



Subtotal colectomy for refractory ulcerative colitis with COVID-19 infection; a first case report in Japan

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Abstract

We report a 60-year-old male who was transferred to our hospital for the operation because of refractory ulcerative colitis (UC). He was diagnosed to be infected with COVID-19 for SARS-CoV-2 PCR test positive at the time of transfer. We determined emergency operation because his general condition was poor such as malnutrition and ADL decline due to exacerbation of UC and air embolization by central venous catheter removal. He underwent subtotal colectomy with a sigmoid mucous fistula and ileostomy. He was well postoperatively. This is a first case report in Japan who underwent an operation for UC with COVID-19 infection.

Keywords Ulcerative colitis · COVID-19 · Colectomy

Introduction

Since 2019, the number of COVID-19-infected patients has been increasing in Japan due to the global pandemic. There are still many unclear points about the relationship between ulcerative colitis (UC) and COVID-19. It is anticipated that the number of ulcerative colitis patients infected with COVID-19 will increase in the near future as the number of COVID-19-infected people increases. It seems that some UC cases need an operation and it is important to evaluate the timing of operation and postoperative clinical course. We report a case of refractory UC patient who underwent subtotal colectomy with COVID-19 infection, with a review of the literature.

Case report

Medical history

The patient was 60-year-old male without past medical history. In January 2020, he had more than 20 lines of daily

bloody diarrhea and visited a nearby doctor. He was diagnosed as total colitis-type UC by total colonoscopic examination. His symptoms improved with oral 5-aminosalicylic acid (5-ASA). Coughing appeared on the middle of May and dyspnea appeared on the end of May. He visited a nearby doctor in June and was found abnormal findings on chest X-ray (Fig. 1) and decreased SpO₂, and was transferred to the department of respiratory medicine. The SARS-CoV-2 PCR test was negative and the chest CT scan showed interstitial shadows at the base of the lungs and infiltrative shadows in the upper lobes (Fig. 2). He was treated with antibacterial drugs and oral prednisolone (35 mg/day) for the diagnosis of interstitial pneumonia caused by 5-ASA, and was discharged from the hospital. However, the relapse of UC occurred during the dose reduction of prednisolone (20 mg/day), and azathioprine was started in late June. After self-interruption of the drug, bowel movement with bloody stool was gradually increasing, and he was readmitted to the previous hospital. Colonoscopic examination revealed small ulcers, purulent mucus, and spontaneous bleeding from the descending colon to the rectum with Matts grade 4. High-dose intravenous steroid improved his UC temporarily without remission. During hospitalization, he developed drug-induced pancreatitis (suspicious drugs included azathioprine or levetiracetam, both of which were discontinued) and was treated with continuous infusion and proteolytic enzyme inhibitors. In addition, he developed air embolism probably due to central venous catheter removal by himself,

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Fig. 1 Chest X-ray findings. Infiltration shadows are observed mainly from the upper to middle lobes on both lungs

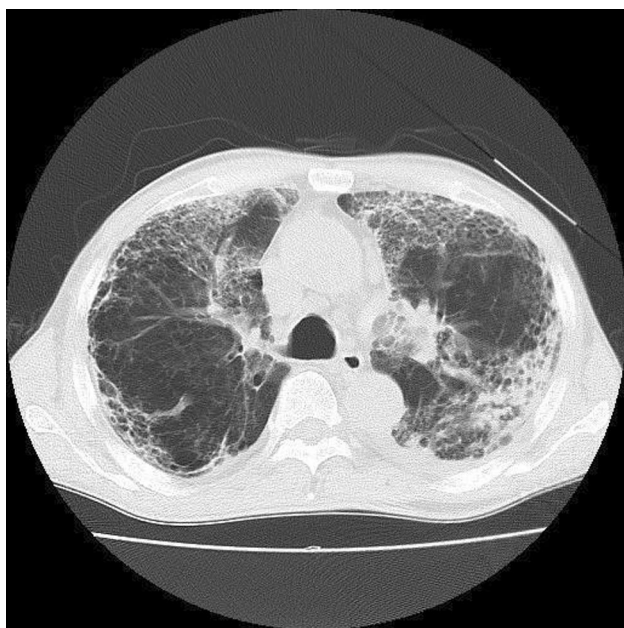


Fig. 2 Chest CT findings. Interstitial opacities at the bases of both lungs and infiltrative opacities predominantly in the upper lobes were observed

and was treated with hyperbaric oxygen therapy and anti-convulsant (levetiracetam). Consciousness level recovered to

normal, but upper limb-dominant weakness remained. The UC worsened in a short period of time from the onset with side effects of multiple drugs and progressing malnutrition (Fig. 3a,b). He was transferred to our hospital for the operation because of medical failure of UC in August.

