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Presumptive Diagnosis of Amebic Appendicitis Supported by Periappendiceal Histopathology, Managed Successfully Without Appendectomy

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Patient: Female, 36-year-old
Final Diagnosis: Amebic appendicitis
Symptoms: An acute onset of right lower abdominal pain • low-grade fever
Clinical Procedure: —
Specialty: Infectious Diseases

Objective: Unusual clinical course

Background: Acute appendicitis caused by *Entamoeba histolytica* is rare and clinically difficult to distinguish from non-amebic appendicitis, yet it carries a higher postoperative morbidity and mortality risk. While a definitive diagnosis is typically established postoperatively, this case is notable in that histopathological evidence of invasive amebiasis at the appendiceal orifice was obtained prior to a planned interval appendectomy, and the patient was successfully treated without surgical intervention.

Case Report: We report a case of amebic appendicitis in a 36-year-old heterosexual woman living in a non-endemic country. Despite conventional antibiotic therapy, her abdominal symptoms persisted while she remained clinically stable, and interval appendectomy was planned. Colonoscopy performed as part of the preoperative assessment before planned interval appendectomy revealed erosive lesions at the appendiceal orifice. Histopathological evidence of invasive amebiasis at the appendiceal orifice, together with computed tomography findings consistent with acute appendicitis and her epidemiologic risk factors, strongly supported the preoperative diagnosis of amebic appendicitis, and the patient was successfully treated conservatively with metronidazole and paromomycin. A follow-up colonoscopy 3 months later showed complete mucosal healing, and she has remained recurrence-free for 5 years.

Conclusions: Even when patients do not fit the demographic classically associated with amebiasis, an atypical clinical course combined with a detailed social history can raise clinical suspicion for amebic appendicitis. Such preoperative recognition is crucial, as it may allow for targeted medical therapy and potentially avoid unnecessary surgical intervention.

Keywords: Appendicitis • *Entamoeba histolytica*

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Introduction

Acute appendicitis is one of the most frequently encountered acute abdominal conditions. The main etiology of appendicitis is luminal obstruction caused by fecaliths or lymphoid hyperplasia [1]. Amebic involvement of the appendix is relatively uncommon, with *Entamoeba histolytica* trophozoites reported in approximately 0.5% to 2% of appendectomy specimens in endemic areas [1]. However, acute amebic appendicitis carries a high postoperative complication rate of 25.4%, distinctly higher than the 1% to 5% reported for non-amebic appendicitis, and a mortality rate of 3.2%, which has also been reported to exceed that of non-amebic cases [1]. Since these rates significantly exceed those for non-amebic cases, accurate diagnosis and appropriate treatment are crucial.

Amebic appendicitis is caused by the invasion of appendiceal tissue by the trophozoite form of the protozoan *E. histolytica*. It is more frequent in tropical and subtropical regions with poor hygiene conditions. Historically, in developed countries, amebiasis has been frequently reported among men who have sex with men populations [2]. However, recent epidemiological data from Japan suggest an increasing proportion of cases associated with heterosexual transmission [3]. Of 9946 amebiasis cases reported in Japan from 2000 to 2013, 7403 were domestically acquired, with the proportion increasing from 63% to 85% [3].

The diagnosis remains challenging because, particularly in patients without typical risk factors such as travel history to high-risk countries or recognized sexual exposure risks, the clinical presentation closely resembles that of typical bacterial appendicitis. Most cases of amebic appendicitis are definitively diagnosed postoperatively by pathological examination following appendectomy [1].

Preoperative diagnosis of amebic appendicitis is infrequent. To the best of our knowledge, preoperative recognition of amebic appendicitis supported by histopathological evidence has only rarely been described.

Herein, the primary contribution of this report is to illustrate that histopathological evidence of invasive amebiasis obtained during interval evaluation may support the preoperative recognition of amebic appendicitis and permit targeted medical management without immediate surgical intervention.

Case Report

A 36-year-old woman with cervical dysplasia presented with an acute onset of right lower abdominal pain and low-grade fever. At approximately 3: 00 AM on the day of presentation, she developed epigastric pain, which later migrated to the right lower quadrant of the abdomen. She noted a low-grade fever around 37.5 °C and sought medical attention because the pain persisted.

