CASE REPORT

Cytomegalovirus colitis presenting as massive lower gastrointestinal bleeding in an immunocompetent patient

Lee June · Ng Chin · Deyali Chatterjee

Received: 11 June 2006 / Accepted: 28 January 2008

Abstract Cytomegalovirus infection is ubiquitous but often remains asymptomatic in affected patients. Symptomatic cytomegalovirus infection usually occurs in immunocompromised patients—patients who are infected with the Human Immunodeficiency Virus, have received organ transplantations, or are on immunosuppressive therapies. Cytomegalovirus colitis can present with abdominal pain, diarrhea and significant per rectal blood loss. It is a rare entity in immunocompetent patients and can often be missed unless one has a high index of suspicion. We describe a case of CMV colitis in a 78-year-old patient with no known risk factors for immunosuppression who was admitted for respiratory diseases and then subsequently developed transfusion dependent lower gastrointestinal bleeding. She ultimately required surgical resection of her colon. A literature review on CMV colitis, its myriad manifestations and therapeutic outcomes was conducted, with particular emphasis on its occurrence in immunocompetent patients.

Keywords Cytomegalovirus colitis · Gastrointestinal bleeding · Immunocompetent patient · HIV

Introduction

Cytomegalovirus (CMV) is a herpes virus ubiquitous in humans. Primary CMV infection in immunocompetent people is usually asymptomatic, but the virus then enters latency – sequestered in a non-replicative state [1], likely in smooth muscle cells and leukocytes [2].

CMV colitis is a well known entity in immunocompromised subjects – Human Immunodeficiency Virus (HIV) patients [3], transplant recipients [1, 4], and patients receiving immunosuppressive therapy. It rarely affects immunocompetent patients and is often missed. We describe a case of CMV colitis in an immunocompetent patient presenting with lower gastrointestinal bleeding.

Case history

A 78-year-old Chinese lady was admitted for pneumonia. She was treated with intravenous antibiotics for over 4 weeks. She did not previously take any immunosuppressive medications nor did she suffer from any immunodeficiencies.

In the course of her long hospitalization, she developed abdominal pain and diarrhea for 2 weeks. Stool studies were negative for micro-organisms or *Clostridium difficile* toxin. The patient developed fresh bleeding per rectum and her hemoglobin fell from 9.2 g/dL to 7.9 g/dL.

Abdominal examination was normal, and a rectal examination revealed fresh blood. An emergency colonoscopy was performed, showing proctocolitis with a visible spurting vessel at 30 cm (Fig. 1). The patient also had right sided diverticular disease (Fig. 2). Haemoclips were applied to the spurting vessel.

The patient was resuscitated and transfused; her hemoglobin rose to 10.1 g/dL and remained stable for 3 days, when she developed another episode of fresh bleeding

L. June¹ · N. Chin¹ · D. Chatterjee²

¹General Surgery Department

²Pathology Department

Changi General Hospital,
Singapore

L. June (✉)

e-mail: applepuree@yahoo.com

Ph: (+65) 98368002, (+65) 81258479

Fig. 1 Colonoscopy findings
 1. proctocolitis
 2. bleeding vessel

Fig. 2 Colonoscopy findings
 1. caecal polyp
 2. diverticuli

Fig. 3 Colonic mucosa showing dilated congested vessels, extravasation of red blood cells and acute on chronic inflammation. Cytomegalic inclusions in nucleus and cytoplasm are seen in few cells (white arrow). H & E x40

Fig. 4 Positive CMV immunohistochemical staining (white arrow). H & E x20

per rectum. An emergency laparotomy was performed and intra-operative findings were of multiple sigmoid ulcers, diverticular disease of the ascending colon and a caecal polyp. The source of bleeding could not be isolated and the patient underwent a total colectomy with an end-ileostomy.

