Massive perianal ulceration: \textit{Entamoeba histolytica} and \textit{Candida albicans} co-infection

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\section*{INTRODUCTION}

Although \textit{Entamoeba histolytica}, named for its notorious tissue-lysing facility, is a major cause of morbidity and mortality worldwide, cutaneous involvement is rare. Presentation in nonendemic countries is exceptionally rare.

We present a case of amebiasis cutis presenting as a deeply invasive perianal ulceration. Delayed diagnosis, empiric use of broad-spectrum antibiotics, and systemic corticosteroids provided fertile ground for \textit{Candida albicans} co-infection. This case highlights the tissue destructive nature of \textit{E histolytica} and the potential for candidiasis to potentiate this tissue destruction.

\section*{CASE REPORT}

After a flight from India to the United States, a 76-year-old, nondiabetic, immunocompetent man had rectal bleeding attributed to manual disimpaction for constipation relief. Over the next 2 weeks, he complained of abdominal discomfort, fever, and a wound around his rectum. Trimethoprim/sulfamethoxazole prescribed by an urgent care center provided no improvement. He was admitted to the hospital where physical examination found a well-circumscribed 5-cm perianal ulceration with deep necrosis and adjacent erythema. Laboratory tests on admission found a white blood cell count of 20,600/mm\textsuperscript{3} and normal liver enzymes. Bacterial culture of the wound grew mixed skin flora. Polymerase chain reaction test for herpes was negative. Computerized axial tomography found a soft-tissue abnormality posterior to the rectum without other intra-abdominal conditions. Nonspecific ulcerations of the ascending colon and cecum were biopsied during colonoscopy. Pathology results showed architecturally normal inflamed colonic mucosa. The wound dramatically worsened despite broad-spectrum antibiotics. Given concern for pyoderma gangrenosum, systemic corticosteroid therapy was initiated (Fig 1).

Corticosteroid administration did not lead to clinical improvement, and the patient’s white blood cell count increased to 45,000/mm\textsuperscript{3}. The dermatology department was consulted and punch biopsies performed. Histopathology found extensive tissue necrosis and a neutrophilic inflammatory infiltrate (Fig 2). Also noted were scattered large round periodic acid–Schiff (PAS) stain–positive cells containing a solitary nucleus and abundant amphophilic cytoplasm characteristic of amoebic trophozoites (Figs 2 and 3). PAS-positive spores and pseudohyphal structures indicative of yeast superinfection were also identified (Fig 4).

Tissue culture grew \textit{C albicans}. The patient was treated with intravenous metronidazole and oral fluconazole. Fever resolved within 48 hours. The perianal wound underwent pulse lavage and surgical debridement leaving a 15-cm defect with exposed coccyx. Temporary laparoscopic diverting loop ileostomy, partial primary closure, rotation flap, and skin grafting were required for wound healing.
DISCUSSION

Worldwide, *Entamoeba histolytica* is a common cause of infectious colitis and liver abscesses, and the second leading cause of death from parasitic disease. Yet, cutaneous involvement is unusual. Much of the literature on cutaneous disease has come from Mexico where, likely because of availability of appropriate therapy, the incidence has significantly waned. A retrospective analysis published in 2012 involving 2 large Mexican institutions and covering more than a 50-year period identified only 26 cases. A review of 5097 patients treated in South Africa for invasive amebiasis identified only 2 cases with cutaneous disease. Much of the recent literature on cutaneous amebiasis consists of rare case reports.

*E histolytica* plagues communities in which the water and food supply are contaminated by human feces. Infection occurs after ingestion of cysts, which develop into trophozoites that colonize the intestine and feed on gut bacteria. After multiplying and encysting, the parasite is excreted into stool as both cysts and trophozoites. Amebiasis cutis occurs when virulent trophozoites from the bowel come into prolonged contact with traumatized skin. Thus, infants and children in diapers are at increased risk. Local trauma from efforts to relieve constipation may have precipitated our patient’s cutaneous infection. Sexual transmission is well documented, particularly in those who practice anal intercourse. Notably, tracks from needle aspiration or surgical drainage of liver abscesses can act as conduits for cutaneous disease. Skin infection at more distant locations is much less common.

Fig 1. Indurated erythema surrounds a rapidly expanding, deeply necrotic perianal ulceration.

Fig 2. Several round organisms with pale foamy, basophilic cytoplasm and a solitary nucleus characteristic of amoebic trophozoites are visible within a brisk inflammatory infiltrate and surrounding necrotic debris. (Hematoxylin-eosin stain; original magnification: ×400.)

Fig 3. PAS stain highlights the large unicellular protozoa within necrotic tissue. (Original magnification: ×400.)

Fig 4. PAS stain shows a dense collection of spores, budding yeast, and pseudohyphae, characteristic of invasive candidiasis. (Original magnification: ×100.)
of exudate or a scraping of the wound edge and on hematoxylin-eosin staining of tissue. Tissue visualization is enhanced with PAS or immunoperoxidase and antilectin antibody staining. The need for extensive tissue debridement as in the current case, loss of genitalia and urethra, and subsequent reconstructive surgery are documented sequelae of delayed diagnosis.

Amoebic ulceration is fueled by apoptosis and destructive proteases including hyaluronidase, collagenase, N-acetylglucosaminidase, and phospholipase-A. On contact, motile trophozoites cause cytolysis of host cells including neutrophils, which then release additional tissue destructive enzymes. In a 2003 Lancet seminar, Samuel L. Stanley Jr suggests physicians “Think of this protozoan parasite as a macrophage on steroids with pumped-up phagocytic, proteolytic, and cytolytic capabilities.” It follows that concomitant use of systemic corticosteroids fuels the protozoan’s virulence, increasing the incidence of toxic megacolon, intestinal perforation, and liver abscess; worsening of cutaneous ulceration and candidiasis as in this case is not surprising.

The relationship between *E histolytica* and gut microbiota is complicated; research suggests that specific commensals likely promote asymptomatic amoebic colonization, whereas others likely enhance mucosal inflammation and amoebic virulence. Co-infection of amoebic liver abscesses with gut microbiota and *Entamoeba dispar*, a species of *Entamoeba* generally considered nonpathogenic, is well-documented. The literature discussing cutaneous amebiasis-bacterial co-infection is sparse; yet, bacterial co-infection potentiating the pathogenicity of *E histolytica* in such instances has been postulated. The possibility of *C albicans* and *E histolytica* potentiating the virulence of one another has not been discussed previously but is intriguing especially given the histopathology in this case. In certain laboratory settings, the virulence of *C albicans* is found to be enhanced by bacteria including *Pseudomonas aeruginosa*, *Escherichia coli*, and *Staphylococcus epidermidis*. Clinically, candidemia is found to be more lethal in the setting of bacterial co-infection. The current case suggests that *C albicans* and *E histolytica* are also a dangerous duo.

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