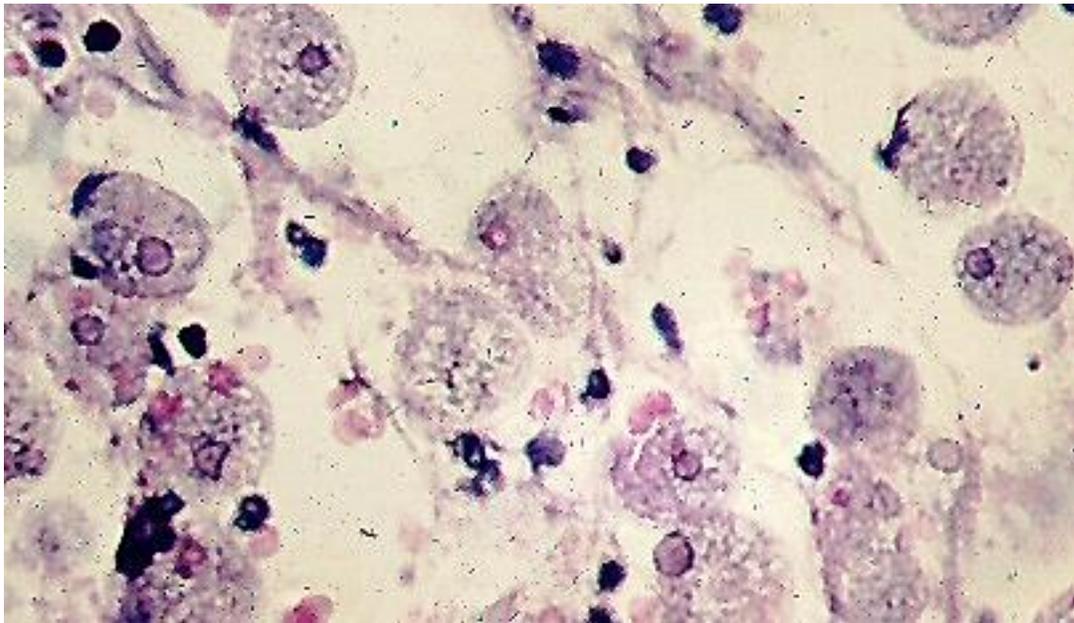
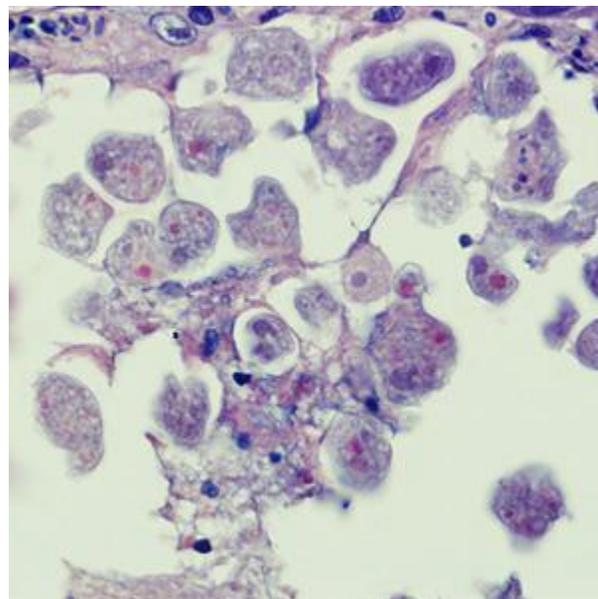


## PARASITOLOGY CASE HISTORY 15 (HISTOLOGY) (Lynne S. Garcia)

A biopsy was performed on a 27-year-old man with no known travel history, presenting with a perianal ulcer. The specimen was preserved in formalin and sent to a pathology lab for work-up. The images below demonstrate what was observed at 1000x magnification from a section of the tissue, stained with hematoxylin and eosin (H&E). What is your diagnosis? Based on what criteria? What other diagnostic tests might be recommended?



H&E



H&E

## ***Scroll Down for Answer and Discussion***

### **Answer and Discussion of Histology Quiz #15**

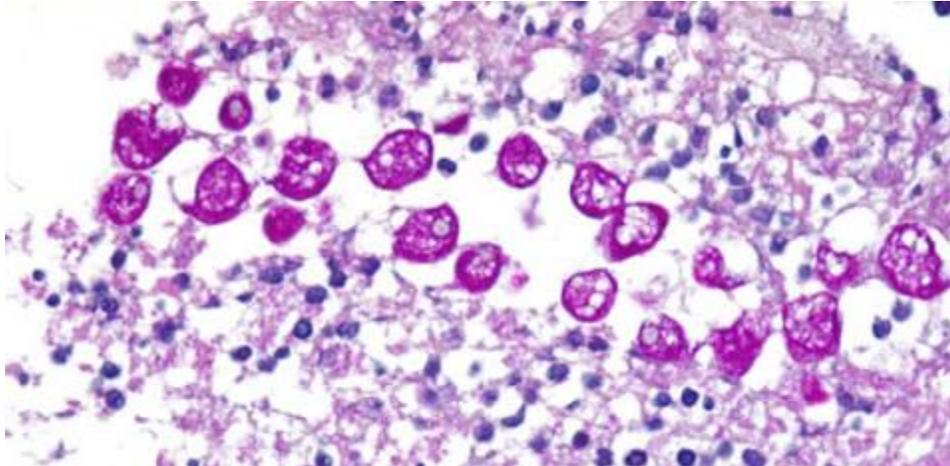
This was a case of invasive amebiasis caused by *Entamoeba histolytica*. Morphologic features seen in the images included: (1) the presence of trophozoites in tissue with a single nucleus that contained peripheral chromatin and a central karyosome, and (2) trophozoites with ingested red blood cells. Other diagnostic tests would be the routine O&P exam, antigen detection, and serology for antibody.

