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Case Report

Acute appendicitis coexisting with caecal perforation caused by *Ascaris lumbricoides*: a surgical enigma

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ABSTRACT

Ascaris lumbricoides infestation is one of the most common helminthic infections worldwide, particularly in low- and middle-income countries with poor sanitation. Although it has been implicated in several abdominal surgical emergencies, the concurrent occurrence of acute appendicitis and caecal perforation caused by Ascaris lumbricoides is exceedingly rare and has been infrequently reported in literature. We report the case of a 21-year-old female undergraduate who presented with a five-day history of migratory right lower abdominal pain, vomiting, and low-grade fever. Clinical evaluation was suggestive of acute appendicitis, and she underwent emergency open appendicectomy. Intraoperatively, copious peritoneal fluid, an inflamed vermiform appendix, and a pinhole caecal perforation approximately 5 mm from the appendiceal base were identified. An adult *Ascaris lumbricoides* worm was found protruding through the perforation. Appendicectomy, primary repair of the caecal perforation after freshening of the edges, and peritoneal lavage were performed. Histopathological examination confirmed acute inflammation of both the appendix and caecal tissue. The patient received postoperative antibiotics and albendazole, had an uneventful recovery, and was discharged on the fifth postoperative day. The coexistence of acute appendicitis and *Ascaris lumbricoides*-induced caecal perforation is an exceptionally rare surgical entity that may be diagnosed only at operation. In regions where helminthic infestations are endemic, surgeons should maintain a high index of suspicion for concomitant bowel pathologies and routinely inspect the caecum and terminal ileum during appendicectomy to avoid missed diagnoses and improve patient outcomes.

Keywords: Acute appendicitis, *Ascaris lumbricoides*, Caecal perforation, Ascariasis, Case report

INTRODUCTION

Acute appendicitis is one of the most common causes of acute abdomen and remains the leading indication for emergency abdominal surgery worldwide. It is characterized by inflammation of the vermiform appendix, most commonly resulting from obstruction of the appendiceal lumen. The obstruction may be caused by faecoliths, lymphoid hyperplasia, neoplasms, foreign bodies, or, less commonly, parasitic infestations such as *Ascaris lumbricoides*.[1–3] *Ascaris lumbricoides* is the most prevalent intestinal helminth infecting humans, with the highest burden occurring in tropical and subtropical regions where poor sanitation and inadequate personal hygiene facilitate transmission. Although many infected individuals remain asymptomatic, heavy infestations may result in a wide range of gastrointestinal and hepatobiliary complications, including intestinal obstruction, appendicitis, biliary ascariasis, cholangitis, pancreatitis, volvulus, intussusception, and, rarely, bowel perforation.[4–6]

The pathogenesis of appendicitis associated with ascariasis is thought to involve either direct obstruction of

the appendiceal lumen by the worm or secondary lymphoid hyperplasia induced by the host inflammatory response, leading to luminal obstruction and subsequent inflammation.[3,7] In contrast, intestinal perforation due to *Ascaris lumbricoides* is uncommon and is believed to result from pressure necrosis, migration through diseased bowel, or invasion of previously weakened intestinal segments.[4,8]

The simultaneous occurrence of acute appendicitis and caecal perforation caused by *Ascaris lumbricoides* is exceedingly rare and may present a diagnostic challenge because both conditions involve the ileocaecal region and produce similar clinical features. Recognition of this unusual association is important, particularly in regions where helminthic infections are endemic, as failure to identify the concomitant pathology may result in missed bowel perforation and adverse postoperative outcomes. We report the case of a 21-year-old woman with clinical features of acute appendicitis in whom emergency surgery revealed an inflamed appendix together with a pinhole caecal perforation containing an adult *Ascaris lumbricoides* worm. This case highlights the importance of meticulous intraoperative examination of the caecum and terminal ileum during appendicectomy in endemic settings to avoid overlooking associated pathology.

