely require this until October 2020.

MVT most often presents with abdominal pain out of proportion to the clinical examination, nausea, vomiting and melena [8]. Given that obesity, cardiovascular disease, and prolonged immobilisation, are significant risk factors for the



**Fig. 2** Coronal section of a CT scan from February 2020 demonstrating normal post RYGB anatomy

development of thrombotic events, the pro-thrombotic properties of COVID-19 leaves bariatric surgery patients particularly vulnerable. There are multiple nonspecific gastrointestinal symptoms that have been reported with COVID-19, including nausea, vomiting, diarrhoea, abdominal pain, and deranged LFTs [9].

We would caution all colleagues reviewing bariatric patients with abdominal pain to recognise the possibility of a mesenteric venous thrombosis in the current situation. Given our patient's presentation, we had a high clinical suspicion for an internal hernia and were incredibly surprised to discover an MVT. Contrast-enhanced CT scanning is the diagnostic modality of choice for MVT; a filling defect in the mesenteric vein is the most common finding [8]. It should be noted, however, that mesenteric venous thrombosis without a portal vein thrombosis is more difficult to diagnose on CT scanning [10].

Thromboprophylaxis with low molecular weight heparin is recommended for all hospitalised patients with COVID-19. In a patient with a confirmed MVT, anticoagulation with unfractionated or low molecular weight heparin should be initiated as soon as possible to improve survival and allow for venous recanalization. Patients who develop worsening symptoms or who develop a perforation or peritonitis may require surgical intervention, in which case the necrotic bowel is resected, and an anastomosis is performed [8].

The British Thoracic Society currently recommend for anticoagulation medication to continue for three months, however longer-term therapy may be indicated in the event of significant, chronic thromboembolic disease [11]. They recommend low molecular weight heparin in patients who commence anticoagulation during the inpatient stay and advise that it is reasonable to switch to a direct oral anticoagulant on discharge.

Although there have been several case reports of mesenteric, portal, and splanchnic venous thromboembolism in the scientific literature, to our knowledge this is the first case of mesenteric venous thromboembolism in a gastric bypass patient. We would like to make clinicians dealing with such patients aware of this as a potential complication of COVID-19 for appropriate management.

**Acknowledgements** We would like to thank and acknowledge the patient who has allowed us to present their case as a case report for the medical literature.

### Compliance with Ethical Standards

**Ethics** We have received written confirmation from that patient that they consent to have their case discussed anonymously in this case report.

**Consent** Mr. Mahawar obtained informed, verbal consent from the patient who we have discussed in this case report. We have included a redacted clinic letter as evidence of this.

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