

Fulminant necrotising amoebic colitis after corticosteroid therapy for severe COVID-19

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SUMMARY

Acute fulminant necrotising colitis is an uncommon presentation of amoebiasis, which can be precipitated after corticosteroid therapy. Clinicians treating patients with COVID-19 with corticosteroid therapy should be familiar with this condition to avoid delay in diagnosis. The disease is associated with high mortality, and prompt diagnosis and management are essential for salvaging patients. We report successful management of a patient who developed this complication following administration of steroids for COVID-19.

BACKGROUND

Amoebiasis is endemic in many developing countries. About 10% of patients become symptomatic due to amoebic colitis, which is characterised by varying degrees of diarrhoea, dysentery, abdominal pain and tenderness, and rarely, formation of an amoeboma, a tumour-like mass of granulation tissue.^{1 2} Acute fulminant necrotising colitis (AFNC) is found in less than 0.5% cases, but carries a mortality of 50%–100%.³ Corticosteroid therapy has been found to be associated with AFNC.⁴ Herein, we report the successful management of a patient who developed this condition after initiation of systemic steroids for severe COVID-19.

CASE PRESENTATION

A 40-year-old male lawyer from an urban area presented to the emergency with breathlessness for 1 day and fever and malaise for 2 days. History of illness was unremarkable. On examination, his oxygen saturation was 85% on 15 L/min oxygen supplementation via non-rebreathing mask. He tested positive for SARS-CoV-2 and was managed as per the institutional protocol for treatment of COVID-19.

In view of severe COVID-19, he was started on intravenous dexamethasone 6 mg per day. Due to high supplemental oxygen requirement and ongoing lung fibrosis on CT, dexamethasone was continued for 14 days, followed by oral prednisolone 40 mg daily for 5 days. While recovering, on the 20th day of hospitalisation, he developed sudden, severe, diffuse abdominal pain, associated with obstipation and abdominal distension, for which a surgical consultation was sought.

On examination, the patient was afebrile, and had a pulse rate of 122/min, blood pressure of 112/74 mm Hg and respiratory rate of 22/min. On abdominal examination, diffuse tenderness with guarding in the right half of the abdomen was noted.

INVESTIGATIONS

Blood investigations were notable for raised high-sensitivity C reactive protein (99 mg/L), interleukin-6 (116.3 pg/mL) and lactate dehydrogenase (723 U/L). Complete haemogram showed anaemia (haemoglobin 68 g/L) with leucocytosis ($19.7 \times 10^9/L$). Liver function test revealed hypoalbuminaemia (16 mg/L). Kidney function test was normal. Blood gas analysis showed mild metabolic acidosis.

Contrast-enhanced CT of the abdomen revealed pneumoperitoneum and multiple hypoenhancing liver lesions (likely abscesses) in segments IVa and VIII with associated thrombosis in the segmental portal venous branches. Another liver abscess was noted in segment VI. The right-sided colonic wall showed thickening and hypoenhancement with significant surrounding fat stranding ([figure 1](#)). Chest radiograph showed bilateral diffuse infiltrates. The CT severity score for COVID-19 was 20/25 (CORADS-6).

DIFFERENTIAL DIAGNOSIS

The differential included bowel ischaemia due to venous thrombosis in the ileocolic branch of superior mesenteric vein or an infective aetiology.

TREATMENT

Broad-spectrum intravenous antibiotics (piperacillin–tazobactam and metronidazole) were started. Emergency laparotomy was done through a midline incision under general anaesthesia. On exploration, about 0.5 L of dirty peritoneal fluid and a phlegmon in the right subhepatic area were noted. On gentle dissection, the phlegmon revealed two abscesses in the right lobe of the liver and three large perforations in the transverse colon ranging from 5 cm to 8 cm in largest dimension. The necrosed areas of the transverse colon were adherent to the two liver abscesses forming a phlegmon.

Right hemicolectomy was done ([figure 2](#)). The divided ends of terminal ileum and transverse colon were exteriorised in the form of a double barrel stoma. Deroofing of the abscesses in segment IVa of liver was done.

Thorough peritoneal lavage with normal saline was done and pelvic and subhepatic drains were placed. During surgery, the patient required inotropic support and was shifted to the COVID-19 intensive care unit after surgery.

OUTCOME AND FOLLOW-UP

Inotropic support was tapered off gradually and the patient was extubated on the first postoperative



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Figure 1 Contrast-enhanced CT in axial (A,B) and coronal (C) plane showing hypoenhancing thickened ascending colon (white arrow), abutting inferior surface of liver with focal abscess formation (white dashed arrow). Presence of large amount of free air is seen in the peritoneal cavity to suggest pneumoperitoneum (asterisk). Separate liver abscess is seen in the upper part of the right lobe of the liver (black arrow).

day. On the second postoperative day, the patient was shifted to general ward. A pigtail catheter was inserted into the liver abscess in segment VI under ultrasound guidance. The pelvic drain was removed but the subhepatic drain was kept for a week as it was draining pus.

The patient developed surgical site infection, which was initially superficial but later involved the fascia. On the 11th postoperative day, the patient had fascial dehiscence. Mesh laparostomy was done, followed by negative pressure wound therapy (NPWT). The pigtail catheter was removed on the 17th postoperative day. After two sittings of NPWT, each lasting



Figure 2 Specimen of right hemicolectomy showing three large perforations in the ascending colon.

