Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Correspondence

Urgent surgery for inflammatory bowel diseases during the COVID-19 outbreak in a high incidence area - Experience from a high-volume centre

Dear Editor,

Since December 2019, a novel coronavirus named SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) was identified as the causative agent of a respiratory syndrome named COVID-19 [1]. During the following months, the virus rapidly spread around the world, until the World Health Organization (WHO) defined COVID-19 as a pandemic on 11 March 2020. Lombardy region was severely hit by COVID-19 since February 2020, posing serious challenges to healthcare system due to an extremely high number of simultaneous cases. Our hospital (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico) is a tertiary care university centre located in the centre of Milan and it is a referral centre for the treatment of inflammatory bowel diseases (IBD). In order to deal with the difficult scenario due to the pandemic, our hospital, like many others in Northern Italy, was deeply reorganized to ensure an adequate care for the huge number of COVID-19 patients. Almost all intensive care units (ICUs) were dedicated to COVID-19, new ICUs were created, and specialist departments, both medical and surgical, were reduced and merged into COVID-free wards. Because of such a rearrangement and according to national and international indications [2,3], only urgent surgical procedures were allowed, while elective surgeries were drastically reduced and limited to oncological cases [4]. As a tertiary referral centre for the surgical management of IBD patients, it was important to clearly define which complicated IBD cases were to be operated, by taking into account several variables including disease severity and quality of life, presence of comorbidities, feasibility of an alternative procedure. According to the British Society of Gastroenterology (BSG) guidelines on the IBD management during the COVID-19 pandemic [5], routine elective operations should be deferred, while emergency procedures (e.g. colectomy in acute severe ulcerative colitis [UC] or intestinal resection in septic complications of penetrating Crohn's disease [CD]) should continue. Complex surgical IBD cases should also be deferred when possible and its timing must be regularly reviewed at multidisciplinary meetings, trying to optimize medical treatment (e.g. using partial or exclusive enteral nutrition regimens or draining abscesses in combination with antibiotic therapy) and to avoid surgery or change the timing from emergency to urgent or semi-urgent. In the case of subacute obstructive symptoms, guidelines suggest the possibility to avoid or delay surgery by using partial or exclusive enteral nutrition regimens [5].

We hereby report our experience on surgical management of IBD patients as a high-volume centre located in a high-incidence region for COVID-19.

From the beginning of March 2020 until May 2020, 8 IBD patients (4 CD and 4 UC, mean age 41 years, M/F 6/2) were admitted to our hospital for an IBD-related urgent condition. All cases were handled by a multidisciplinary team including surgeons, gastroenterologists, and radiologists. One of them (an 18-year-old man) was treated conservatively after being discharged 2 weeks earlier from a non-referral centre, and then admitted to our surgical department for severe malnutrition and the presence of a pelvic abscess caused by CD. He was treated with total parenteral nutrition and antibiotic therapy with regression of the abscess, successful reintroduction of oral nutrition, and was discharged after 20 days of hospitalization.

The remaining 7 patients underwent surgical treatment; their characteristics are summarized in Table 1. Three of them (1 CD and 2 UC) were already followed-up by our IBD unit and an indication for surgery was already posed. During the lockdown period, they were monitored with regular contacts by phone or e-mail, until symptoms and clinical condition worsened, and the surgical approach could not be postponed further; at that point they were hospitalized. Three other patients (1 CD and 2 UC) were admitted from the emergency department because of an acute complicated presentation of IBD; the IBD was previously unknown in one case and already followed-up at our centre in 2 cases. The remaining patient, with CD, was referred to our unit from a non-tertiary hospital due to a rapid worsening of his IBD-related clinical condition.

For all 7 patients the timing of surgery was defined on the basis of how long surgery could be delayed without causing harm to the patient: less than 24 h (emergency), 1 to 2 days (urgency), or 3 to 7 days (semi or delayed urgency) [6]. Surgical indications and timing were as follows:

- a 19-year-old male UC patient underwent emergency surgery the same day of presentation. In January 2019 he received proctocolectomy with ileo pouch-anal anastomosis and protective loop ileostomy for severe UC, followed by the closure of the ileostomy in December 2019. Two months after the recanalization, a perforation of the pouch developed, that evolved into purulent peritonitis with septic shock: a new loop ileostomy was performed during the emergency intervention.
- two patients underwent surgery with urgency timing. A 36-year-old man was operated for evolution into toxic megacolon after failure of medical therapy (including rescue therapy with infliximab) for severe UC; a laparoscopic total colectomy with terminal ileostomy and closure of the rectum was performed. A 47-year-old women developed an acute intestinal obstruction due to a long (100 cm) CD-related stenosing ileal segment, which was resolved with a laparo-assisted 40 cm-long ileal resection and a 30 cm-long ileo-ileal anastomosis with atypical

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Table 1
Summary table with the main features of the 7 patients undergoing surgery for a IBD-related urgent condition.

