injury from diathermy use.[1,3] Wound infection is also known to be a contributing factor.[3]

Once the patient develops the air leak, the condition might be aggravated by straining or coughing. The fascial envelop of the neck communicates with that of the chest and abdomen, as well as the face. When interstitial air accumulates in the soft tissue of the neck, it can progress to subcutaneous facial and mediastinal emphysema. The sequelae of this subcutaneous emphysema is usually self-limiting, with the absorption of the air usually complete within 2 weeks.[1] However, it can also be associated with serious complications including acute respiratory distress with airway compromise,[2] pneumothorax,[8] cardiac tamponade and tension pneumomediastinum.[9]

It is important to emphasize that care is needed to prevent thermal injury to the trachea at thyroid surgery. However, despite the extensive cervicofacial subcutaneous emphysema that can be associated with air leak, it usually takes a benign course. Where there is no respiratory compromise, air leaks can usually be managed non-operatively with simple advice to provide pressure to the neck while coughing.

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Beware of the acute bowel disease in COVID-19 patients

In our previous article, we reported a case of acute bowel disease as the atypical clinical presentation of coronavirus disease 2019 (COVID-19), providing some hypotheses to explain our findings.[1] Here, we report three further cases, which we observed during the early 2020 epidemic in the district of Bergamo (Italy).

An 85-year-old man presented to the emergency department (ED) with a history of dyspnoea and several episodes of bloody diarrhoea, fever and mild abdominal pain in the past 24 h.

His past medical history consisted of arterial hypertension, chronic atrial fibrillation, myocardial infarction in 2016 and a recent episode of uncomplicated sigmoid diverticulitis. His abdomen showed only diffuse mild tenderness at palpation.

His parameters at presentation were as follows: temperature 38.4°C, arterial pressure 125/80 mmHg, heart rate 86 bpm, oxygen saturation ($SatO_2$) 87% and respiratory rate 18 breaths/min.

Laboratory tests showed white blood cell (WBC) count of 14.22×10^9/L, haemoglobin (Hgb) 114 g/L and C-reactive protein (CRP) of 9.4 mg/dL.

Routine nasopharyngeal swab (NS) for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was positive while chest radiograph was normal.

The patient underwent sonography followed by contrast-enhanced abdominal computed tomography (CT) scan (Fig. 1), which revealed severe submucosal oedema extending from the caecum to the descending colon, with serosal and mucosal hyperaemia and pericolic fat stranding; mesenteric vessels were patent. At colonoscopy, mucosal hyperaemia and oedema with scattered ulcerations were found in the caecum and ascending, transverse and descending colon. Histology showed mucosal ulcerations with microhaemorrhages and focal vascular congestion, suggestive of acute ischaemic colitis.

The patient was hospitalized and successfully treated with oxygen therapy, hydroxychloroquine, darunavir/cobicistat, mesalazine and piperacillin/tazobactam.

He was discharged from hospital after 9 days with no symptoms.

A 72-year-old male presented to the ED with fever, fatigue and abdominal pain in the past 24 h, without dyspnoea. At palpation, tenderness was found in the left quadrants of his abdomen. He reported arterial hypertension and diverticular disease of the sigmoid colon in his past medical history.

His temperature was 38°C, arterial pressure 110/70 mmHg, heart rate 95 bpm, $SatO_2$ 97% and respiratory rate was 15 breaths/min. Laboratory tests showed slight signs of inflammation (WBC count 10.30×10^9/L, Hgb 132 g/L and CRP 10.7 mg/dL). The patient underwent NS which was positive and chest X-ray that was suggestive for interstitial pneumonia.

A contrast-enhanced CT scan showed diffuse bilateral ground-glass opacities in his lungs, compatible with COVID-19 interstitial