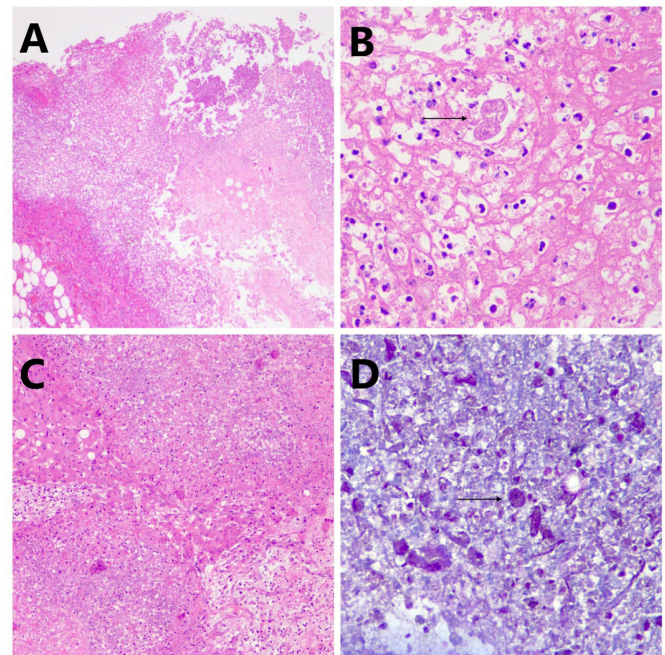


Figure 3 (A) Ulceration and necrosis of ascending colon and dense inflammatory infiltration (40× H&E). (B) Trophozoites of *Entamoeba histolytica* present within the debris (black arrow). They are oval in shape with vacuolated cytoplasm and round nuclei (400× H&E). (C) Liver abscess shows multifocal geographical necrosis and sheets of inflammation. Few preserved hepatocytes are noted (200× H&E). (D) Mason trichrome stain highlights the amoebic trophozoites with the liver abscess (black arrow) (400× H&E).

4 days, fascial closure of the abdomen was done under general anaesthesia.

The histopathology report revealed diffuse ulceration, necrosis and occasional flask-shaped ulcers extending transversely into the submucosa of the colon. Trophozoites of *Entamoeba* were identified, more in the ulcer bed and the luminal aspect, with evidence of erythrophagocytosis. Biopsy from the wall of the liver abscess revealed extensive necrosis and few trophozoites of *E. histolytica* (figure 3).

With this histopathological diagnosis, treatment was modified to oral metronidazole 800 mg three times per day for 10 days, followed by diloxanide furoate 500 mg three times per day for 10 days.² The patient was discharged on postoperative day 32 in stable condition. At 1-month follow-up, the patient was free of any gastrointestinal symptoms. Reversal of ileostomy was planned after 4 weeks.

DISCUSSION

Amoebiasis is common in India, found in about 15% of the population.⁵ This case report describes an uncommon presentation of amoebiasis shortly after corticosteroid therapy in a patient with severe COVID-19. AFNC is a potentially life-threatening emergency. However, early diagnosis and intervention can lead to complete recovery, as seen in this patient.

E. histolytica affects two main organ systems of the human body—the gastrointestinal tract (with a predilection for the caecum and the ascending colon) and the liver.⁶ In this patient, multiple liver abscesses were present, in addition to AFNC. Concomitant liver abscess is found in about 53% of patients with AFNC.⁷

Administration of corticosteroids, even for a brief period, has been reported to precipitate AFNC in previously asymptomatic patients with amoebiasis.⁴ This patient had no comorbidity or no history of any immunosuppression that could lead to sudden AFNC. He was from a good socioeconomic background with access to safe drinking water and had no previous symptoms suggestive of amoebiasis. In the absence of any other predisposing factor, AFNC in this patient may be attributed to COVID-19-related corticosteroid therapy. During the SARS-CoV-2 pandemic, corticosteroids have been used extensively in the treatment of moderate to severe COVID-19.⁸ Physicians treating patients with COVID-19 should be aware of this rare complication of amoebiasis, especially in endemic countries.

AFNC is associated with high mortality and morbidity. In the largest reported series to date, an overall mortality of 89% and 30-day operative mortality of 76% were observed. However, the authors noted that survival rates improved after 1970, which they attributed to newer antibiotics and better intensive care. The authors identified longer duration of symptoms, non-surgical treatment and non-resective procedures as factors correlating with mortality.⁷ Our patient survived despite a history of severe COVID-19 and immunosuppressive therapy. Successful management of this patient could be attributed to early diagnosis and prompt surgical intervention with resection of the involved bowel, stoma creation and early drainage of liver

abscesses. Although the patient had significant wound-related morbidity, all complications were managed appropriately. Young age and absence of comorbidities were also favourable factors in the recovery of the patient.

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Learning points

- ▶ Acute fulminant necrotising colitis is a rare but potentially lethal complication of amoebiasis.
- ▶ Corticosteroid therapy can precipitate this condition in a previously asymptomatic patient.
- ▶ Up to 100% mortality has been reported in the literature.
- ▶ Early diagnosis and prompt surgical management with resection of the involved bowel may be life-saving.
- ▶ Physicians treating patients with COVID-19 with corticosteroid therapy should be aware of this lethal complication, especially in countries where amoebiasis is endemic.

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