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Case report

Cytomegalovirus pseudotumor of the colon in an HIV patient

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ABSTRACT

Cytomegalovirus (CMV) is the most common cause of severe opportunistic viral disease among patients with acquired immunodeficiency syndrome, and colitis is the most frequent manifestation of CMV infection. Nevertheless, the development of a colonic pseudotumor is a rare benign entity that can be easily misdiagnosed as a colonic neoplasm if the radiologist is not aware of this condition.

We present a case of a 42-year-old male with a CMV pseudotumor of the colon. Imaging findings on computed tomography and magnetic resonance imaging are illustrated. Discussion of the differential diagnoses, based on clinical and imaging findings, is performed in order to propose the right diagnosis, which was histologically confirmed.

Introduction

Cytomegalovirus (CMV) belongs to the virus family *Herpesviridae* and is a ubiquitous virus, which infects almost all humans at some point of their lives. Besides being the most common congenital viral infection, CMV infection is also an important cause of morbidity and mortality in immunocompromised patients, including patients with acquired immunodeficiency syndrome (AIDS), and recipients of solid organ and stem cell transplants [1]. In fact, CMV is the most common cause of severe opportunistic viral disease among patients with AIDS [2]. The most common manifestation of CMV infection of the gastrointestinal tract in immunodeficient patients is colitis [3,4]. However, CMV disease in HIV patients may also manifest as retinitis, esophagitis, peripheral neuropathy, polyradiculoneuritis, pneumonitis, gastritis, and hepatitis [1].

Case report

A 42-year-old male presented to the emergency room with complaints of progressive abdominal pain with 2 weeks of

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evolution, a palpable right paraumbilical mass for 2 months, fever, asthenia, and weight loss of 6 kg in the previous 3 months. He denied changes in the bowel habits or other accompanying symptoms. He had a previous history of human immunodeficiency virus (HIV) infection with poor antiretroviral therapeutic compliance (loss of follow-up in the past 4 years). He also had a history of hepatitis C virus infection previously treated with interferon and ribavirin 10 years before, and a family history of colorectal cancer, that the patient could not clarify. There was no history of recent travels.

On physical examination, a stiff right paraumbilical painful mass was detected, with poorly defined limits. Laboratory tests showed iron-deficiency anemia (Hg 10.5 g/dL), elevated sedimentation rate (80 mm/h), elevated gamma-glutamyltransferase, elevated beta2-microglobulin and broad-based hypergammaglobulinemia. There were no other significant laboratory changes. The last CD4+ count of that month was 175 cells/μL.

The patient underwent a contrast-enhanced abdominopelvic computed tomography (CT), followed by a magnetic resonance imaging (MRI) of the abdomen and pelvis, with the administration of intravenous gadolinium.

Imaging findings

Contrast-enhanced CT (Fig. 1) showed circumferential thickening of the cecum and the ascending colon walls, forming a mass with enhancement on the arterial phase. No bowel obstruction was depicted. This mass encased branches of the ileocolic artery, without obliteration. There was also stranding of the adjacent fat and enlarged regional mesenteric lymph nodes.

MRI was performed seven days later to characterize the findings better (Fig. 2). It confirmed the presence of a noticeable thickening of the cecal wall, with progressive transmural enhancement. Areas of deep mucosal ulceration could also be seen, as well as substantial pericolonic fat stranding, which also showed progressive enhancement. Enlarged regional mesenteric lymph nodes were also depicted. Mural thickening and increased enhancement extended to the terminal ileum, which was not dilated, suggesting that the colonic mass was nonobstructive. The remaining colon was normal.

The combination of the clinical and imaging findings suggested the diagnosis of CMV pseudotumor, which was histologically confirmed after colonoscopy with biopsy. Valganciclovir + ganciclovir was initiated.

In a subsequent MR examination 1 month after the introduction of antiviral therapy (Fig. 3), the mass decreased in size, but there was still wall thickening of the cecum, adjacent fat stranding, as well as mesenteric lymphadenopathies. As a new finding, there was a collection adjacent to the external side of the cecum (6.5 × 4.7 cm), with an air-fluid level and wall enhancement, consistent with an abscess. There was also a small amount of ascites.

Because of the findings still present on MRI despite antiviral therapy, the patient underwent surgery, which confirmed the presence of an abscess, due to superimposed bacterial infection (*Klebsiella pneumoniae, Enterococcus avium*, and *Streptococcus constellatus*), and showed the persistence of a pseudotumor in the cecum. Ileocolectomy, terminal ileostomy and abscess drainage were performed. Histological analysis confirmed the absence of neoplasms and marked inflammatory changes with granulation tissue and fibrosis.

