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Case report

Malaria mimicking acute appendicitis in an Ethiopian child: a case report

Yemane Leake[1*], Teklay Solomon[2], Hindeya Hailu[1], Birhanu Kassie Reta[3]

[1] Department of Pediatrics and Child Health, School College of Health Science, Aksum University, Aksum, Ethiopia.

[2] Department of Surgery, Abiy-Adi General Hospital, Tigray Regional Health Bureau, Abiy-Adi, Ethiopia.

[3] Department of Pathology, College of Health Science, Aksum University, Aksum, Ethiopia.

*Corresponding author: ylyemane2010@gmail.com

Abstract

Malaria remains a significant public health problem in Ethiopia, caused by Plasmodium species and presenting with variable clinical features. We report an 8-year-old Ethiopian boy with right lower abdominal pain, fever, and tenderness suggestive of acute appendicitis. Laboratory tests were unremarkable, and appendectomy revealed a normal appendix. Persistent postoperative fever prompted malaria testing, which was positive for Plasmodium falciparum. Antimalarial treatment led to rapid recovery, and the patient was discharged on the fourth day of admission. This case highlights that malaria can mimic appendicitis in endemic regions. Preoperative malaria evaluation may prevent unnecessary surgery and ensure timely treatment.

Keywords: *Appendicitis, Case report, Ethiopia, Malaria, Tigray*

Background

Malaria remains a major public health problem in Ethiopia, where approximately 75% of the land area is considered malarious and about 52% of the population is at risk of infection(1). A systematic review and meta-analysis published in 2021 reported a pooled malaria prevalence of 15.39% among Ethiopian children (2). Human malaria is caused by five *Plasmodium* species: P. *falciparum*, P. *vivax*, P. *ovale*, P. *malariae*, and P. *knowlesi* (1,3). Although malaria commonly presents with fever, chills, and constitutional symptoms, its clinical manifestations can be variable and may include gastrointestinal symptoms and abdominal pain (4–9).

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Malaria presenting with features suggestive of acute appendicitis is uncommon and may lead to unnecessary surgical intervention. Previous reports have described children who underwent appendectomy for presumed acute appendicitis and were subsequently diagnosed with malaria (5,10,11). We report an 8-year-old child with *P. falciparum* malaria who presented with clinical features suggestive of acute appendicitis and underwent appendectomy before malaria was diagnosed.

Case presentation

History and physical examination

An 8-year-old Ethiopian boy from a malaria-endemic area presented to the emergency department with a two-day history of fever, abdominal pain, vomiting, and loss of appetite. The abdominal pain initially started in the periumbilical region and subsequently migrated to the right lower abdomen. He had three episodes of non-projectile vomiting and experienced high-grade fever, chills, and rigors. There was no abdominal distension, and passage of stool and flatus was normal. He had no previous history of malaria, urinary symptoms, or chronic illness.

On examination, the child appeared acutely ill and febrile, with a temperature of 38.8°C. Abdominal examination revealed right lower-quadrant direct and rebound tenderness. The remainder of the physical examination was unremarkable.

Diagnostic assessment

Laboratory investigations showed a hemoglobin level of 11.9 g/dL and random blood glucose of 126 mg/dL. Other hematological parameters, urinalysis, stool examination, renal and liver function tests, and electrolytes were unremarkable. C-reactive protein was not performed because it was unavailable. Abdominopelvic ultrasonography showed minimal fluid collection with probe tenderness, but the appendix was not visualized.

Treatment and follow-up

Based on the clinical presentation, acute appendicitis was suspected. After obtaining written informed consent from his parents, the child underwent appendectomy. Intraoperatively, the appendix appeared macroscopically normal (Figure 1).

