Archives of Academic Emergency Medicine. 2024; 12(1): e11

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CASE REPORT

Coincidence of Ascariasis with Appendicitis in a Pediatric Patient with abdominal Pain; a Case Report

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Received: November 2023; Accepted: December 2023; Published online: 16 November 2023

Abstract: The simultaneous occurrence of intestinal ascariasis and appendicitis presents a challenge in diagnosing pediatric abdominal emergencies due to overlapping symptoms. We present the case of an 8-year-old boy who experienced acute abdominal pain, characterized by a severe cramp in the mid and lower right abdomen, with pain rated 7 out of 10, a mild fever, and continuous nausea. The initial evaluation suggested appendicitis, supported by an Alvarado score of 9. However, ultrasonography did not conclusively confirm appendicitis but revealed an Ascaris worm in the ileum. This finding highlights the importance of careful diagnostic processes that combine clinical assessment with imaging techniques, while being mindful of their limitations. Surgical exploration confirmed retrocecal appendicitis coexisting with an Ascaris lumbricoides infection. The treatment involved surgical removal of the affected appendix and pharmacological expulsion of the parasitic worm using albendazole, which proved effective. This report emphasizes the consideration of ascariasis in diagnosing appendicitis, particularly in areas where intestinal parasites are common. It also demonstrated the improved diagnostic accuracy achieved through clinical scoring and imaging, thus reducing the risk of missing dual pathologies in young patients with acute abdominal pain.

Keywords: Ascariasis; Ultrasonography; Diagnostic imaging; Ascaris lumbricoides; Pediatric emergency medicine; Appendicitis

Cite this article as: Aalinezhad M, Jafarpishe MS, Naderi Y, et al. Coincidence of Ascariasis with Appendicitis in a Pediatric Patient with abdominal Pain; a Case Report. Arch Acad Emerg Med. 2024; 12(1): e11. https://doi.org/10.22037/aaem.v12i1.2187.

1. Introduction

Ascaris lumbricoides is the largest roundworm that can infect the human intestine and poses a significant health burden. An estimated 760 million people are infected, globally, although many infections are asymptomatic (1). The surgical manifestations of Ascaris infestation vary and are often linked to its migratory behavior through the gastrointestinal and biliary tracts. Although Ascaris-associated appendicitis is rare, its role in the development of acute appendicitis remains debated (2). Appendicitis is a prevalent cause of acute abdominal pain worldwide and obstruction of the appendiceal lumen is the primary etiological factor. The lifetime risk of appendicitis is 7-14%, making it the leading cause of emergency abdominal surgery (3). Intestinal ascariasis is considered a less frequent but significant cause, particularly in endemic regions, such as southeast Asia, Africa, and south America, where Ascaris lumbricoides can range from 1% to 27% among children (4).

Ultrasound has revolutionized the diagnostic landscape by providing a noninvasive and quick method to evaluate abdominal complaints. However, it may not always be effective in differentiating between similar symptoms such as ascariasis and appendicitis (5). This case report highlights the importance and limitations of imaging in clinical decision-making by reporting a pediatric patient presenting with symptoms indicative of appendicitis, subsequent identification of the intestinal ascariasis, and his clinical management plan.

2. Case presentation

An 8-year-old boy with low socioeconomic status and no significant past medical or surgical history was brought to the emergency department with intermittent to severe cramping abdominal pain rated 7 out of 10 on the pain scale. The pain, which was intermittent and localized to the periumbilical area and right lower quadrant, had persisted for three days and was accompanied by low-grade fever (38.4°C) and persistent nausea. There was no family history of note. Upon examination, the child exhibited marked tenderness in the