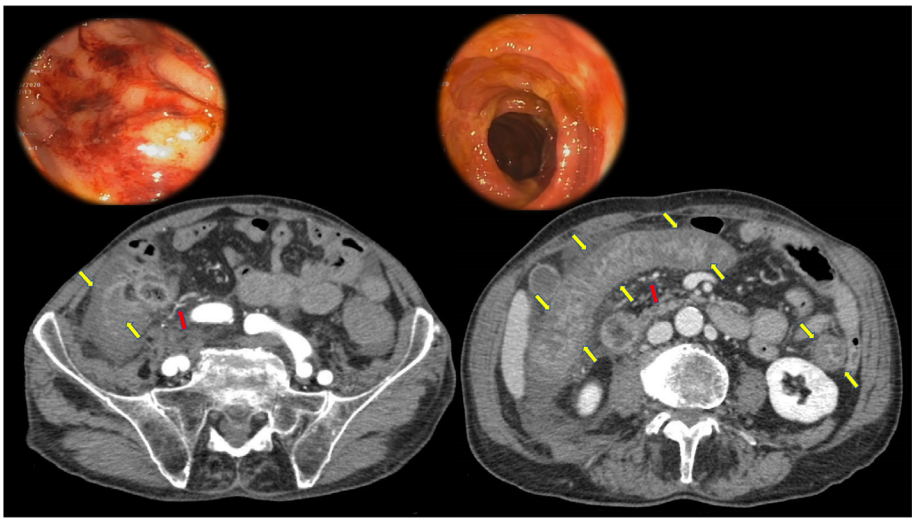

Fig 1. Computed tomography scan: colonic submucosal oedema with serosal and mucosal hyperaemia (yellow arrows), and patent mesenteric vessels (red arrows). Colonoscopy images are shown above.

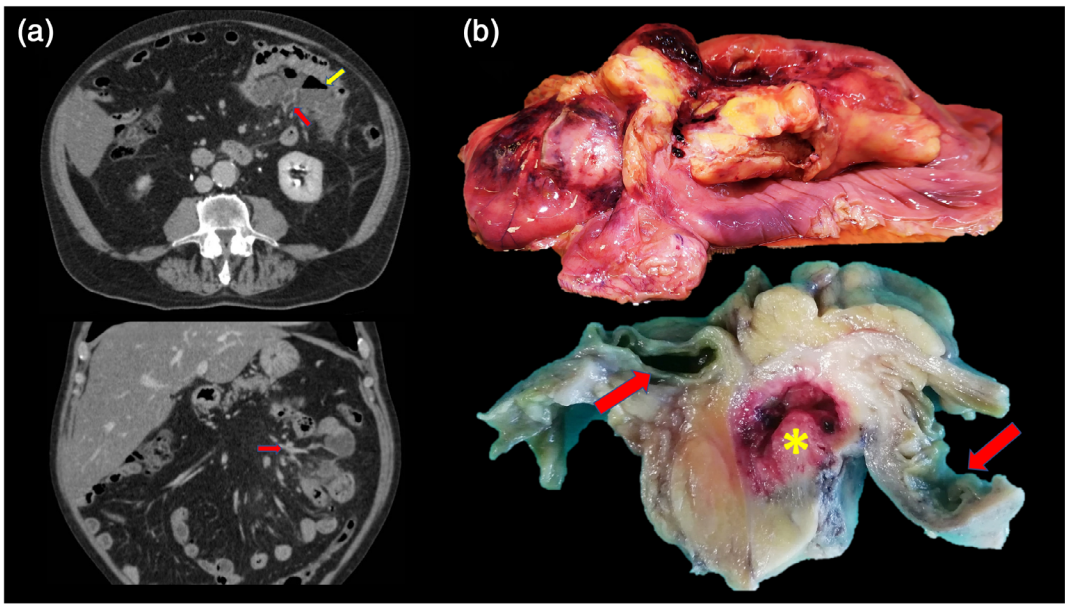

Fig 2. (a) A cluster of jejunal loops with submucosal oedema and mesenteric fat stranding, gas/fluid collection (yellow arrow) and patent mesenteric vessels (red arrows). (b) Fresh specimen (above): jejuno-mesenteric mass with normal mucosa, focal submucosal congestion and haemorrhage. Sectioned fixed specimen (below): single perforated jejunal diverticulum with haemorrhagic wall (asterisk) and non-inflamed diverticula (arrows).

pneumonia, while the abdominal scans revealed a cluster of jejunal loops with submucosal oedema and mesenteric fat stranding, surrounding a 6-cm collection suggestive of contained bowel perforation; mesenteric vessels were patent (Fig. 2a).

The patient was hospitalized and underwent surgery. A jejunal resection was performed. In his surgical specimen, a perforated jejunal diverticulum was found with necrotic-haemorrhagic wall, among others non-inflamed diverticula, mesenteric fat induration and necrosis, and multiple reactive lymph nodes with local haemorrhages (Fig. 2b).

The patient promptly recovered after surgery and was treated post-operatively with oxygen therapy, hydroxychloroquine, low molecular weight heparin (LMWH) and piperacillin/tazobactam.

A 63-year-old male presented to the ED with acute left leg pain, a history of fever, cough and dyspnoea in the previous 7 days. His past medical history was unremarkable. At presentation, temperature was 38.3°C, arterial pressure 140/90 mmHg, heart rate 90 bpm, $SatO_2$ 90%, respiratory rate 24 breaths/min, WBC count 12.72×10^9/L, Hgb 159 g/L and CRP was 17.3 mg/dL.