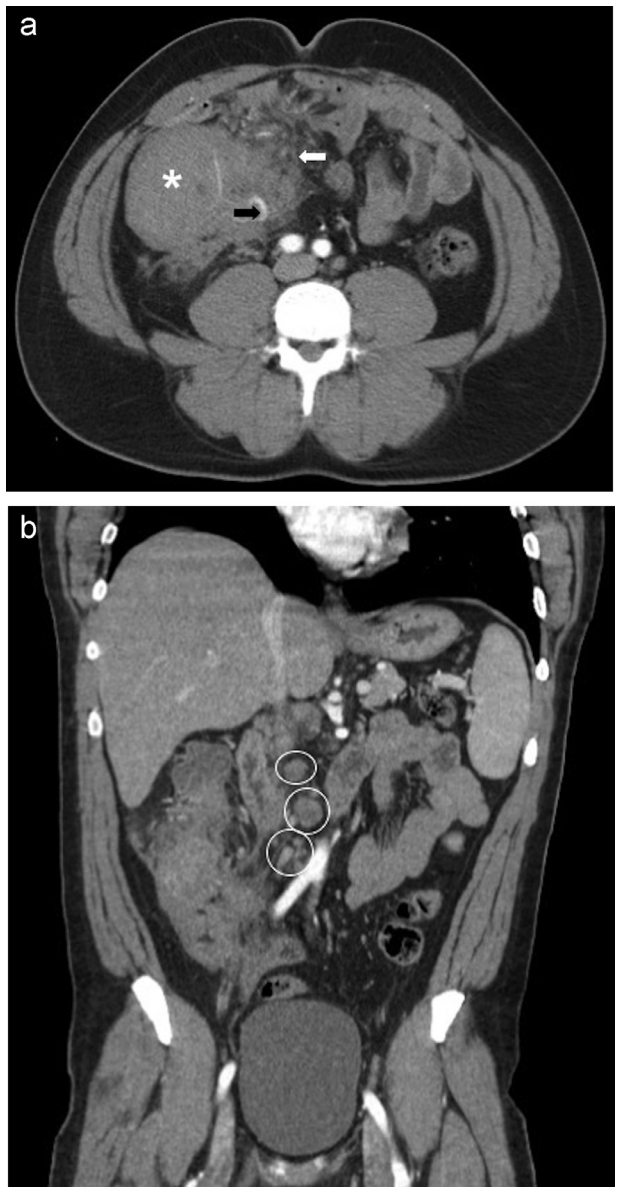

Fig. 1 – Axial CT image (1.25 mm section thickness) after administration of intravenous iodinated contrast media in the late hepatic arterial phase (a), showing marked mural thickening of the cecum, forming a mass (asterisk) that encases branches of the ileocolic artery (black arrow), without obliteration. Note the substantial fat stranding (white arrow). (b) Coronal reconstruction (3 mm section thickness) of the late hepatic arterial phase showing the same aspects and also the presence of regional mesenteric lymphadenopathies—circles.

