


# A Case Of *Entamoeba Histolytica* Infection Among Men Who Have Sex With Men

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## Abstract

*Entamoeba histolytica* is a parasite responsible for intestinal amebiasis and possible extraintestinal manifestations, such as liver abscesses. India, Africa, Mexico, and Central and South America have some of the highest rates of infection due to poor socioeconomic and environmental conditions. The infection has become more common in the United States due to an increase in emigration. There has been a rising incidence of sexual transmission of the infection, most commonly seen in men who have sex with men. Here, we present a case of a symptomatic extraintestinal *E histolytica* infection in a young Hispanic bisexual man.

## Keywords

liver abscess, parasite, *Entamoeba histolytica*

## Introduction

*Entamoeba histolytica* is a parasitic protozoan that is responsible for intestinal amebiasis and extraintestinal manifestations including liver abscesses. It is endemic in both tropical and subtropical geographies, mostly presenting as an asymptomatic infection but killing an estimated 40 000 to 110 000 patients per year.<sup>1</sup>

Amoebic dysentery occurs when the infective cysts of *E histolytica* are consumed from fecally contaminated water and food sources, along with a rising incidence of sexual transmission, most commonly seen in men who have sex with men (MSM).<sup>2</sup> *E histolytica* is highly transmissible between MSM due to the increased prevalence of oro-anal contact in the community. This contact increases transmission by introducing infective cysts, in combination with a low infectious dose of 1 cyst required in some cases.<sup>3</sup> The infective cyst once consumed travels from the stomach into the large intestine, eventually releasing its mobile and pathogenic trophozoite form. The trophozoite has a strong affinity for colonic mucin cells and possesses enzymes capable of destroying the epithelial cells, allowing penetration and creation of the characteristic intestinal flask-shaped ulcers.<sup>4</sup> Once the mucosa is inflamed, patients may present with abdominal pain, weight loss, and watery or

bloody diarrhea. When the trophozoites infiltrate the colonic mucosa, they can enter portal circulation or directly into the peritoneum.

Once in portal circulation, the risk for liver abscesses is significantly increased and is the most common extraintestinal manifestation of intestinal amebiasis. Fever and right upper quadrant pain are seen with liver infiltration and abscess formation. Elevated white blood cell (WBC) count may be seen, and diagnosis is done by microscopic stool examination or serum antibody test to *E histolytica*.<sup>5</sup> Liver abscess can be seen on computed tomography (CT), mostly in the right hepatic lobe. If the abscess has a risk of rupture (size greater than 5 cm), it may require therapeutic aspiration.<sup>6</sup> Here, we present a case of symptomatic, extraintestinal *E histolytica* infection in a young Hispanic bisexual male, found to have a liver abscess on abdominal imaging.

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## Case Report

A 25-year-old bisexual, Hispanic man who emigrated from Honduras in April 2021 with no medical history presented to the emergency department complaining of a 2-week history of fluctuating, sharp, and worsening right upper quadrant pain with a 1-week history of fever and chills. He described a 2-day history of diarrhea and abdominal bloating approximately 3 days prior to presentation but denied hematochezia, nausea, vomiting, chest pain, and shortness of breath. He was hemodynamically stable and febrile with a temperature of 102.2 F (39°C). On admission, he endorsed being sexually active with both male and female partners. Initial labs were remarkable for leukocytosis (WBC, 18.86K/mm<sup>3</sup>), normocytic anemia (hemoglobin, 12.1 g/dL; mean corpuscular volume, 82.1 fL), elevated alkaline phosphatase (227 U/L), and hypoalbuminemia (2.6 g/dL). Initial physical examination was positive for tenderness to deep palpation in the right upper quadrant with guarding; however, the abdomen was soft. An abdominal and pelvic CT with intravenous and enteric contrast done on admission revealed a multiloculated complex fluid collection measuring 9.2 × 7 × 2.88 cm in the posterior right lobe of the liver, as seen in Figure 1A. The surrounding liver parenchyma was hypodense suggesting edema, and trace fluid was seen around the inferior tip of the right lobe of the liver in addition to a small right pleural effusion. Interventional Radiology was consulted, and on day 2 of admission, a 8.5 × 25 cm French mermaid M-drain single-step drainage catheter was placed under ultrasound guidance. In total, 117 mL of purulent, sanguineous fluid was collected and sent for laboratory analysis. Reverse transcription polymerase chain reaction (RT-PCR) testing positively identified *E histolytica* DNA in the fluid drained from the abscess. Serum was positive for IgG antibodies to *E histolytica* and negative for antibodies to *Echinococcus*. Stool RT-PCR was negative for *E histolytica* DNA on a sample collected on the final day of hospitalization. Stool ova and parasite analysis was negative in 3 separate samples. He was maintained on a regimen of intravenous fluids, intravenous metronidazole 500 mg every 8 hours, and intravenous ceftriaxone 2 g per day throughout hospitalization. An average of 10 mL per day of sanguineous fluid continued to drain from the catheter until day 9 of hospitalization at which point the pigtail catheter was removed. A repeat abdominal CT scan with enteric and intravenous contrast performed the day prior to drain removal revealed a decrease in size of liver abscess to 6.1 × 4.5 × 3.4 cm with continued surrounding liver parenchyma hypodensity and reduced quantity of perihepatic fluid as seen in Figure 1B. He was now afebrile and had experienced resolution of his right upper quadrant pain and diarrhea. He was discharged 10 days after initial presentation with instruction to take oral metronidazole 750 mg every 8 hours for 10 days and to follow up with primary care and infectious disease.