On physical examination, there was slight epigastric tenderness, with maximal tenderness localized to the right lower quadrant, including McBurney's point. Rebound tenderness was present; guarding and rigidity were not noted. Laboratory testing showed leukocytosis, with a white blood cell count of 15 200/μL. Renal function, liver function, and electrolytes were all unremarkable.

Contrast-enhanced abdominal computed tomography (CT) showed a dilated appendix compatible with acute appendicitis (**Figure 1**). Because she was in clinically stable condition, and the appendicitis appeared uncomplicated, initial nonoperative management was selected. She received a single dose of ceftriaxone on the day of presentation, followed by a 7-day oral course of levofloxacin 500 mg once daily and metronidazole 500 mg 3 times daily as an outpatient. Although her symptoms improved after antimicrobial therapy, an interval appendectomy was scheduled due to persistent residual abdominal

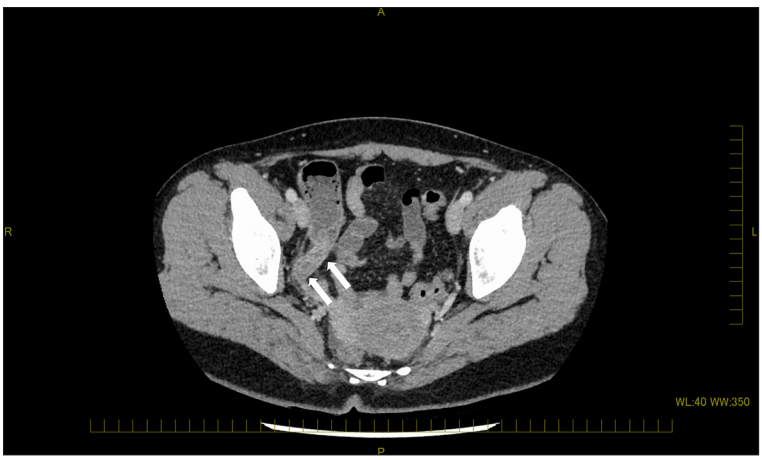


Figure 1. Contrast-enhanced CT image showing a dilated appendix (arrow), consistent with acute appendicitis.

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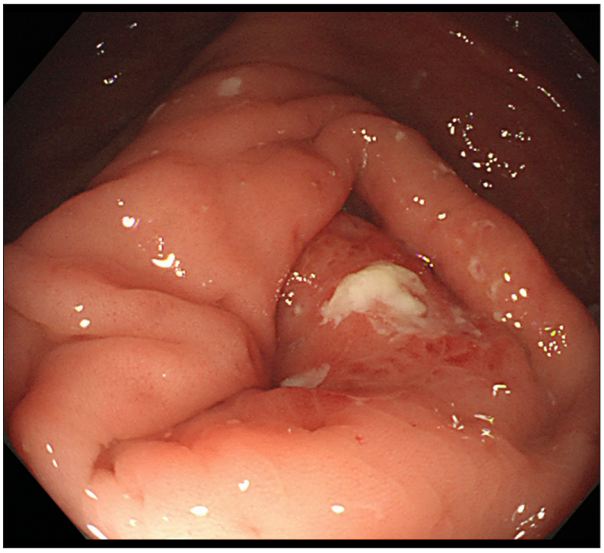


Figure 2. Colonoscopy showing erosion of the appendiceal orifice, before anti-amebic therapy.

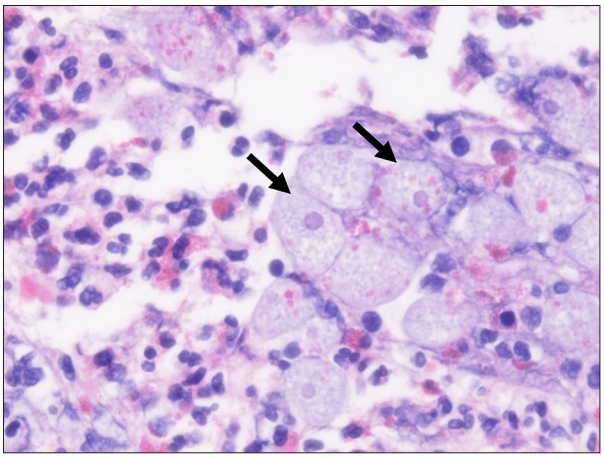


Figure 3. Biopsy showing amebic trophozoite invasion (arrow). Hematoxylin and eosin staining (× 40).

