

The thin red line: ileal angiodysplasia versus SARS-CoV-2-related haemorrhagic enteritis

We report the case of a female patient, aged between 50 and 60 years old, who presented with mechanical ileus sustained by intra-peritoneal adhesions. Her medical history was characterised by a transanal, endorectal pull-through for Hirschsprung's disease of the left colon during her infancy; moreover, she underwent bilateral ovarian resection for pelvic abscess. These previous surgeries caused multiple hospitalisations for recurrent intestinal occlusions, two of which requiring surgical laparotomic adhesiolysis.

The patient presented to the emergency department having abdominal pain, bloating and vomiting, associated with bowel not opened to faeces in the past 48 hours. Blood examinations were unremarkable except for a slight leucocytosis (white cell count $13 \times 10^9/L$). Arterial blood gas analysis revealed a pH and lactate levels within the normal range. Contrast-enhanced abdominal CT scan confirmed the small bowel distension associated with an ileal transition point with reduction in bowel calibre and diffused intraperitoneal free fluid.

Given the clinical stability and laboratory tests almost unremarkable, we initially attempted a conservative treatment by means of a nasogastric tube and the administration of Gastrografin. However, 36 hours later, this latter manoeuvre caused an important paradoxical diarrhoea with important fluid and electrolyte loss, leading to hypovolaemic shock.

Given her clinical condition, once restored the haemodynamic stability, 48 hours after the gastrografin administration, the patient underwent an urgent explorative laparotomy with extensive lysis of intraperitoneal adhesions and resection of a double adhesion band causing intestinal obstruction in two separate portions of the small bowel.

Since our institution requires to perform a nasopharyngeal swab for SARS-CoV-2 detection before any admission into the OR, the patient was tested negative for the virus.

On the sixth postoperative day, the patient experienced several, escalating episodes of intestinal bleeding causing a progressive drop in haemoglobin levels.

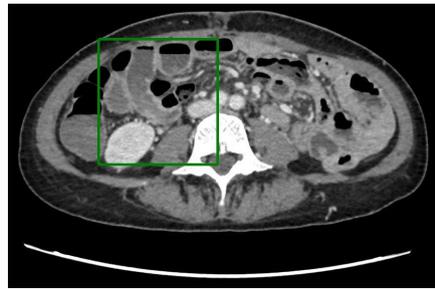


Figure 1 Angio-CT revealing the mid-ileal blushing.

Gastric and colonic endoscopic exploration did not point out any source of active bleeding. An angio-CT, instead, revealed the presence of a mid-ileal blushing, which was considered as the only possible source of bleeding (figure 1). A subsequent angiography revealed the origin of the blushing coming from an ileal angiodysplasia (figure 2). Despite conservative treatment, the patient's haemodynamic status needed massive fluid support and blood transfusions, therefore, requiring a selective embolisation of the angiodysplasia to stop the blood loss.¹

Between 48 and 72 hours after the embolisation, the postprocedural course was complicated by the onset of acute abdomen requiring a new urgent explorative laparotomy.

Intraoperatively, we confirmed the presence of segmental ileal ischaemia secondary to the previous embolisation (figure 3). These findings required a two-stage procedure with an initial segmental resection, followed by an open-abdomen approach. After 48 hours, the patient underwent a second surgical look which did not detect extension of the area of



Figure 2 Angiography revealing the blushing from ileal angiodysplasia.



Figure 3 Segmental ileal ischaemia.

ischaemia. The good perfusion of the ileal stumps was further confirmed with the use of indocyanine green fluorescence. Therefore, we were allowed to proceed with an ileo-ileal, latero-lateral, single-layer anastomosis. Histological examination of the resected specimen confirmed the chronic and acute inflammation associated with focal erosions, oedema and haematic leaks. The remaining margin was characterised by an extensive ulceration of the mucosa, together with focal, transmural inflammation and oedema. The specimen was eventually characterised by focal acute serositis. Similarly to the previous surgical intervention, the patient was tested for SARS-CoV-2 before being admitted to the OR, but this time she resulted positive.

During this second postoperative period, few other sporadic episodes of gastrointestinal bleeding occurred. However, a new angio-CT demonstrated a picture of diffused ileitis (figure 4). At this point, given the persistent positivity of the nasopharyngeal swab for SARS-CoV-2, the suspect of COVID-19-related enteritis was raised. Therefore, a faecal swab was performed and it tested positive for the presence of the virus. In the light of these new findings, the patient underwent conservative treatment with fluid support and steroids. We observed a progressive reduction of bowel bleeding events which were paralleled by a persistent negativisation of the nasopharyngeal and rectal swabs.



Figure 4 Angio-CT revealing diffused ileitis.

DISCUSSION

Although the respiratory system is the major target of SARS-CoV-2 infection, extrapulmonary manifestations of COVID-19 have been thoroughly described in the literature.² In particular, SARS-CoV-2-related gastrointestinal symptoms have been widely reported, ranging from aspecific abdominal pain up to the rarer gastrointestinal bleeding.^{3,4}

Our case presents many similarities with the one reported in this Journal by Amarpurkar *et al*⁵ and raises the awareness of haemorrhagic enteritis as a potentially fatal, yet little known, manifestation of SARS-CoV-2 infection.

Based on the aforementioned clinical scenario, we now believe that the gastrointestinal bleeding could have been sustained by a superimposition of factors, among which the ileal angiodysplasia on a generalised, and initially unknown, COVID-19-related ileitis.

In fact, once the initial source of bleeding was removed the patient experienced further gastrointestinal bleeding episodes. Moreover, the positivity of the faecal swab for SARS-CoV-2 confirmed the presence of the virus in the gastrointestinal tract. This strengthens the hypothesis that the origin of the blood loss came from a combination of the two factors mentioned above.

Therefore, raising earlier the suspicion of SARS-CoV-2-related enteritis could have prompted the prosecution of an effective conservative treatment, possibly avoiding unnecessary more invasive procedures. Fairly enough, the lack of pulmonary symptoms has made the diagnosis of COVID-19-associated enteritis more complicated.

Once more, by presenting this case, we would like to remark the intriguing decisional process that lead to the final diagnosis. Although rare, extrapulmonary manifestations of COVID-19 should be always taken into account while facing a SARS-CoV-2-positive patient.

Our case report, together with the growing body of evidence published in literature regarding extrapulmonary manifestations of COVID-19, underlines once more how gastrointestinal localisation of SARS-CoV-2, in the absence of pulmonary signs and symptoms, could be considered as a new, independent clinical entity developing within the framework of this pandemic.

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REFERENCES

- 1 Sami SS, Al-Araji SA, Rangunath K. Review article: gastrointestinal angiodysplasia - pathogenesis, diagnosis and management. *Aliment Pharmacol Ther* 2014;39:15–34.
- 2 Gupta A, Madhavan MV, Sehgal K, *et al*. Extrapulmonary manifestations of COVID-19. *Nat Med* 2020;26:1017–32.
- 3 Yeo C, Kaushal S, Yeo D. Enteric involvement of coronaviruses: is faecal-oral transmission of SARS-CoV-2 possible? *Lancet Gastroenterol Hepatol* 2020;5:335–7.
- 4 Konturek PC, Harsch IA, Neurath MF, *et al*. Covid-19-more than respiratory disease: a gastroenterologist's perspective. *J Physiol Pharmacol* 2020;71:1–11.
- 5 Amarpurkar AD, Vichare P, Pandya N, *et al*. Haemorrhagic enteritis and COVID-19: causality or coincidence. *J Clin Pathol* 2020;73:686.