#### **Comments on the Patient:**

**Intestinal Disease.** Although the exact mode of mucosal penetration is not known, microscopy studies suggest that amebae have enzymes which lyse host tissue, possibly from lysosomes on the surface of the amebae or from ruptured organisms. Amebic ulcers most often develop in the cecum, appendix, or adjacent portion of the ascending colon; however, they can also be found in the sigmoidorectal area. From these primary sites, other lesions may occur. Ulcers are usually raised, with a small opening on the mucosal surface and a larger area of destruction below the surface, i.e., “flask shaped.” The mucosal lining may appear normal between ulcers.

#### **Comments on Diagnosis:**

**Histology.** A histologic diagnosis of amebiasis can be made when the trophozoites within the tissue are identified. Organisms must be differentiated from host cells, particularly histiocytes and ganglion cells. Periodic acid-Schiff staining is often used to help locate the organisms. The organisms appear bright pink with a green-blue background (depending on the counterstain used (see image below)). Hematoxylin and eosin staining also allows the typical morphology to be seen, thus allowing accurate identification. As a result of sectioning, some organisms exhibit the evenly arranged nuclear chromatin with the central karyosome and some no longer contain the nucleus.



PAS

**Routine Ova and Parasite Exam (O&P):** The standard ova and parasite examination is the recommended procedure for recovery and identification of *E. histolytica* in stool specimens. Microscopic examination of a direct saline wet mount may reveal motile trophozoites, which may contain RBCs. However, the number of times these trophozoites with RBCs are present is limited. In many patients who do not present with acute dysentery, trophozoites may be present but do not contain RBCs and the organisms may be *E. histolytica* or *E. dispar*. An asymptomatic individual may have few trophozoites and possibly only cysts in the stool. Although the concentration technique is helpful in demonstrating cysts, the most important technique for the recovery and identification of protozoan organisms is the permanent stained smear (normally stained with trichrome or iron hematoxylin). A minimum of three specimens collected over a time frame of not more than 10 days is recommended.

**Antigen Detection.** A number of enzyme immunoassay reagents are commercially available for fecal specimens, and their specificity and sensitivity provide excellent options for the clinical laboratory. Some test reagents can actually separate *E. histolytica* from the nonpathogenic *E. dispar*. The majority of these procedures use the enzyme-linked immunosorbent assay (ELISA) or enzyme immunoassay (EIA) formats. However, in some cases they have been found to be less sensitive than PCR and in other instances they have been found equal to PCR.

**Antibody Detection:** Serologic testing for intestinal disease is normally not recommended unless the patient has true dysentery; even in these cases, the titer (indirect hemagglutination as an example) may be low and thus difficult to interpret. The definitive diagnosis of intestinal amebiasis should not be made without demonstrating the organisms. For patients suspected of having extraintestinal disease, serologic tests are much more relevant. Indirect hemagglutination and indirect fluorescent-antibody tests have been reported positive with titers of  $\geq 1:256$  and  $\geq 1:200$ , respectively, in almost 100% of cases of amebic liver abscess. Positive serologic results, in addition to clinical findings, make the diagnosis highly probable. In the absence of STAT serologic tests for amebiasis (tests with very short turnaround times for results), the decision about the identity of the causative agent often must be made on clinical grounds and on the basis of results of other diagnostic tests such as scans. The fact the patient had an intestinal ulcer would most likely demonstrate a positive serology for antibody.

## **Epidemiology and Prevention**

Infections with *E. histolytica* are worldwide in distribution and are generally most prevalent in the tropics. In 1984, 500 million people were estimated to be infected with *E. histolytica*, and 40 to 50 million of these had extensive symptoms including colitis or extraintestinal abscesses. It is estimated that there are 100,000 deaths each year. Prevalence figures for the United States are generally thought to be ~5%. It has also been estimated that for every case of invasive disease diagnosed, there are at least 10 to 20 asymptomatic individuals excreting infective cysts.

Population groups with a higher incidence of amebiasis include recent immigrants and refugees from South and Central America and from Southeast Asia. Residents in southeastern and southwestern parts of the United States also tend to have more infections with intestinal parasites, as do groups such as patients in mental institutions. The fact the patient had no travel history will certainly not rule out the possibility of amebiasis.

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