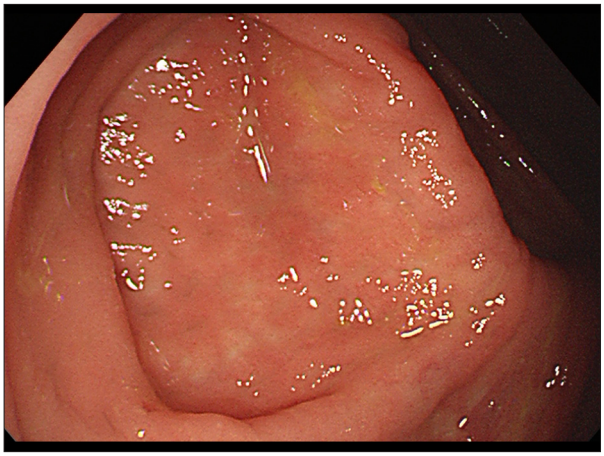


Figure 4. Follow-up colonoscopy showing complete mucosal healing of the appendiceal orifice, after treatment with metronidazole and paromomycin.

discomfort and concern for recurrent appendicitis. As part of the routine preoperative evaluation before interval appendectomy, colonoscopy was performed 6 months later and revealed erosion of the appendiceal orifice (**Figure 2**). Given this unexpected finding, biopsy specimens were obtained from the appendiceal orifice, and histopathological examination showed amebic trophozoite invasion (**Figure 3**). Together with the CT findings consistent with acute appendicitis, this strongly supported the diagnosis of amebic appendicitis. She reported engagement in commercial sexual activity and also had a male partner who frequently traveled to Southeast Asia. She usually used condoms for vaginal intercourse but not for oral sex. These epidemiologic factors were consistent with the diagnosis of invasive amebiasis.

Stool and serologic testing were not performed because stool examination can detect only luminal organisms and has limited sensitivity, and serology cannot reliably distinguish current

Table 1. Clinical timeline of the patient.

Time point	Clinical course
Initial presentation	Abdominal pain; CT consistent with appendicitis
Antibiotic treatment	Single dose of ceftriaxone, followed by a 7-day course of oral levofloxacin and metronidazole
After treatment	Residual abdominal discomfort persisted
Planned surgery	Interval appendectomy planned
6 months after initial presentation	Colonoscopy: erosion at appendiceal orifice; biopsy: invasive amebiasis
Anti-amebic therapy	Metronidazole and paromomycin
3 months after anti-amebic therapy	Follow-up colonoscopy: mucosal healing
5-year follow-up	No recurrence

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from past infection; moreover, histopathological confirmation of invasive amebiasis had already been established from colonoscopic biopsy, and additional testing was not expected to alter clinical management.

She was treated with metronidazole 750 mg thrice daily for 10 days, followed by paromomycin 500 mg thrice daily for 10 days. Follow-up colonoscopy 3 months later showed complete mucosal healing (**Figure 4**). The condition was considered fully resolved, and surgery was avoided. At the 5-year follow-up, she had remained free of recurrence (**Table 1**).

Discussion

E. histolytica infection has a broad clinical spectrum ranging from asymptomatic carriage to intestinal and extraintestinal amebiasis. Following ingestion, the cysts typically disintegrate in the small bowel and release trophozoites into the colon [4]. Normally, trophozoites live superficially in the colon, particularly in the cecum and ascending colon, where they feed on bacteria and mucosal cells [4]. In some cases, they invade deeper and enter the portal circulation to cause extraintestinal manifestations in the liver, brain, pleura, and skin [4].

Amebic appendicitis is regarded as a rare intestinal manifestation of invasive amebiasis [1]. Activated trophozoites are thought to invade the appendiceal wall rather than the adjacent colonic mucosa, causing acute appendicitis [5].

Amebic appendicitis represents a significant diagnostic challenge, particularly in non-endemic regions. It is difficult to differentiate from non-amebic appendicitis preoperatively, as amebiasis-specific symptoms, such as bloody diarrhea, are reported to be infrequent at presentation [5]. Consequently, most cases are definitively diagnosed postoperatively through histopathological examination [1].