Patient (Age, Gender)	Diagnosis	Type of admission	Days of hospitalization before surgery	Medical therapy before surgery	Timing of surgery	Type of intervention	Surgical technique	Diverting stoma	Complications
19 yrs, Male	UC (IPAA)	1	0	No	Emergency	Loop ileostomy	Open	Yes	No
36 yrs, Male	UC	1	15	TPN, steroids, infliximab	Urgency	Total colectomy	Laparoscopy	-	No
47 yrs, Female	CD	2	2	No	Urgency	Ileal resection	Laparoscopic assisted	No	No
27 yrs, Male	CD (previously unknown)	1	10	TPN, antibiotics	Delayed urgency	Right hemicolectomy	Open	No	Minor: delayed canalization
67 yrs, Male	UC	2	4	TPN, steroids	Delayed urgency	Total colectomy	Laparoscopy	-	No
54 yrs, Male	CD	3	2	No	Delayed urgency	Ileocaecal resection	Laparoscopic assisted	Yes, at reintervention	Major: anastomotic leak with septic shock
68 yrs, Female	UC	2	7	TPN, steroids	Delayed urgency	Total colectomy	Laparoscopy	-	No

1 = From emergency department; 2 = Electively after clinical worsening while awaiting elective surgery; 3 = Referred from a non-tertiary hospital.
UC, Ulcerative Colitis; IPAA, Ileal pouch-anal anastomosis; TPN, Total Parenteral Nutrition; CD, Crohn's Disease.

strictureplasty. Both these patients were operated after 2 days of hospitalization.

- four patients were operated with a delayed urgency timing. In a 27-year-old man with previously unknown IBD, an open right hemicolectomy was performed for severe inflammatory mass with deep abscess in the right flank, suspected for CD (at radiological end endoscopic examinations) and unresponsive to medical therapy. It was later confirmed as CD at histology. Two patients underwent surgery because of worsening of a pre-existing sub-occlusive state: in a 67-year-old man with long-standing UC, a laparoscopic total colectomy with terminal ileostomy was performed due to a colonic stenosis; a 54-year-old man with CD underwent a laparo-assisted ileocaecal resection for a stenosis of the ileocaecal valve. The remaining 68-year-old women, affected by UC, was treated with a laparoscopic total colectomy for rapid clinical worsening of a moderate-severe steroid-dependent disease; a terminal ileostomy was made.

All the 6 patients operated in the urgent and delayed urgent surgical setting were screened for COVID-19 before surgery. Two nasopharyngeal swabs for SARS-COV-2 were performed 24 h apart, along with a chest X-ray followed by a chest CT scan were appropriate [7]. None of these patients tested positive. They were operated in dedicated COVID-19-free surgical rooms and the surgical technique was the same as the one that would have been chosen in the pre-COVID era. Regarding the case of emergency surgery, it was not possible to wait for the result of SARS-CoV-2 swabs. Thus, the surgery took place in a dedicated room for COVID-19 patients, maintained at negative pressure and with a high frequency air exchange; furthermore, an open approach was preferred, instead of laparoscopic or laparo-assisted, according to the current international guidelines [8,9].

For all surgical patients, the choice to perform the protective ileostomy was not affected by the COVID-19 status.

Five out of the 7 surgical patients had a regular post-operative course and were discharged within 9 days after surgery. One patient experienced a delayed canalization after a laparotomic intervention, that prolonged the hospitalization and was discharged on day 12. The patient who received the laparo-assisted ileocaecal anastomosis developed a major surgical complication (anastomotic leak with peritonitis and septic shock) which required an urgent reintervention.

COVID-19 did not develop in any patient after hospital discharge over a 4-weeks follow-up period. All patients were followed-up for at least 2 months after surgery, during which no late surgical complications or early disease recurrence were observed. All physicians involved in the IBD management underwent regular SARS-CoV-2 swabs without any positive results.

The challenging scenario related to the COVID-19 outbreak has contributed to highlight the importance, for an IBD-referral centre, of having and maintaining an efficient integrated network with peripheral centres; this in fact allowed patients from neighbouring hospitals to be treated in a referral centre like ours, despite the difficulties related to the epidemic. The importance of multidisciplinary management of IBD patients must also be stressed. Multidisciplinary team is composed by surgeons, gastroenterologists, and radiologists with large experience in the management of IBD, and seems to be a key element for a successful treatment without overloading the hospital facilities in such difficult times. In our experience, this has led to avoid surgery whenever possible, or to define the optimal timing for surgery once needed. Moreover, urgency and delayed urgency timings allowed us to bring patients to surgery with a known negative COVID-19 status, with important implications in terms of logistical simplicity (i.e. using of COVID-free surgical rooms); it also allowed us to overcome the

COVID-19-related concerns about the use of laparoscopy and the risk of a primary anastomosis execution. Furthermore, the choice of the minimally invasive surgical technique was not affected. Our case series finally showed that the rate of surgical complications has been similar to the pre-COVID era, as reported by other experiences [10]. Overall, our experience can serve as an important example for other IBD referral centres, especially in the case of very challenging settings like the COVID-19 outbreak.

Declaration of Competing Interest

All authors have no conflict of interests or funding information to declare.

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