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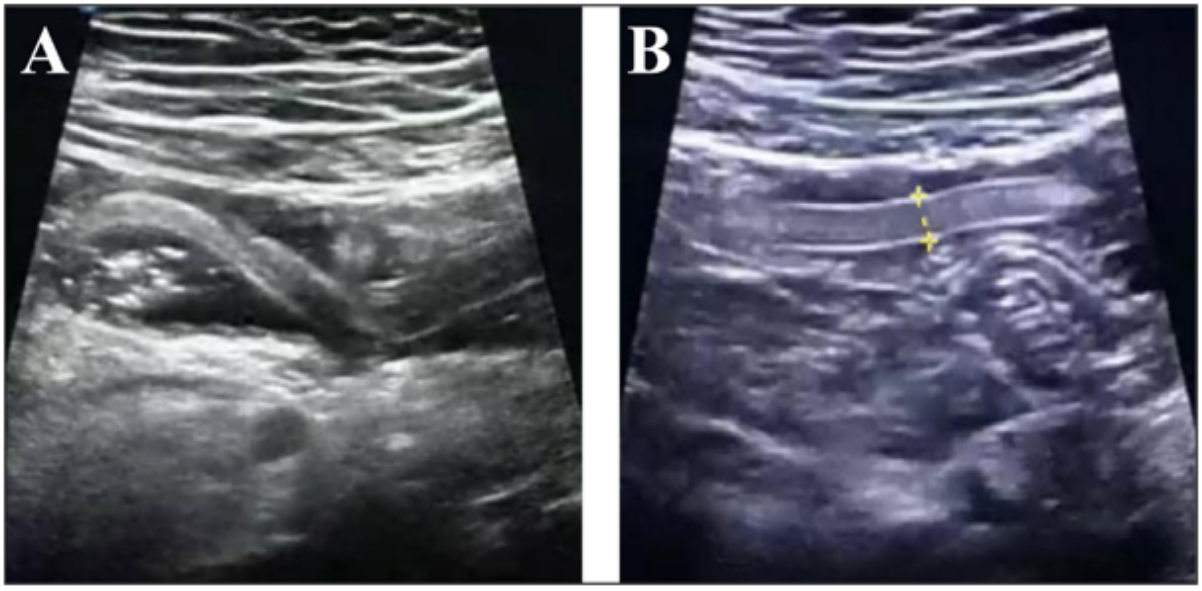

Figure 1: Ultrasonography of the right lower quadrant in transverse (A) and oblique transverse (B) planes. The reflection revealed a tubular hypoechoic structure with a well-defined echogenic wall within the ileal loops proximal to the appendix. This structure was consistent with that of the Ascaris worm.

right lower quadrant with mild rebound tenderness, but no hernias, masses, or scars were noted, and rectal examination was unremarkable. Laboratory findings included leukocytosis with a white blood cell count of 18,500/mcL, neutrophils predominating at 85%, and a platelet count of 200,000/mcL, suggesting an infectious or inflammatory etiology.

Despite acute appendicitis being the primary concern, as reflected by an Alvarado score of 9, we also considered various other potential diagnoses, such as terminal ileitis and mesenteric adenitis. Fortunately, the patient's hemodynamic parameters were stable, with a blood pressure of 90/65 mmHg, heart rate of 93 beats per minute, respiratory rate of 17 breaths/min, and oxygen saturation of 98% on room air, which permitted a short period of monitoring with conservative management such as pain relief and intravenous (IV) rehydration.

Abdominal ultrasonography revealed a tubular hypoechoic structure within the distal ileal loops, suggestive of an Ascaris lumbricoides infestation extending to the appendiceal base (Figure 1). Despite this finding, the sonogram did not exhibit classic signs of appendicitis, such as an aperistaltic, noncompressible, or dilated appendix, or any peri-appendiceal fluid collection.

The differential diagnoses included acute appendicitis, terminal ileitis, mesenteric adenitis, and confirmed intestinal ascariasis. Given the high Alvarado score and presence of neutrophilia, surgical exploration was deemed necessary. Intraoperatively, retrocecal appendicitis was confirmed, and it was observed that the Ascaris had shifted from its location, as indicated by sonographic findings. However, no obstruction or perforation was evident at the site where a worm was palpated approximately 30 cm from the ileocecal valve. Given the positive response and favorable prognosis of intestinal Ascaris infection to medical treatment, performing additional procedures to remove the worm was deemed unnecessary. Instead, the decision was made to proceed with medical treatment following appendectomy. The initial conservative management strategy, which focused on rehydration and analgesia, was adjusted post-operatively to include a single dose of albendazole (400 mg), leading to the successful expulsion of the worm in the patient's stool within 24 hours post-surgery, and the histopathological examination confirmed the co-occurrence of Ascaris lumbricoides infestation and appendicitis. The patient experienced uneventful recovery without any postoperative complications.