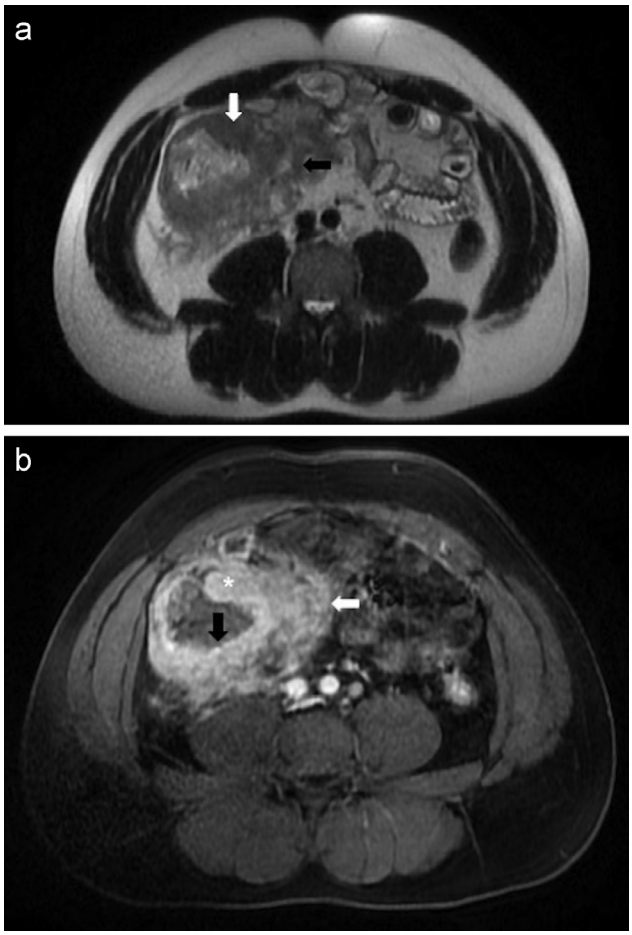

Fig. 2 – Initial MR study. (a) Axial T2-weighted half-Fourier single-shot fast spin-echo (SSFSE) 1.5 T MR image (repetition time ms/echo time ms, 1009/91.2; 6 mm section thickness), showing the thickening of the wall of the cecum (white arrow) and significant stranding of the pericolonic fat (black arrow). (b) Axial fat-suppressed T1-weighted 3D-GRE (gradient echo) 1.5 T MR images (repetition time ms/echo time ms 4.148/1.98; 5.4 mm section thickness) after administration of intravenous contrast material at the arterial phase. Note the thickening of the wall of the cecum (asterisk), with transmural enhancement. There are areas of mucosal irregularity and ulceration (black arrow) and significant stranding of the pericolonic fat (white arrow), which also shows enhancement, due to abundant pericolonic inflammation.

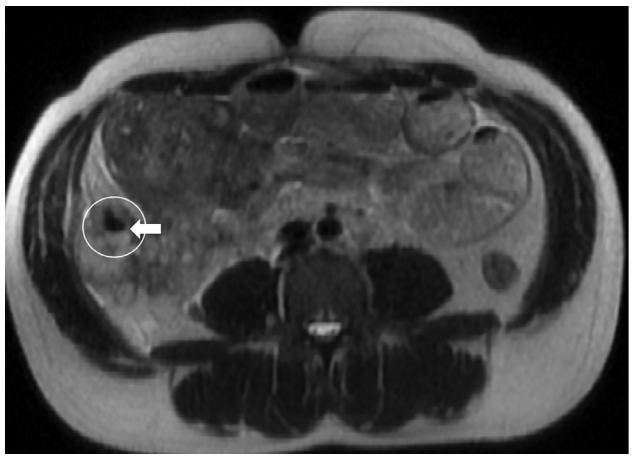

Fig. 3 – MR study 1 month later. Axial T2-weighted half-Fourier single-shot fast spin-echo (SSFSE) 1.5 T MR image (repetition time msec/echo time msec, 1009/91.2; 6 mm section thickness) showing the presence of a collection adjacent to the external side of the cecum (circle), with an air-fluid level (arrow), compatible with an abscess. There was reduction of the parietal thickening of the cecum and of the last ileal loop in comparison with the first MR study.

Discussion

The presence of a soft-tissue mass of the cecum with fat stranding, vessel encasement, and enlarged regional lymph nodes, should suggest malignant neoplasm of the colon as the most probable diagnosis. Patient's family history of colorectal cancer, although not well clarified by him, could favor this hypothesis. However, some features did not support the diagnosis. The large mass caused no significant luminal narrowing and no upstream dilation of the bowel. These findings suggested no proximal obstruction, despite that tumors of the right colon may grow very large before causing significant obstruction [5]. Furthermore, the encasement of branches of the ileocolic artery without obliteration or invasion, and the associated wall thickening of the terminal ileum are not typical of adenocarcinoma of the colon [6]. These features may be found in lymphoma, another aggressive neoplasm that should be considered as a possible diagnosis [7]. Besides, the history of HIV infection and the elevated levels of serum beta2-microglobulin are in keeping with this hypothesis. However, the marked pericolonic fat stranding is not typical of lymphoma, since lymphoma usually shows clear margins with preservation of fat planes [7], and elevated serum levels of beta2-microglobulin are neither sensitive nor specific for the diagnosis of lymphoma. The HIV infection alone may elevate the levels of beta2-microglobulin, and it also correlates with AIDS development [8].

Other less aggressive tumors as gastrointestinal stromal tumors or benign neoplasms, such as lipoma, may also occur without luminal bowel obstruction, even when large. However, they usually show less aggressive imaging features such as smooth margins, exophytic growth, no fat stranding or vessel encasement, and also lymphadenopathies are uncommon [9]. Lipomas show homogeneous fatty attenuation on CT and on MRI they have homogeneous signal intensity identical to that of macroscopic fat, with signal loss on sequences with fat suppression [10].

Hence, the combination of the following findings: the presence of a cecal mass with marked pericolonic fat stranding, the absence of obstructive behavior, encasement of the vessel with no obliteration or invasion, and associated involvement of the terminal ileum, is not typical of any of the most frequent neoplasms of the colon.

In an HIV-positive patient with a mass in the cecum, Kaposi sarcoma should also be considered. Gastrointestinal Kaposi sarcoma is the most common involvement in disseminated disease, and it can manifest as a polypoid submucosal mass or a large lesion with or without central ulceration. However, hyperattenuating lymphadenopathies of the porta hepatis, peripancreatic, retroperitoneal, pelvic, and inguinal are present in most cases, since gastrointestinal involvement occurs in disseminated disease [11]. In this case, there were only mesenteric lymphadenopathies, therefore this diagnosis was also unlikely.

