Case Report

Colonic Mucormycosis In A Post Covid Patient: A Case Report

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Abstract

Mucormycosis is rare infection caused by fungi of order Mucorales which frequently involves rhino-cerebral or respiratory system with involvement of gastrointestinal (GI) tract being rare.

Classically majority of patients with invasive mucormycosis are immunocompromised and/or have poor glycemic control. This happens especially during recovery phase of COVID-19 when patients are immunocompromised and simultaneously having poor glycemic control. While gastrointestinal (GI) mucormycosis is rare, stomach and colon are most commonly affected organs, and mortality can be as high as 85%.

Diagnosis is difficult since signs and symptoms, imaging and intraoperative gross appearance may not suggest mucormycosis. Diagnosis is usually by histopathologic identification of fungal hyphae in biopsy specimen. A high index of suspicion is therefore necessary in post-COVID-19 patients presenting with mesenteric ischemia or bowel perforation especially if they were immunocompromised. Here we present a case of post COVID disseminated mucormycosis in a 59-year-old diabetic male patient.

Keywords: COVID-19; Gastrointestinal; mucormycosis.

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Case Report

A 59 year old gentleman, known diabetic and hypertensive was transferred for further treatment in January 2022, in view of our hospital being a tertiary care center. He was transferred with a history of Post COVID pneumonia (Covid RT PCR positive), acute kidney injury, and bilateral lung consolidation. He gave history of reinfection with COVID – first infection being in September 2021 followed by symptoms in December 2021. However no documented RT PCR reports were available for the same.

Patient had received Inj. Remdesivir, Inj. Tocilizumab as well as high dose steroids prior to transfer and was shifted to with Foleys catheter, indwelling Haemodialysis catheter in right Internal Jugular Vein and nasogastric tube in situ. On admission, patient was hypoxic with an oxygen saturation (SpO2) of 94% on room air, febrile, tachycardic with a heart rate of 110 beats/min., blood pressure of 160/80 mmHg, respiratory rate of 20/min. Random blood sugar was 153 mg/dl.

On examination, patient was drowsy and confused, following verbal orders and moving all 4 limbs. A systemic examination revealed bilateral coarse crepitations on auscultation of chest and a distended abdomen with diffuse guarding, rigidity and absent bowel sounds. On local examination, blackish discolouration of hard palate was observed.

Lab investigations showed Serum BD Glucan – 154.49 (positive), D dimer (quantitative) – 8955.47 ng/ml and Glycosylated Hb (HbA1C) – 9.1 %.

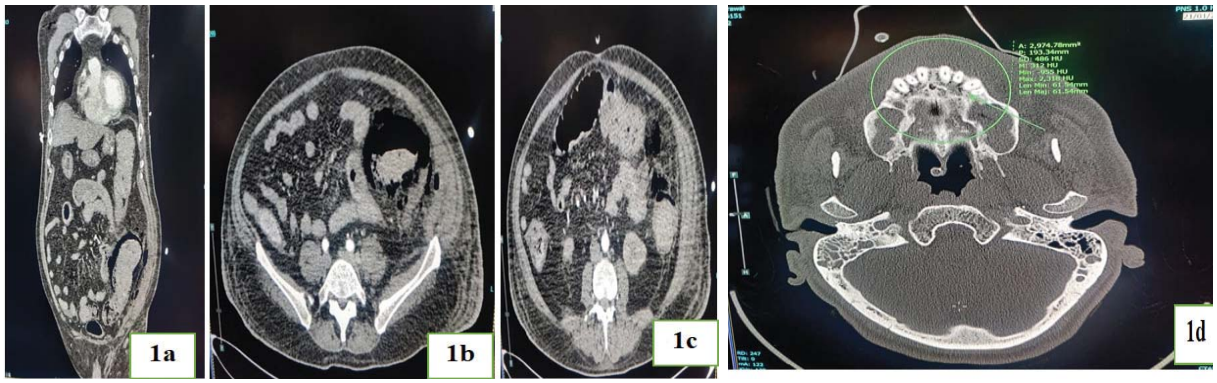


Figure 1a- CT abdomen with features of pneumatosis intestinalis with localized perforation; 1b,1c- Short segment suspicious non - enhancing area in the wall of the adjacent ileal loop, most probably gangrenous bowel; 1d- CT paranasal sinuses showing early invasive fungal disease in the anterior aspect of hard palate/maxillary alveolus