3. Discussion

The presented case of an 8-year-old boy with concurrent intestinal ascariasis and appendicitis underscores clinicians' diagnostic challenges in differentiating between these two conditions, especially when both present concurrently. Abdominal sonography was pivotal in identifying the presence of an Ascaris worm; however, it failed to detect appendicitis, which was later confirmed during surgical intervention. This discrepancy between sonographic findings and surgical outcomes raises essential questions regarding the reliability and limitations of ultrasound as a diagnostic tool in such complex

cases.

Abdominal sonography played a crucial role in the timely diagnosis of the case by revealing the presence of an Ascaris worm within the distal ileal loops extending to the appendiceal base. The efficacy of ultrasonography in detecting intestinal and biliary ascariasis has been documented in literature (6). The ability of ultrasound to provide real-time imaging and its non-invasiveness make it a valuable tool for assessing patients with suspected ascariasis and other abdominal pathologies. However, it is essential to note that ultrasonography has limitations in diagnosing appendicitis. Emergency physicians without specialized training may only use it as a limited screening tool (7). In the present case, ultrasonography failed to identify appendicitis, necessitating reliance on clinical judgment and other diagnostic methods. The Alvarado Score was used for diagnosis, yielding a high probability of appendicitis. Although this scoring system is widely accepted, its combination with ultrasound may improve accuracy and reduce negative appendectomy rates, as recommended by Chauhan et al. (8). However, it is essential to acknowledge the limitations of the Alvarado Score and to conduct a comprehensive clinical evaluation in all cases.

Bethony et al. (2006) revealed a high occurrence of ascariasis in developing countries, underlining the importance of recognizing and considering parasitic infections as a possible cause of abdominal pain. This is especially crucial for children, as their symptoms can be nonspecific and variable (9). Management of appendiceal ascariasis has significant implications for clinical practice, as observed in our patient. Ascaris lumbricoides can silently reside in the appendix, mimicking appendicitis, or being discovered incidentally during surgical procedures intended for other conditions, as observed in 72.7% of the cases reviewed by Wani et al. in 2010 (2). None of these cases was diagnosed preoperatively, underlining the need for clinical vigilance and considering ascariasis as a differential diagnosis for appendicitis.

Ascaris has the potential to cause a range of surgical emergencies such as obstruction, volvulus, and perforation, requiring prompt surgical intervention. However, conservative management is preferred for uncomplicated ascariasis, mainly when ascaris is found in the vermiform appendix without signs of acute inflammation, as suggested by Baba et al. (10).

In clinical practice, concurrent management of both ascariasis and appendicitis typically results in a favorable prognosis, provided that proper intervention is administered. It is advisable to conduct ongoing surveillance to observe potential recurrence, particularly in areas where these infections are endemic.

4. Conclusion

The diagnosis of intestinal ascariasis and appendicitis in pediatric patients is challenging. Although ultrasound can detect Ascaris lumbricoides, it may not accurately diagnose appendicitis. An accurate diagnosis requires a comprehensive approach that combines clinical expertise with imaging methods. It is crucial to have a thorough diagnostic process to ensure accurate diagnosis.

5. Declarations

5.1. Acknowledgments

We extend our sincere gratitude to the parents, who granted us permission to use their child's information. We also acknowledge the invaluable contributions of Dr. Seyedeh Sara Ghorbanhosseini and Dr. Mohammad Shahsavan to this study.

5.2. Conflict of interest

None.

5.3. Funding and supports

None.

5.4. Authors' contribution

All authors contributed to the conception and design of the study. MA and MJ wrote the first draft of the manuscript. YN and ZS critically revised the manuscript for intellectual content. MS assisted with writing and editing the manuscript and was responsible for data collection and organization. All authors approved the final version of the manuscript.

5.5. Competing interests

The authors declare that they have no competing interests.

5.6. Ethical consideration and consent

Written informed consent was obtained from the patient's parents, and the study was approved by the Ethics Committee of the Isfahan University of Medical Sciences under the code IR.ARI.MUI.REC.1402.144.

5.7. Using artificial intelligence chatbots

None.

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