The clinical and imaging findings may be related to inflammatory changes rather than a neoplasm. In this patient with HIV infection, with a CD4+ count of 175 cells/μL and elevated beta2-microglobulin, which points to a risk of evolution to AIDS [8], the following differential diagnoses to be considered are the infectious causes.

As already said, CMV is the most common cause of severe opportunistic viral disease among patients with AIDS [2]. It is more frequent in patients with CD4+ counts of less than 200/μL and in 25% of the cases it provides the basis for the initial clinical diagnosis of AIDS [3]. The most common manifestation of CMV infection of the gastrointestinal tract in immunodeficient patients is colitis [3,4], which is predominantly diffuse [3], although it may only affect only the right colon/ileocecal valve or rectosigmoid colon [2,3]. On CT and MRI, CMV colitis usually presents with the typical manifestations of infectious colitis [12], including colon wall thickening with target sign (due to mural edema), pericolonic fat stranding, free fluid effusion, and lymphadenopathy [2,12]. Besides these findings, CMV colitis may also present diffuse mucosal ulceration and mimic ulcerative colitis, or aphthous ulcerations with skip areas, mimicking Crohn colitis [2,4].

Although the described findings of colitis are the most common manifestation of CMV gastrointestinal infection, it can also be associated with CMV-induced pseudotumor or mass-like lesion in the colon [3]. This manifestation is much more common in immunocompromised patients, particularly HIV positive patients [3,12].

Patients with CMV-induced pseudotumor usually present with abdominal pain and a nonobstructing mass, sometimes associated with other less frequent signs and symptoms, which include weight loss and a palpable mass [3,12]. These were the signs and symptoms that prompted the visit of this patient to the emergency room. The pseudotumor can develop in various gastrointestinal locations, although there is a described affinity for ileum and right colon [12], as in this case. Histologically, the thickening of the bowel wall is caused by submucosal edema, granulation tissue, inflammation, and fibrosis [3,12]. In this case, the thickened colon wall showed progressive transmural enhancement, and there was also progressive enhancement of the adjacent stranded fat, which is consistent with the presence of pericolonic inflammation. In fact, thickened bowel wall and inflammatory infiltration are the most typical CT and MRI findings of this entity. Other features that are common include mucosal irregularity and ulceration [12], which were also present in this case.

Another infectious disease that must be included in the differential diagnoses list is tuberculosis infection since it usually involves the ileocecal valve region [13]. This condition often manifests as an asymmetric thickening of the colon and terminal ileum wall with important pericolonic fat stranding, since there is a desmoplastic reaction and a large amount of fibrotic tissue [4,12]. This inflammatory reaction may also produce a mass like lesion (tuberculoma) and mimic the appearance of a neoplasm [12], as in our case. Although it also presents with enlarged lymph nodes, these usually show central hypoattenuating areas and peripheral rim of enhancement, as well as calcifications [12], which was not the case.

Amebiasis, like tuberculosis, has a predisposition for involving the distal ileum and cecum [13]. It can lead to colitis, abscess formation and in some cases to the development of a tumor-like mass, which is called ameboma [14,15], which could explain the cecal mass visualized in this case. However, it is commonly acquired by ingesting contaminated food or water and is endemic in developing countries [14]. The patient had no history of recent travels to endemic areas, so this diagnosis is also unlikely.

As already said, the combination of the clinical and imaging findings pointed to the diagnosis of CMV pseudotumor, which was histologically confirmed.

Among the most recent CMV pseudotumor cases published in the literature, some of them also occurred in the cecum [16–19]. One developed in a renal transplant recipient [16] and the other three in immunocompetent patients, one of them with a Left Ventribular Assist Device [17]. Although the imaging appearance of CMV pseudotumor on CT was previously documented in some of these cases [17–19], its appearance on MR was not published.

The patient of our case underwent surgery, which showed the persistence of a pseudotumor in the cecum, even after antiviral therapy. Some previously described cases showed similar behavior, without complete resolution of the CMV pseudotumor with medical treatment [17,19].

Conclusion

In conclusion, we presented a case of CMV pseudotumor of the colon in an HIV patient, which is a rare benign entity that can be easily misdiagnosed as a colon neoplasm if the radiologist is not aware of this condition.

In this case, although the patient has undergone antiviral therapy, there was persistence of the pseudotumor and the patient was submitted to ileocolectomy with terminal ileostomy. He was discharged from the hospital 15 days after surgery, under antibiotic treatment, asymptomatic. He will be followed on an outpatient basis by Surgery and Infectiology.

Conflict of Interest

None.

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