**Figure 1.** (A) Initial computed tomography of the abdomen showing a complex fluid collection measuring 9.2 × 7 × 2.88 cm in the posterior right lobe of the liver. (B) Repeat computed tomography of the abdomen revealing a decrease in the size of the liver abscess to 6.1 × 4.5 × 3.4 cm with continued surrounding liver parenchyma hypodensity and reduced quantity of perihepatic fluid.

## Discussion

*E histolytica* is a parasitic protozoan that is responsible for amebiasis in humans. Areas with some of the highest rates of infection with *E histolytica* include India, Africa, Mexico, and Central and South America due to poor socioeconomic and environmental conditions.<sup>7</sup> With only a 4% prevalence, infection has become more common in the United States due to an increase in emigration.<sup>8</sup> Annually, amebiasis affects more than 50 million individuals and results in over 100 000 deaths. From 1990 to 2007, 134 amebiasis-related deaths were identified, with 40% of those cases occurring in Texas and California.<sup>8</sup> While most cases are asymptomatic, 10% of cases are associated with significant morbidity and mortality, especially when left untreated.<sup>9</sup> Similar to our case, symptomatic amebiasis often results in abdominal pain, and watery or bloody diarrhea. Furthermore, the amoeba could spread beyond the intestinal tract and disseminate to the liver, brain, and lungs causing liver abscess, cerebral amebiasis, and pneumonia, with fulminant hepatitis being the most life-threatening complications with a high morbidity and mortality.<sup>10</sup> As discussed above, an infection with *E histolytica* begins with ingestion of mature cysts in fecally contaminated food, water, hands, or even through exposure to fecal matter during sexual contact. Once the cysts are ingested, the

resulting trophozoites can multiply by binary fission in the large intestine to produce cysts which can be fecally eliminated to continue their life cycle through a new host. In asymptomatic patients, trophozoites are confined to the wall of the intestine only to be passed in the stool, but in symptomatic patients, the resulting trophozoites often invade the intestinal mucosa to cause extraintestinal disease with liver abscess being the most common manifestation.<sup>11</sup> Risk factors for amoebic liver abscesses include male sex, alcohol consumption, and poor hygiene.<sup>12</sup>

There are several methods that could be used for detecting amebiasis, and often a combination of tests are necessary to establish a diagnosis; these include stool microscopy, stool antigen testing, stool PCR, and serology. Although the most widely available test is stool microscopy, this has the lowest sensitivity (<60%) and should be avoided when other diagnostic tests are available. Stool PCR, stool antigen testing, and serology have higher sensitivities and specificities, but each has its downfall; stool PCR is the gold standard test, but the limitation is its cost, and this is an issue in endemic areas where amoeba is most common. Though the simplest to perform, stool antigen testing has a low sensitivity for amebic liver abscess. Finally, serology remains positive for years after resolution of the infection, so this test is less helpful in endemic areas.<sup>13</sup> In our case, RT-PCR performed on the abscess fluid positively identified *E histolytica* DNA, and his serum was also positive for IgG antibodies to *E histolytica*. However, the stool RT-PCR was negative for *E histolytica* DNA. Of note, this sample was from the final day of hospitalization and after a 10-day course of metronidazole was completed, which could have led to a false negative.

In more developed countries where ingestion of contaminated food or water supplies is less common, studies have reported an increased incidence of amebiasis in MSM in the form of oral-anal sex. A 1981 study based in a New York City sexually transmitted disease clinic found that out of 163 men, 22% of homosexual men had *E histolytica* detected on stool microscopy compared with 6% and 0% of bisexual men and heterosexual men, respectively.<sup>14</sup> This is important to note as in our case our patient informed us that he engages in sexual activity with men. In MSM who are HIV-infected, the infection rates are even more pronounced—in a 2005 study of 634 HIV-infected individuals (61% MSM), 429 HIV-uninfected individuals with gastrointestinal symptoms, and 178 healthy controls, results showed that 5% of MSM with HIV were found to be seropositive for *E histolytica*, whereas 2% of HIV-infected non-MSM and 2% of HIV-uninfected individuals with gastrointestinal symptoms were found to be positive, with 0% of healthy controls being seropositive.<sup>15</sup> Compared with these results, our case demonstrates an HIV-uninfected man who engages in sex with men who was seropositive for *E histolytica*. The study of this patient brings to light the question of whether he was infected in his home country of Honduras prior to emigrating or during his time in

the United States, and if the former is true, what caused the asymptomatic infection to turn symptomatic. Of those patients who develop a liver abscess, 80% develop symptoms that include fever, right upper quadrant pain, and cough within 2 to 4 weeks of exposure, but studies have also shown that the symptomatic stage may not develop until 8 to 20 weeks after exposure.<sup>6,16</sup> As our patient emigrated to the United States 6 months ago, these statistics do not provide a concrete answer and may warrant further research.

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### Ethical Approval

Our institution does not require ethical approval for reporting individual cases or case series.

### Informed Consent

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

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