For differential diagnosis outside of endemic areas, a meticulous history focusing on risk factors, such as travel to high-risk regions or sexual practices, is crucial, as these elements are often underappreciated. It is essential to recognize that the fundamental mode of transmission is oral-anal contact, which is not exclusive to the men who have sex with men population. Japanese data from a study analyzing 10 930 patients who underwent colonoscopy at the National Center for Global Health and Medicine in Tokyo between 2003 and 2009 reported that 54 patients (0.50%) were diagnosed with amebic colitis [2]. The prevalence showed an increasing trend over the study period, rising from 0.16% in 2003 to 0.88% in 2009, representing a 5.5-fold increase [2]. The key lesson from this case is that amebic appendicitis should be included in the differential diagnosis when symptoms do not improve despite standard treatment for acute appendicitis, particularly in patients with a history of high-risk sexual contact or travel to endemic regions.

A delay in diagnosis carries critical prognostic implications. Amebic appendicitis is associated with a postoperative complication rate of 25.4% and a mortality rate of 3.2%, both of which are higher than those observed in non-amebic cases [1], suggesting that *E. histolytica* infection should be promptly considered and managed if the course is atypical or refractory to standard therapy.

An additional point of interest is that the patient initially received a 7-day course of metronidazole as part of empiric therapy for appendicitis. However, this treatment was not directed toward confirmed invasive amebiasis and was not followed by a luminal agent. Persistent symptoms despite the initial regimen ultimately prompted further evaluation, leading to histopathological confirmation of amebiasis at the appendiceal orifice, which strongly supported the inferred diagnosis of amebic appendicitis, and subsequent treatment with metronidazole followed by paromomycin.

Pharmacological treatment alone for acute amebic appendicitis may have limited efficacy; for example, in a reported series of 5 patients diagnosed preoperatively, only 2 achieved symptomatic relief, necessitating appendectomy in the remaining 3 patients [1]. Therefore, surgical intervention remains a critical treatment option. Although pathological confirmation of the appendix itself was not available because surgery was avoided, the coexistence of CT findings consistent with acute appendicitis and histopathologically confirmed amebiasis involving the appendiceal orifice strongly suggested amebic appendicitis as the most likely diagnosis. The reason conservative treatment succeeded in our patient remains uncertain. One hypothesis is that the inflammatory process was predominantly localized to the appendiceal orifice and adjacent periappendiceal mucosa, allowing resolution with anti-amebic therapy before irreversible appendiceal damage developed. In addition, considering the high complication and mortality rates after surgical intervention, appropriate pharmacological treatment remains essential even when surgical intervention is performed [1].

In this case, the patient, a heterosexual woman residing in a non-endemic country, presented with right lower quadrant pain, placing her outside the demographic classically associated with amebiasis in developed countries. Despite standard treatment for non-amebic appendicitis, her symptoms did not fully resolve, and interval appendectomy was planned. During the interval evaluation before the planned appendectomy, colonoscopy unexpectedly revealed erosive lesions at the appendiceal orifice, and biopsy of this site showed histopathological evidence of invasive amebiasis. Together with CT findings

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consistent with appendicitis, this strongly supported the diagnosis of amebic appendicitis. Her sexual history, including a partner who frequently traveled to Southeast Asia, was consistent with this diagnosis. Based on this diagnosis, the patient was successfully treated with appropriate courses of metronidazole and paromomycin, thus avoiding the need for appendectomy. At the time of this report, she had been followed for over 5 years without any recurrence of appendicitis or other amebiasis symptoms.

It is important to acknowledge the boundary conditions of this report. The diagnostic opportunity in this case arose in a clinically stable patient undergoing planned interval evaluation, rather than in an undifferentiated emergency presentation. Colonoscopy was performed only as part of the preoperative evaluation before a planned interval appendectomy; this case does not support routine colonoscopy in acute appendicitis, but rather reflects the identification of a key etiologic clue during interval evaluation in a selected patient. Therefore, this case suggests that the feasibility of preoperative recognition and targeted medical management may be possible specifically in carefully selected patients who exhibit an atypical clinical course and possess relevant epidemiologic clues. Further studies are needed to determine how frequently this diagnostic approach may be applicable in patients undergoing interval appendectomy.

Conclusions

This case highlights the importance of considering amebiasis in patients with appendicitis who have an atypical clinical course or epidemiologic risk factors, even in non-endemic settings. Colonoscopic evaluation performed before interval appendectomy may occasionally reveal an alternative diagnosis. This case suggests that, in carefully selected patients undergoing interval evaluation, preoperative recognition of amebic appendicitis may permit targeted medical therapy without immediate appendectomy.

Patient Permission

Informed consent was obtained from the patient for publication of this case report.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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