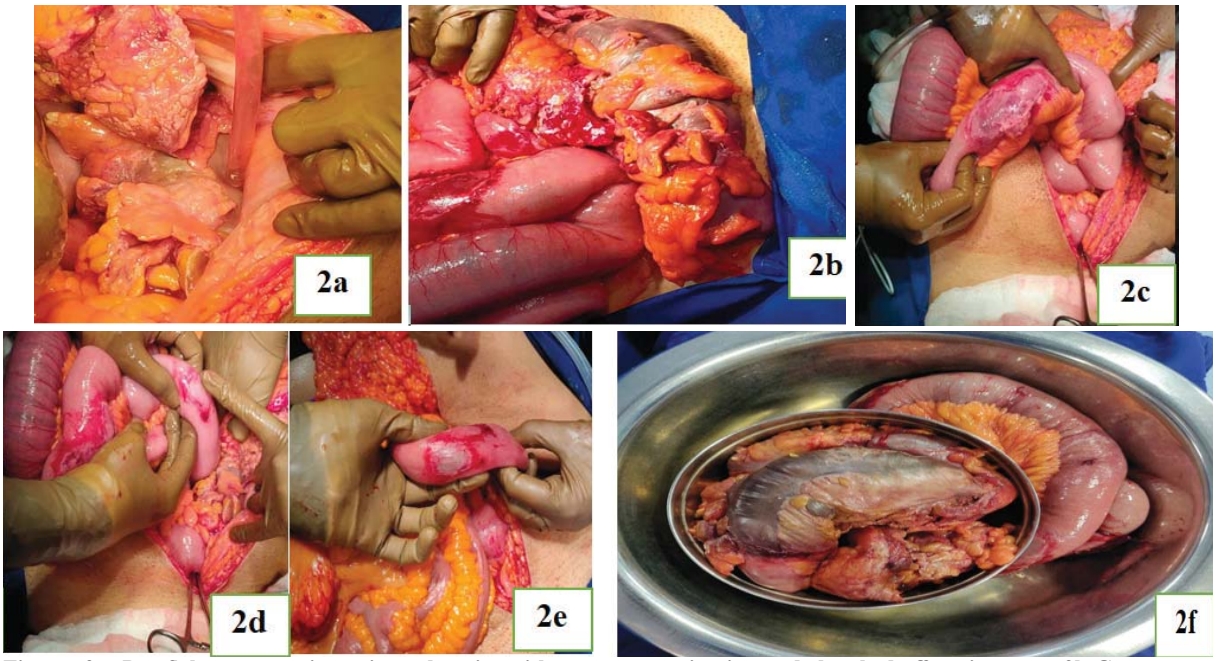
A CT scan of the abdomen was done which showed non enhancing wall of descending colon with intramural air; free air in surrounding mesocolon, extending into the left lateral abdominal wall with associated inflammatory changes. Features were suggestive of pneumatosis intestinalis with localized perforation.

MRI and CT of para nasal sinuses were done which showed moderate patchy paranasal sinus mucosal thickening and opacification, premaxillary antral fat infiltration and anterior hard palate mucosal thinning with pockets of interosseous gas.

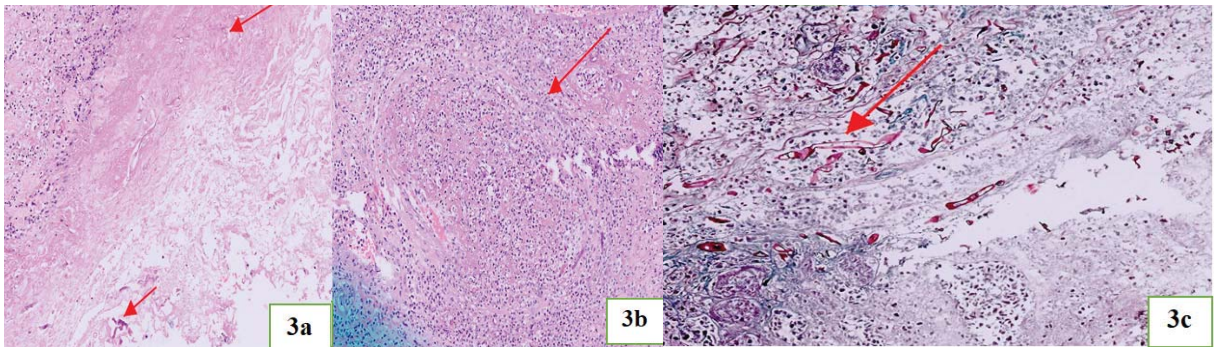
In view of progressively deteriorating GCS and hypotension, patient was intubated in the Intensive Care Unit (ICU) and started on ionotropic supports. Liposomal amphotericin B and Polymyxin B and Tigecycline were started. He underwent Sustained Low Efficiency Dialysis (SLED) for 6 hours and 3 litres of ultrafiltrate was extracted.