Chest radiograph was compatible with COVID-19 interstitial pneumonia and NS was positive. He was also diagnosed with critical ischaemia of the left lower limb and was submitted to popliteal artery thrombectomy. Admitted to the intensive care unit after worsening of his dyspnoea and desaturation and treated with continuous positive airway pressure, he underwent leg amputation the following day for failure of thrombectomy. His post-operative course was complicated by acute respiratory failure followed by myocardial infarction and left ventricular failure. After 2 days, a progressive onset of abdominal distension was noted. The patient underwent abdominal CT scan (Fig. 3)

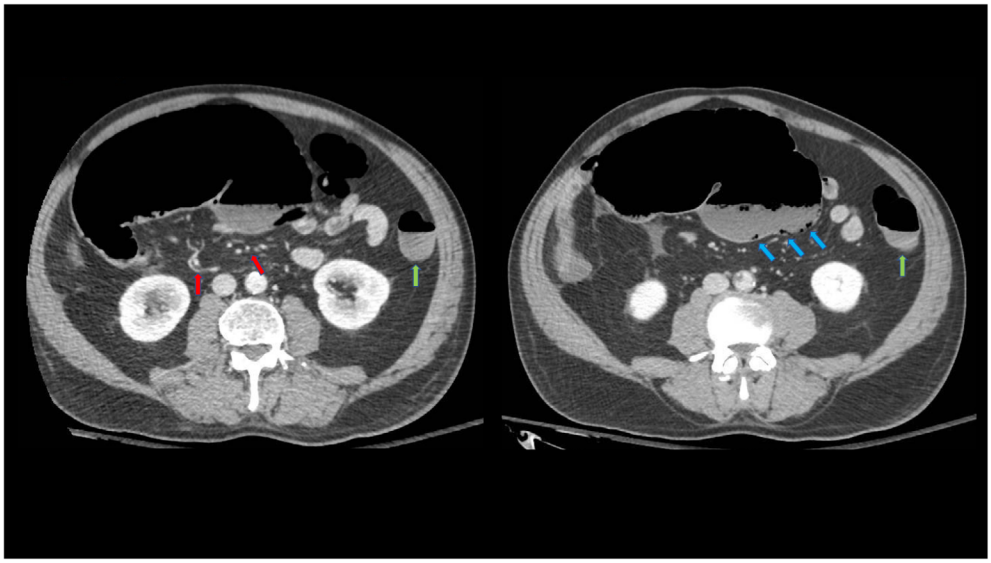

Fig 3. Marked dilatation of the caecum and ascending colon, with intestinal pneumatosis (blue arrows), patent mesenteric vessels (red arrows) and normal left colon (green arrows).

that revealed marked dilatation of the caecum and ascending colon, with intestinal pneumatosis and patent mesenteric vessels. The colonoscopy showed normal mucosa with atonic right colon. A colon decompression tube was inserted. Unfortunately, his clinical conditions progressively worsened and the patient deceased after 2 days.

The clinical manifestations of COVID-19 are multiform, and patients with abdominal symptoms should be thoroughly evaluated with bowel sonography, followed by CT scan and colonoscopy if necessary, because the abdominal examination often underestimates the severity of the eventual underlying disease.

Moreover, when COVID-19 patients need abdominal surgery, we encourage surgeons to investigate the intestinal blood flow intraoperatively (i.e. using fluorescence imaging), to look for intestinal vascular damage in surgical specimens and to perform microbiota and peritoneal fluid analysis whenever possible, to gain new significant data.

Author Contributions

Marco Lotti: Conceptualization; data curation; formal analysis; investigation; methodology; supervision; writing-original draft; writing-review and editing. **Michela Giulii Capponi:** Formal analysis; writing-original draft. **Stefano Magnone:** Data curation. **Luca Campanati:** Data curation. **alessandro lucianetti:** Data curation.

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COVID-19 pandemic consciousness: droplet contamination and aerosolization during pleural decompression

In response to the current coronavirus disease 2019 (COVID-19) pandemic, it has been argued that pleural decompression (PD) is an aerosol-generating procedure (AGP) and that personal protective equipment (PPE) provides adequate protection. Droplet transmission occurs when infectious droplets, generally greater than 5–10 μm, come in contact with another person's mucosa. Conversely, airborne transmission occurs via droplet nuclei or aerosols. An aerosol is a suspension of particles (such as a liquid or solid particle) within a gas.[1] We investigated this by simulating and mapping viral droplet contamination during PD and intercostal catheter (ICC) insertion in the setting of trauma to elucidate the hazard to the clinician during this pandemic.