Present symptoms at admission

The height was 165 cm, the weight was 50 kg (8 kg less than usual). Vital signs; body temperature was 36.6 °C, blood pressure was 110/70 mmHg, pulse rate was 70beats/min,

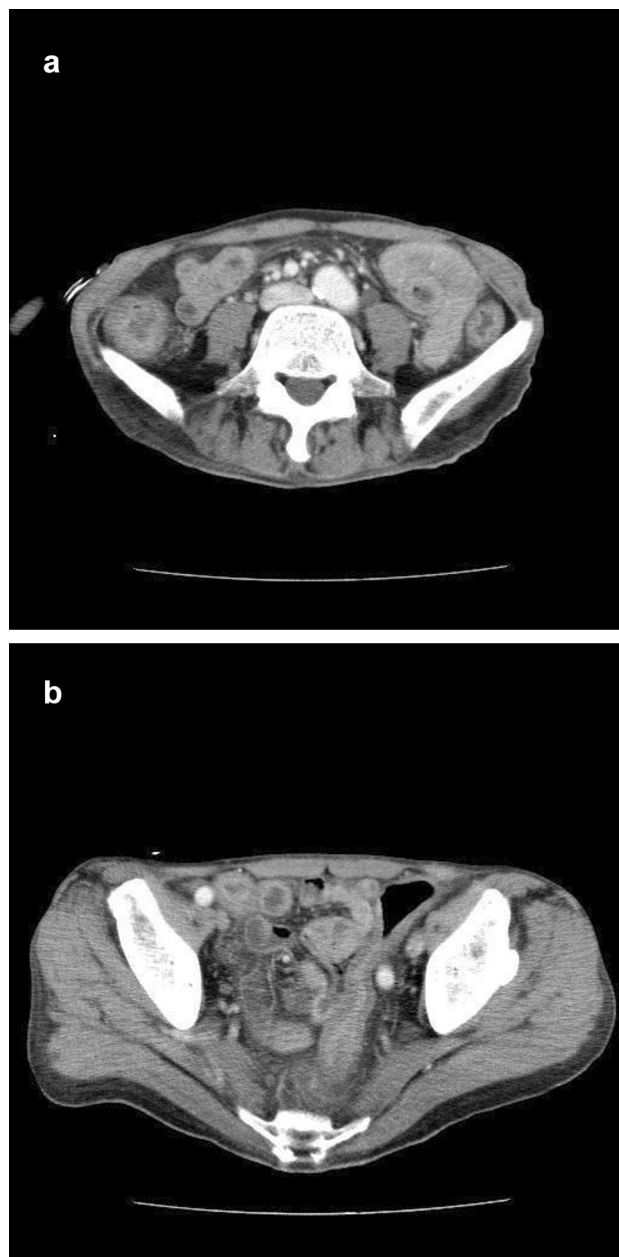


Fig. 3 Abdominal CT findings. From the ascending colon to the rectum, thickening of intestine with contrast effect were observed

SpO₂: 98% (room air). The abdominal findings were soft and flat, without spontaneous pain or tenderness, and the bowel frequency of 6 watery stools / day without melena. He had anemia of Hb 9.3 g/dL and was diagnosed moderate ulcerative colitis (partial Mayo score: 5) (Table.1). Due to the exacerbation of UC and the sequelae of air embolism, he could not walk and be disturbed of hand movement with handshake of right hand and no movement of left hand (performance status (PS): 4). At the time of transfer to our hospital, no taste disorder, olfactory disorder, and respiratory symptoms were observed.

Post-hospital course

The SARS-CoV-2 PCR test performed for screening purposes on the day of transfer in our hospital showed positive, he was found to be infected with COVID-19. He was treated with oral favipiravir, azithromycin infusion, ciclesonide inhalation, and nafamostat infusion in the department of Infectious Disease in our hospital. He was undernourished (albumin 1.7 g/dl), his activity of daily living (ADL) was declined (PS: 4) and he suffered from COVID-19 infection, so his general condition was very poor. Despite of COVID-19 infection, we decided that it would be difficult to continue further medical treatment for UC. We performed an emergency operation on two days after the admission.

Intraoperative findings

The operation was performed in negative pressure operating room. Surgeons, nurses, and anesthesiologists were equipped

Table 1 Blood test findings on admission. Anemia, increased inflammatory response, and marked malnutrition with ALB 1.7 were noted

WBC	7040 /ml	TP	5.7 g/dl
RBC	3.36 millions/ml	ALB	1.7 g/dl
Hb	9.3 g/dl	CRP	4.4 mg/dl
Ht	28.30%	T-BIL	0.3 mg/dl
PLT	328,000 /ml	γ-GTP	217 IU/l
PT%	83%	ALP	580 IU/l
PT-INR	1.11	AST	37 IU/L
APTT-SEC	37.3 s	ALT	65 IU/l
APTT ratio	1.18	AMY	431 U/l
FIB	598 mg/dl	LIPASE	266 U/L
D-dimer	4.60 μg/ml	LDH	161 IU/l
		BUN	13.6 mg/dl
		CRN	0.55 mg/dl
		Na	130 mEq/l
		K	3.9 mEq/l
		Cl	97 mEq/l