In view of the poor clinical status of the patient, decision was taken to proceed with only laparotomy initially and plan for maxillectomy in due course. Exploratory laparotomy done and intra operatively gross peritoneal contamination with sloughed off peritoneum, gangrenous descending and sigmoid colon and multiple patches of necrosis over the small bowel was seen.

A left Hemicolectomy with resection of necrosed small bowel was done. Pus was collected and sent for aerobic culture. Sloughy peritoneum was excised and sent for fungal and anaerobic culture. Ileum, jejunum and transverse colon were removed as end stomas.



Figures 2a- Pus flakes present in peritoneal cavity with gross contamination and sloughed off peritoneum; 2b-Gangrenous descending and sigmoid colon; 2c,2d,2e- Small bowel - multiple patches of necrosis present over jejunum and ileum; 2f- Final Specimen Left Hemicolectomy with resected small bowel



Figures- 3a- Intestinal wall – Ischaemic mucosa covered with slough and fungal hyphae; 3b- Angioinvasion seen; 3c- GMS- Ribbon like aseptate branching hyphae

Post operatively patient was shifted back to ICU and supportive management was continued. Patient was endotracheally intubated, mechanically ventilated (PRVC mode) on Noradrenaline infusion at 0.35 micrograms per kg. per min.

A maxillectomy and tracheostomy was advised in view of the CT/MRI PNS findings. However, the patient's family did not consent for further surgical intervention and took a discharge against medical advice 2 days after surgery. On telephonic follow up with patient relatives, it was found that the patient had succumbed to the disease approximately 10 days after discharge.

Culture reports showed:
Peritoneal tissue fungal culture - KOH mount – Aseptate fungal hyphae, mucor species grown culture (2 days)

Upper palate tissue – KOH mount – Aseptate fungal hyphae, mucor species grown in culture (3 days)

Histopathology report showed ischemic gangrenous colitis and jejunitis secondary to invasive zygomyces resembling mucormycosis.

Discussion

Novel coronavirus disease (COVID-19) was first detected in Wuhan, China, in December 2019 and was declared a pandemic by WHO in march 2020. COVID 19 presents with varied disease patterns, ranging from mild to moderate symptoms to acute respiratory distress syndrome.

Mucormycosis is a rare, potentially fatal fungal infection and generally involves rhino-orbito-cerebral and respiratory tracts. It primarily occurs in immunocompromised hosts with various risk factors.[1] A surge in cases of invasive mucormycosis (IM) was observed after the second wave of novel coronavirus infection in India.

While gastrointestinal (GI) mucormycosis is rare (about 8% of cases), stomach and colon are the most commonly affected organs, and the mortality can be as high as 85%.[2] The prime reason hypothesized for promoting the germination of mucor spores includes relative hypoxia, uncontrolled DM or new-onset hyperglycemia due to steroids, diabetic ketoacidosis leading to an acidic medium, high serum iron levels (glycosylation of ferritin and transferrin), and immunosuppressed state with the poor phagocytic activity of white blood cells and macrophages.[3,4]

Tissue infarction and necrosis subsequent to the invasion of vessels by fungal hyphae is the hallmark of mucormycosis and these infections are rapidly progressive.[3]

Gastrointestinal mucormycosis is relatively rare with only a few cases being reported in literature till date. Disseminated mucormycosis is frequently is post mortem diagnosis in view of its high mortality rate.

Pre-operative diagnosis of gastrointestinal mucormycosis remains a diagnostic challenge. A CT scan may detect indirect signs such as pneumatosis, ischemia, and/or infarction with lack of obvious vascular thrombosis.[5]

Gold standard for diagnosis remains direct visualization of aseptate, branching (right angle or acute) fungal hyphae with giant cell reaction, thrombosis and eosinophilic necrosis of tissue in biopsy or histopathology. Potassium hydroxide (KOH) mount is used for direct microscopic examination and periodic acid-Schiff (PAS) or Grocott-Gomori's methenamine silver (GMS) stains are utilized during histology to assess the fungal morphology.[6]

The treatment of gastrointestinal mucormycosis is an emergency requiring debulking surgery to resect all the infected/necrosed tissue along with antifungal medication and correction of risk factors.[7]

Conclusion

Mucormycosis is an emerging problem in individuals with COVID-19 as well as the healed cases and denotes a poor prognosis. The multisystem involvement and rapid progression associated with the disease warrants additional medical intervention and must be given priority. A multidisciplinary approach is essential for appropriate management of mucormycosis among COVID-19 patients.

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