

## LETTER TO THE EDITOR

# Rapid Detection of *Entamoeba histolytica* Using FilmArray Gastrointestinal Panel: Enhancing Early Treatment and Outcomes

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### SUMMARY

**Background:** *Entamoeba histolytica*, a protozoan parasite, is responsible for intestinal amebiasis and can cause severe complications. It is prevalent in tropical and subtropical regions and is a significant health concern in developing countries. Traditional diagnostic methods often delay the diagnosis, leading to prolonged patient suffering and increased risk of complications.

**Methods:** We report the case of a 59-year-old HIV-positive man on Odefsey, who presented with a week-long history of abdominal pain and diarrhea. Initial stool analysis suggested bacterial colitis, and empirical treatment with levofloxacin was initiated. However, the patient's condition worsened, resulting in hospitalization. Laboratory findings included elevated white blood cell count and high-sensitivity C-reactive protein, with low plasma sodium and potassium levels. Stool bacterial cultures were negative for common pathogens.

**Results:** Rapid diagnosis was achieved using the FilmArray GI Panel, which detected *E. histolytica* within an hour. Subsequent stool microscopy suggested the presence of *E. histolytica*/*E. dispar* cysts. Prompt anti-amoebic therapy with metronidazole and paromomycin resulted in significant clinical improvement. The case was reported to the Centers for Disease Control (CDC) as a Category II notifiable disease.

**Conclusions:** This case underscores the critical role of the FilmArray GI Panel in the rapid detection of *E. histolytica*, facilitating timely and effective treatment. Early diagnosis using advanced molecular diagnostics significantly improves patient outcomes and should be incorporated into routine clinical practice for managing gastrointestinal infections.

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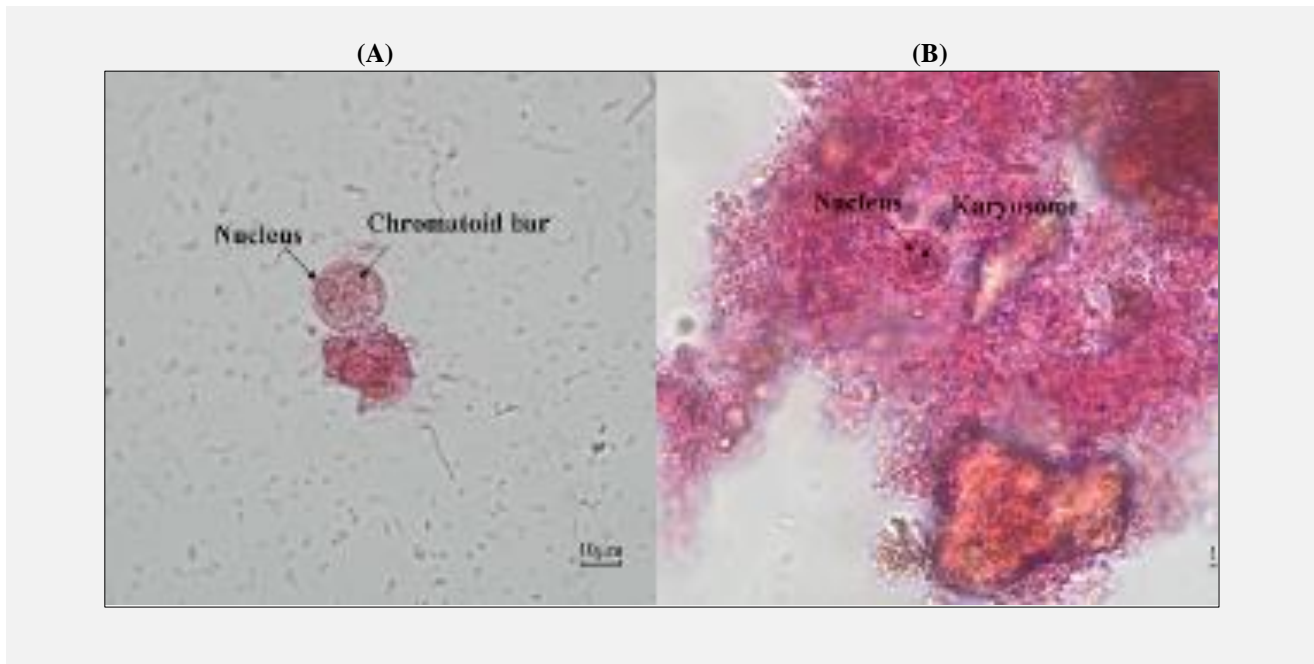
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### KEYWORDS

parasitic infection, *Entamoeba histolytica*, FilmArray GI Panel, fecal microscopy, gastrointestinal infections

### LETTER TO THE EDITOR

*Entamoeba histolytica* is a protozoan parasite responsible for intestinal amebiasis and can also lead to complications outside the intestines, such as liver abscesses. It is predominantly found in tropical and subtropical regions and typically presents asymptotically, causing mild to severe symptoms, such as abdominal pain, diarrhea, or bloody diarrhea. However, it contributes significantly to illness and death in developing nations [1,2].



**Figure 1A, 1B.** Bright-field microscopy images of stool samples stained with modified iron-hematoxylin (MIF) at 400 x magnification, shows cells of *E. histolytica* and *E. dispar*, A and B, respectively.