In addition, pancreatic enzyme elevation and mild liver dysfunction were observed

with personal protective clothing including an N95 mask (Fig. 4). The anesthesia was a combination of epidural anesthesia (the level of anesthesia was Th10/11) and spinal anesthesia (the level of anesthesia was L3/4) without intubation for his poor respiratory function with pneumonia. Subtotal colectomy with a sigmoid mucous fistula and ileostomy was performed. The skin incision was middle to lower abdominal midline incision. The operation time was 1 h and 36 min and the amount of bleeding was small. Macroscopic findings of the resected specimen showed multiple deep ulcers in whole colon, with diffuse redness and edema (Fig. 5). Histopathological examination revealed crypt abscess, basal plasmacytosis, ulceration and fibrosis extending deep into



Fig. 4 Intraoperative photo. The operation was performed in a negative pressure operating room. Staffs were equipped with infection protective clothing including an N95 mask



Fig. 5 Excised specimen. Deep ulcers with diffuse redness and edema were observed in whole colon

the submucosa. The diagnosis was highly active ulcerative colitis without dysplasia.

Postoperative clinical course

Because of isolation management due to COVID-19 infection, medical staffs were required to wear personal protective equipment all the time. For several days after the operation, he had melena from the residual rectum, which was improved by steroid enema preparation. Diet intake improved according to the recovery of swallowing function without onset of pneumonia, and his general condition improved uneventfully. In addition, urinary tract infection and renal abscess occurred, which was successfully treated with antibacterial drug. The postoperative SARS-CoV-2 PCR test remains positive for a long time (Fig. 6), and he was managed in a private room of infectious disease ward. The test on the 47th day after the operation (11th test after the operation) was negative and the isolation management was released. Although direct intervention by rehabilitation doctors, physical therapists and occupational therapists was impossible during isolation, his ADL gradually improved with the natural course and he became to be able to stand and sit by himself and look after himself (performance status:2). However, he could not replace the stoma orthosis by himself due to poor motor function of the left upper limb and convalescent rehabilitation was required. He was transferred to the previous hospital for rehabilitation on the 52nd day after the operation. We are considering in consultation with the patient and his family whether or not to perform resection of the residual rectum as the second stage surgery, according to the recovery status of quadriplegia and general condition.

Discussion

Since the first case of COVID-19 infection was reported in Wuhan, China in December 2019, the global pandemic of COVID-19 has expanded, and as of December 2020, over 70 million infected cases and over 1.6 million deaths have been reported all over the world [1]. According to the SECURE-IBD database, an international registry of patients with inflammatory bowel disease and COVID-19, the number of patients with ulcerative colitis suffering from COVID-19 is reported to be more than 1500 at December 8, 2020. [2].

There are several reports at present regarding the relationship between inflammatory bowel disease including ulcerative colitis and COVID-19, and many unclear points still exist. Although steroids and various immunosuppressive drugs are considered to increase the risk of various infections in ulcerative colitis [3], it has been reported that there is no difference in the risk of COVID-19 infection between ulcerative colitis patients and the general population [4–6]. There is a report which recommend to perform a screening test for COVID-19 infection in cases with relapse of ulcerative colitis before using immunosuppressive treatment [5, 7, 8]. It was reported that IBD patients with older age, an increase in the number of comorbidities and steroid use were associated with the aggravation of COVID-19 [5, 9].

There are also many unclear points about the effect of COVID-19 infection on the condition of ulcerative colitis. Many reports recommended continued treatment for ulcerative colitis in COVID-19 non-infected patients [5, 6, 10], while it is also reported that reducing or discontinuing