Histological examination of the resected specimen showed focal areas of mucosal ulceration, with an underlying chronic inflammatory infiltrate. Scattered cytomegalic cells were present, with characteristic ‘owl’s eye’ appearance of intranuclear inclusion surrounded by a clear halo, and smaller granular cytoplasmic inclusions (Fig. 3). The submucosa was oedematous and congested. The muscularis and adventitia showed no significant changes. A single 2.5 cm submucosal lipoma was noted in the colon near the ileo-caecal junction. No evidence of malignancy was seen. Immunostain for CMV was positive in the cytomegalic cells in the colon (Fig. 4).

Post operatively, the patient was stable, her hemoglobin at 9.7 g/dL without further blood transfusions. She recovered well and later went on to receive inpatient rehabilitation.

Discussion

Tropism of Cytomegalovirus

CMV has a propensity to infect proliferating endothelial cells in inflamed, damaged tissue [5]. Colonic mucosal injury and inflammation may also promote migration of CMV-infected macrophages to the colon [6].

Our patient had chronic diarrhea which could have altered the colonic flora, caused colonic mucosal injury and inflammation, thereby causing latently infected macrophages to migrate to the large intestine. The virus then reactivated to cause further mucosal damage.

Clinical Presentation of CMV Colitis

The most common manifestations of CMV colitis in immunocompetent patients are diarrhea, fever, gastrointestinal bleeding and abdominal pain [7–10].

Authors/ Common Symptoms	Karakozis S [8] N=38	Patel SM [10] N=42	Klauber E [7] N=15
diarrhea	82%	88%	86.7%
fever	76%	50%	80%
abdominal pain	53%	19%	60%
Bleeding per rectum	53%,	64%	53.3%

Rarer presentations of CMV colitis include rectal masses suspicious of carcinomas [8, 11].

Our patient presented with 3 of the 4 most common manifestations i.e. abdominal pain, diarrhea, and per rectal bleeding.

CMV Involvement of the Gastrointestinal Tract

CMV can infect any part of the gastrointestinal tract from the mouth to the anus, with the colon being most commonly affected and the small bowel relatively rare [1]. In the colon, CMV appears to preferentially involve the sigmoid colon and rectum [7, 10, 12]

Patel et al studied 42 immunocompetent patients with CMV colitis and identified the sigmoid colon (60%) and the rectum (60%) as most frequently involved. The other sites commonly involved were the descending colon (29%), transverse colon (24%), ascending colon (17%), and caecum (14%) [10].

Lesions are generally limited to a segment of the gastrointestinal tract; simultaneous involvement of multiple

parts is rare [1, 12] Multiple endoscopic biopsies should be performed as the disease is multifocal [3].

Endoscopic Findings of CMV Colitis

Endoscopy findings typically show colitis, ulcers and very rarely pseudopolyps, pseudomembranes [7], and even mass lesions [13, 14].

Ulcers are typically well defined and punched out in appearance [15], but may enlarge and coalesce in the later stage of CMV colitis, producing diffuse redness, erosions, bleeding, and sloughing mucosa throughout the colon [16].

Infection of the vascular endothelial cell leads to enlarged swollen cells, luminal compromise, local vasculitis, and ischemic damage to the colonic mucosa thus supplied, causing ulceration [1, 15, 17].

Histology of CMV colitis specimens has shown CMV inclusion bodies in endothelial cells in our patient and this is consistent with the literature [10].

Treatment Modalities and Outcome

Medical therapy is not always indicated if patients had a preceding colonic insult that is treatable [6]. Otherwise, antiviral therapy is advised for CMV colitis [12].

Complications of CMV colitis include massive hemorrhage, toxic megacolon, 34, 35, 36 perforation, and stenosis, and may necessitate surgical resection [7, 10]. Apart from surgery ($p=0.09$), other factors negatively influencing survival were advanced age, male gender ($p=0.08$), and the presence of immune modulating conditions ($p=0.1$) [18].

Our patient had recalcitrant bleeding which required surgical resection of the involved colon. In spite of her poor prognostic factors – advanced age, altered immune state and having undergone surgery, she improved and was discharged well.