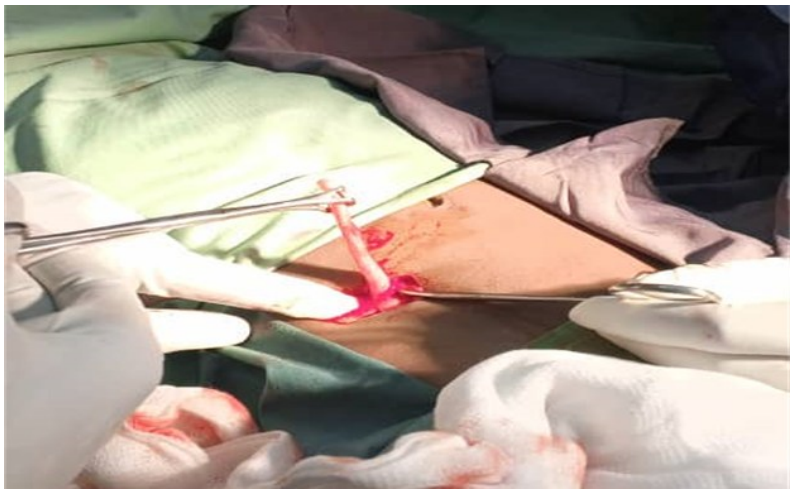

Figure 1. Intraoperative photograph showing a macroscopically normal appendix.

Postoperatively, he continued to have high-grade fever, reaching 39.2°C. Because of his residence in a malaria-endemic area and persistent fever, a malaria rapid diagnostic test was performed and was positive for *P. falciparum* (**Figure 2**). The diagnosis was subsequently confirmed by peripheral blood film examination.

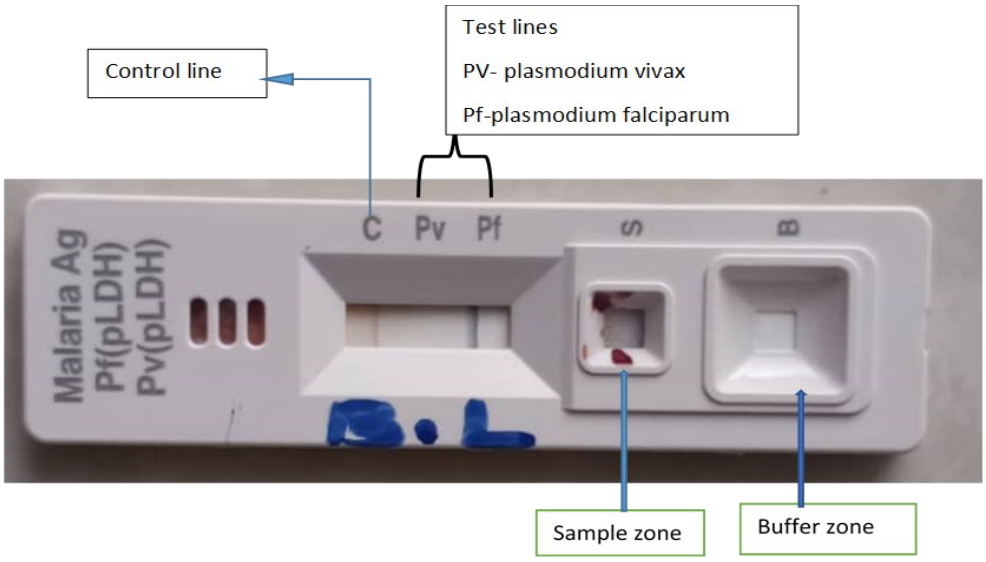

Figure 2. Rapid diagnostic test (RDT) demonstrating a positive Plasmodium falciparum result in the patient's blood sample.

The patient was treated according to Ethiopian national and WHO malaria treatment recommendations, initially receiving weight-based intravenous artesunate followed by oral artemether–lumefantrine and a single dose of weight based premaquine. Intravenous therapy was initially used because persistent vomiting during the immediate postoperative period

made oral treatment difficult. He became afebrile and showed marked clinical improvement. He was discharged in good condition on the fourth postoperative day with oral artemether–lumefantrine and paracetamol as needed. At follow-up, he remained clinically well.