(A) The arrow points to the distinctive nucleus and chromatoid bar. (B) The arrow points to the distinctive nucleus and karyosome.

Amoebic infection occurs when *E. histolytica* cysts are consumed from contaminated food and water. It can also spread through sexual contact, especially among men who have sex with men (MSM) [3]. Huang SH and colleagues reported a rising incidence of invasive amoebiasis among newly diagnosed HIV patients in Taiwan. Therefore, routine screening for *E. histolytica* infection for early diagnosis and treatment is recommended [4]. Traditional diagnostic methods, such as stool routine examination, often lead to delayed diagnosis, resulting in prolonged patient suffering and an increased risk of complications. Additionally, these methods cannot differentiate between the cysts and trophozoites of the pathogenic species *E. histolytica* and the non-pathogenic species *E. dispar* [5]. In this case report, we highlight the crucial role of the FilmArray Gastrointestinal (GI) Panel in the rapid detection of *E. histolytica*, facilitating timely intervention and improving patient outcomes.

A 59-year-old man who takes Odefsey (1# QD) for HIV and has regular follow-ups at the medical center had been experiencing abdominal pain and diarrhea for one week. He visited the gastrointestinal outpatient department, where stool analysis revealed 10 - 20 RBCs and 10 - 20 WBCs. Under the initial diagnosis of bacterial colitis, he was empirically administered oral levofloxacin (750 mg QD) for three days. Instead of improving, his symptoms worsened, and he developed a fever. He subsequently visited the emergency department and was

admitted. Laboratory results showed a hemoglobin level of 16 g/dL, an RBC count of  $4.96 \times 10^6/\mu\text{L}$ , a WBC count of  $27.7 \times 10^3/\mu\text{L}$ , and a platelet count of  $292 \times 10^3/\mu\text{L}$ . Plasma levels of sodium and potassium were below the normal range, and high-sensitivity C-reactive protein was over 16 mg/dL. Stool bacterial culture tests were negative for *Salmonella*, *Shigella*, *Campylobacter*, and *Vibrio* spp.

To speed up the diagnosis, a stool sample was tested using the FilmArray GI Panel, a multiplex PCR assay that detects multiple gastrointestinal pathogens. Within an hour, the FilmArray GI Panel returned a positive result for *E. histolytica*. Fresh stool samples were also collected in sterile containers and sent immediately to our laboratory. Bright-field microscopy with Merthiolate Iodine Formaldehyde (MIF) staining indicated suspected cells of *E. histolytica* and *E. dispar* (Figure 1A, 1B, respectively). The next morning, the case was reported to the Centers for Disease Control (CDC) as a Category II notifiable disease under the final diagnosis of amoebic colitis. Oral metronidazole (750 mg TID) and paromomycin (750 mg TID) were administered in the following days, and the patient showed significant improvement in symptoms, including fever, abdominal pain, and diarrhea.

This case underscores the importance of early and accurate diagnosis in the management of amoebiasis. The FilmArray GI Panel's ability to detect *E. histolytica* rapidly, before routine stool examination results are avail-

able, represents a significant advancement in clinical practice. Traditional methods, including microscopic examination and antigen detection, are often time-consuming and less sensitive, leading to delays in diagnosis and treatment. Early detection through the FilmArray GI Panel accelerates the initiation of targeted therapy, mitigates the risk of severe complications, and improves patient prognosis. Our previous study recommended the incorporation of this method into clinical practice to expedite the diagnosis and management of gastrointestinal infections, ultimately enhancing patient care and health-care efficiency [6].

This case underscores the importance of early and accurate diagnosis in the management of amoebiasis. The FilmArray GI Panel's ability to detect *E. histolytica* rapidly, before routine stool examination results are available, represents a significant advancement in clinical practice.

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#### **Declaration of Interest:**

There are no conflicts of interest associated with this paper.

#### **References:**

1. Zibaei M, Firoozeh F, Azargoon A. Infantile amoebiasis: a case report. *Case Rep Infect Dis* 2012;2012:614398. (PMID: 22779016)
2. Fu B, Wang J, Fu X. A rare case of extraintestinal amebiasis. *BMC Infect Dis* 2022;22(1):364. (PMID: 35410146)
3. Escola-Verge L, Arando M, Vall M, et al. Outbreak of intestinal amoebiasis among men who have sex with men, Barcelona (Spain), October 2016 to January 2017. *Euro Surveill* 2017;22(30):30581. (PMID: 28797327)
4. Huang SH, Tsai MS, Lee CY, et al. Ongoing transmission of *Entamoeba histolytica* among newly diagnosed people living with HIV in Taiwan 2009 - 2018. *PLoS Negl Trop Dis* 2020;14(6):e0008400. (PMID: 32530918)
5. Hamzah Z, Petmitr S, Mungthin M, Leelayoova S, Chavalits-hewinkoon-Petmitr P. Differential detection of *Entamoeba histolytica*, *Entamoeba dispar*, and *Entamoeba moshkovskii* by a single-round PCR assay. *J Clin Microbiol* 2006;44(9):3196-200. (PMID: 16954247)
6. Chen YJ, Chen SY, Er TK. Assessment of the clinical utility of the FilmArray<sup>TM</sup> Gastrointestinal Panel for detecting gastrointestinal pathogens. *Clin Lab* 2024;70(6). (PMID: 38868872)