Summary

CMV colitis is an uncommon occurrence in an immunocompetent individual. It can produce profuse lower gastro-intestinal bleeding as in our patient, thereby necessitating surgery. The diagnosis of CMV colitis requires a high degree of suspicion as it can present with non-specific abdominal symptoms. A confirmatory diagnosis involves the use of specific immunohistochemical methods, and therapy has to be specifically targeted at CMV or resolution of the disease may be delayed. We should bear in mind that CMV colitis, no doubt rare, may present as profuse lower GI bleeding and may ultimately require surgery to achieve haemostasis.

References

1. Goodgame RW (1993) Gastrointestinal cytomegalovirus disease. *Ann Int Med* 119:924–35
2. Fish KN, Stenglein SG, Ibanez C, Nelson JA (1995) Cytomegalovirus persistence in macrophages and endothelial cells. *Scand J Infect Dis* 99:34–40
3. Hinnant KL, Rotterdam HZ, Bell ET, Tapper ML (1986) Cytomegalovirus infection of the alimentary tract: a clinicopathological correlation. *Am J Gastroenterol* 81:944–950
4. Rotterdam H, Tsang P (1994) Gastrointestinal disease in the immunocompromised patient. *Hum Pathol* 25:1123
5. Vogel FS (1958) Enhanced susceptibility of proliferating endothelium to salivary gland virus under naturally occurring and experimental conditions. *Am J Pathol* 34:1069–1079
6. Lee CS, Low AH, Ender PT, Bodenheimer HC Jr (2004) Cytomegalovirus colitis in an immunocompetent patient with Amebiasis: case report and review of the literature. *Mt Sinai J Med* 71:347–350
7. Klauber E, Briski LE, Khatib R (1998) Cytomegalovirus colitis in the immunocompetent host: an overview. *Scand J Infect Dis* 30:559–564
8. Karakozis S, Gongora E, Caceres M, Brun E, Cook JW (2001) Life-threatening cytomegalovirus colitis in the immunocompetent patient. Report of a case and review of the literature. *Dis Colon Rectum* 44:1716–1720
9. Sakamoto I, Shirai T, Kamide T, Igarashi M, Koike J, Ito A, et al (2002) Cytomegalovirus enterocolitis in an immunocompetent individual. *J Clin Gastroenterol* 34:243–246
10. Patel SM, Cohen P, Pickering MC, Gazzard BG, Andreyev J (2003) Successful treatment of acute hemorrhagic cytomegalovirus colitis with ganciclovir in an individual without overt immunocompromised. *Eur J Gastroenterol Hepatol* 15: 1055–1060
11. Chow PK, Ho JM, Ling AE, Goh HS (1997) CMV colitis masquerading as colon cancer – an unusual presentation of acquired immunodeficiency syndrome. *Singapore Med J* 38:32–34
12. Dieterich DT, Rahmin M (1991) Cytomegalovirus Colitis in AIDS: presentation in 44 patients and a review of the literature. *J Acquir Immune Defic Syndr* 4:S29–S35
13. Swansiger B, Orchard JL (1996) A colonic mass lesion due to cytomegalovirus in an immunocompromised patient. *J Clin Gastroenterol* 22:41–44
14. Crespo MG, Arnal FM, Gomez M, Monserrat L, Suarez F, Rodriguez JA et al (1998) Cytomegalovirus colitis mimicking a colonic neoplasm or ischemic colitis 4 years after heart transplantation. *Transplantation* 66:1562–1565
15. Iwasaki T (1987) Alimentary tract lesions in cytomegalovirus infection. *Acta Pathol Jpn* 37:549–565
16. Nomura K, Kamitsuji Y, Kono E, Matsumoto Y, Yoshida N, Konishi H et al (2005) Case Report: Severe Cytomegalovirus Enterocolitis after standard chemotherapy for non-Hodgkin's lymphoma. *SCD J Gastroenterol* 40:604–606
17. Keates J, Lagahee S, Crilley P, Haber M, Kowalski T (2001) CMV enteritis causing segmental ischemia and massive intestinal hemorrhage. *Gastrointest Endosc* 53:355–359
18. Galiatsatos P, Shrier I, Lamoureux E, Szilagyi A (2005) Meta-analysis of outcome of cytomegalovirus colitis in immunocompetent hosts. *Dig Dis Sci* 50:609–616