Discussion

This case illustrates an uncommon presentation of P. falciparum malaria mimicking acute appendicitis in a child. The patient's fever, vomiting, migration of abdominal pain to the right lower quadrant, and rebound tenderness were clinically compatible with acute appendicitis. However, the appendix appeared normal during surgery, while persistent postoperative fever prompted consideration of malaria and subsequent diagnostic testing.

Malaria with acute abdominal symptoms can mimic a surgical abdomen and pose a diagnostic challenge. Previous reports have described children with malaria presenting as suspected appendicitis, including cases managed medically and others undergoing appendectomy, sometimes with concurrent appendicitis(10,12,13) . More recently, P. falciparum malaria has been reported with acute abdominal pain as the initial presentation(4) , and malaria-associated duodenal perforation has also been described (9). In our 8-year-old patient, the appendix appeared macroscopically normal, and P. falciparum was subsequently detected. However, the absence of histopathological examination limits definitive attribution of the abdominal findings to malaria. Therefore, malaria should be considered in febrile children presenting with features suggestive of acute appendicitis in endemic settings.

In our patient, the appendix appeared macroscopically normal, and malaria was confirmed postoperatively. The rapid clinical response to antimalarial treatment supported malaria as the most likely cause of the febrile illness and abdominal presentation. However, a causal relationship cannot be definitively established because histopathological examination was unavailable, and microscopic appendiceal inflammation or other pathology cannot be excluded.

The mechanism by which malaria may produce abdominal symptoms remains incompletely understood. Gastrointestinal manifestations have been described in malaria, particularly in severe disease, and may include abdominal pain, vomiting, intestinal obstruction, gastrointestinal bleeding, and other abdominal complications (4,5,8,9,11,14). However, the present case did not demonstrate evidence of bowel obstruction, perforation, gastrointestinal bleeding, or other intra-abdominal complications. Therefore, it would be inappropriate to attribute the patient's presentation to a specific gastrointestinal pathological mechanism.

The clinical implication of this case is particularly relevant in malaria-endemic settings. Febrile children presenting with acute abdominal

pain may have malaria despite having clinical findings that strongly suggest appendicitis. In our patient, malaria was considered only after surgery because the clinical presentation closely resembled acute appendicitis. Although malaria testing cannot replace appropriate assessment for appendicitis, it may be useful in febrile patients from endemic areas, particularly when the presentation is atypical or when fever persists despite surgical management.

A major limitation was the lack of histopathological examination of the appendix due to unavailable services at our hospital, partly related to health-system and infrastructure disruptions following the Tigray conflict (15–17). C-reactive protein was also unavailable, and the appendix was not visualized by ultrasonography, limiting assessment of concomitant appendiceal pathology. Nevertheless, this case highlights the importance of considering malaria in febrile children presenting with acute abdominal symptoms in endemic areas.

Conclusion

P. Falciparum malaria can present with clinical features that closely resemble acute appendicitis in children. In malaria-endemic settings, malaria should be included in the differential diagnosis of febrile children presenting with acute abdominal pain. Appropriate consideration and timely testing may facilitate early diagnosis and treatment and potentially reduce unnecessary surgical intervention.

Abbreviations

RDT: Rapid diagnostic test

WHO: World Health Organization

Declarations

Ethics approval

The study was notified to the Aksum University College of Medicine and Health sciences ethics committee; however, as this is a case report, specific ethical approval was not required.

Consent for publication

Written informed consent was obtained from the patient's parents for publication of this case report. A copy of the written consent is available for review by the editor-in-chief of this journal on request.

Availability of data and materials

Data sharing is not applicable to this article as no data sets were generated or analysed during the current study.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Authors' contribution

YL: Conceptualization, Visualization, Supervision, Writing- Original draft preparation. TS: Conceptualization, Data curation, Writing- Original draft preparation. HH: Visualization, Investigation, Writing original draft. BK: Writing- Reviewing and Editing.

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