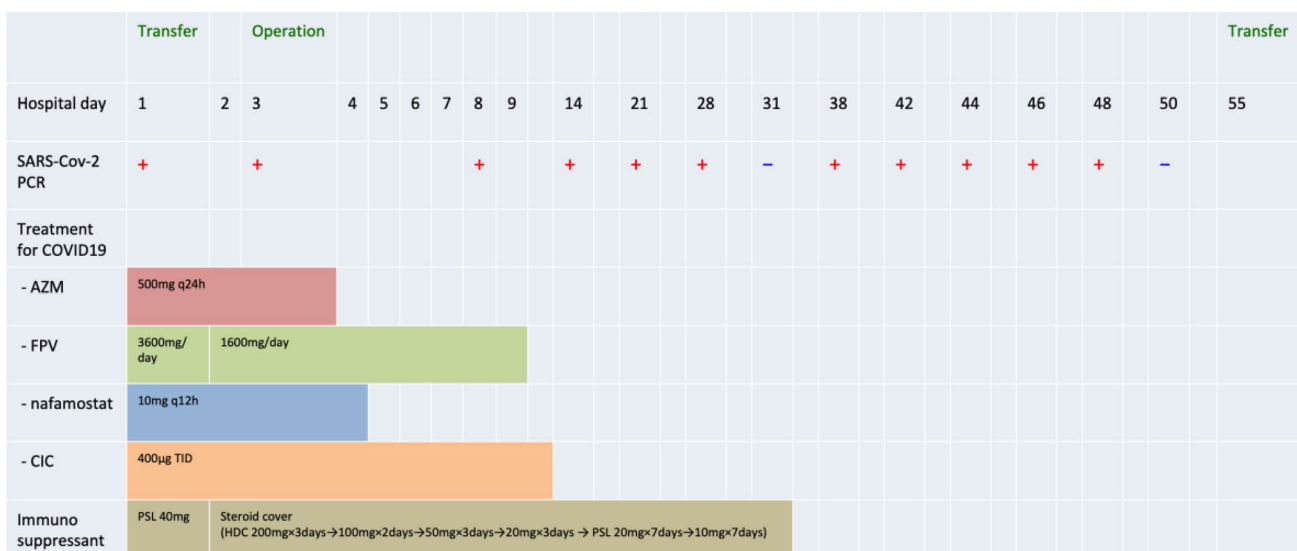


Fig. 6 Clinical course. The postoperative SARS-CoV-2 PCR test of the patient remained positive for 47 days

steroids and immunosuppressive drugs are recommended in COVID-19 infected patients [3, 5, 6] and the worsening of ulcerative colitis may be observed by changing treatment [11]. It is also known that about 10–20% of COVID-19-infected patients have gastrointestinal symptoms such as diarrhea and abdominal pain [12, 13], so it is necessary to take this issue into consideration to treat patients of ulcerative colitis who may have similar symptoms.

There is only one report of surgical cases of ulcerative colitis in COVID-19 infection in PubMed search with "ulcerative colitis" and "COVID-19" as the key words [14]. Our manuscript is the first reported case in Japan.

Surgical indications for UC with COVID-19 infection need to be comprehensively determined by considering the patient's presence of pneumonia, respiratory status, and the condition of ulcerative colitis. The operating time is better to be as short as possible from the viewpoint of preventing COVID-19 infection, and it is necessary to pay attention to surgical mists generated during the surgery [15, 16]. Since the virus is also excreted in feces [17, 18], excised specimen must be taken carefully. It may be critical when infectious complications such as anastomotic leakage and intra-abdominal abscess occur as postoperative complications. We should choose staged operation and perform subtotal colectomy with a sigmoid mucous fistula and ileostomy as first stage. The pouch operation should be performed after recovery of general condition.

In general, it has been reported that the incidence of postoperative respiratory complications and the mortality rate are high with COVID-19 infection during the perioperative period [19], and caution is required especially for male and the elderly aged 70 and over. Postponement of surgery or change to alternative treatment other than surgery is recommended in elective surgery if possible [15, 20–22]. However, in cases of ulcerative colitis who are required for surgery for severe or refractory colitis, the continued medical treatment may worsen the general condition such as malnutrition, progression of anemia and decline in ADL level, which increase the rate of mortality and complications or exacerbation of the COVID-19 infection status. So, careful consideration is required to decide the indications and timing of surgery. After operation, isolation management in a private room is required until a negative SARS-CoV-2 PCR test is confirmed and medical staffs must wear personal protective equipment all the time [23]. We cannot perform postoperative management of the patient as usual.

The postoperative SARS-CoV-2 PCR test of the patient remained positive for a long time. It is reported that genes continue to be detected for a relatively long period of time with decrease to the detection limit even after the symptoms disappear [24]. However, there is still no consensus as to whether the duration of infectivity is the same as the PCR positive period.

In medical care for inflammatory bowel disease (IBD) under the COVID-19 pandemic, it is necessary to carry out necessary, sufficient examinations and treatments with infection protection of patients and medical staff. The relationship between ulcerative colitis and COVID-19 is still unclear and it seems that there are few cases of surgery in particular at this time. In cases which surgical treatment is required for the IBD patients with COVID-19 infection, it is not always possible to treat as usual and the risk of surgery is high. In ulcerative colitis cases who are indicated for surgery, it is necessary to perform surgery at an appropriate timing and comprehensive management such as perioperative management including infection control.

Declarations

Conflict of interest Nao Obara, Kazutaka Koganei, Kenji Tatsumi, Ryo futatsuki, Hirotsuke Kuroki, Eiichi Nakao, and Akira Sugita declare that they have no conflict of interest.

Human rights All procedures followed have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed consent Informed consent was obtained from all patients for being included in the study.

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