CASE REPORT

A 21-year-old female undergraduate presented to the Accident and Emergency Department of our institution with a five-day history of abdominal pain, vomiting, and low-grade fever. The abdominal pain was initially peri-umbilical, colicky in nature, and progressively migrated to the right iliac fossa, where it became persistent. It was aggravated by standing erect and partially relieved by lying on her right side with her knees flexed. She experienced one episode of non-projectile, non-bilious vomiting daily, consisting of recently ingested food, and had intermittent low-grade fever throughout the illness. There was no history of altered bowel habit, prior abdominal trauma, previous abdominal surgery, or passage of worms in the stool. Her last menstrual period was 2 weeks prior to presentation. No dysmenorrhea. There was no vaginal discharge, dysuria, urinary frequency or haematuria. She had taken diclofenac and unspecified antibiotics before presenting to a university health centre, from where she was referred to our institution because of persistent symptoms.

On examination, she appeared acutely ill and was in painful distress. Her abdomen was full and moved with respiration. There was a positive pointing sign over the McBurney's point, with marked tenderness, guarding, rebound tenderness, and. Rovsing's sign was positive. Digital rectal examination was unremarkable. Examination of the cardiovascular, respiratory, and other systems revealed no significant abnormalities.

Plain chest and abdominal radiographs showed no evidence of pneumoperitoneum or intestinal obstruction (Figure 1).

Figure 1: (A and B) Plain abdominal X-ray showing supine and erect views and (C) chest X-ray AP view.

Laboratory investigations demonstrated anaemia, with a haemoglobin concentration of 7.6 g/dl (haematocrit 22.9%). The total white blood cell count was 9.6 × 10⁹/l with a normal differential count, while platelet count, serum electrolytes, urea, and creatinine were within normal limits. Based on the clinical findings, a diagnosis of acute appendicitis was made, and the patient was prepared for emergency open appendicectomy.

At surgery, a copious straw-coloured peritoneal fluid was encountered. The vermiform appendix was grossly inflamed, and a pinhole perforation measuring approximately 5 mm proximal to the appendiceal base was identified on the caecum (Figure 2). An adult *Ascaris lumbricoides* worm was found protruding through the perforation, which was removed (Figure 3).

Figure 2: Demonstrating the pinhole perforation on the caecum with an artery forcep being insinuated into it.

Figure 3: The *Ascaris lumbricoides* worm being displayed.

An appendicectomy was performed, followed thorough peritoneal lavage. The edges of the caecal perforation were freshened, a biopsy specimen was obtained for histopathological examination, and the perforation was closed primarily with interruptedly with vicryl 2/0 sutures. The abdominal wall was closed in layers, with the skin approximated using 2/0 nylon in a vertical mattress fashion.

The postoperative period was uneventful. The patient received intravenous ceftriaxone and metronidazole, intravenous fluids, analgesics, and a single oral dose of albendazole (400 mg) on the third postoperative day to eradicate any residual intestinal infestation. Oral feeding was commenced on the second postoperative day, and she was discharged home on the fifth postoperative day on oral antibiotics and analgesics. Histopathological examination of both the appendiceal and caecal specimens demonstrated features of acute inflammation without evidence of malignancy. At follow-up, the surgical wound had healed satisfactorily, and the patient remained clinically well.

DISCUSSION

Acute appendicitis is one of the commonest surgical emergencies worldwide, whereas caecal perforation secondary to *Ascaris lumbricoides* infestation is exceedingly rare. The concurrent occurrence of these two pathologies in the same patient is exceptional and presents a diagnostic challenge because both conditions involve the ileocaecal region and manifest with similar clinical features. Consequently, the diagnosis is often established only at surgery, as occurred in the present case. Ascariasis remains a significant public health problem in tropical and subtropical countries where poor sanitation, inadequate access to clean water, and suboptimal hygiene facilitate transmission. Despite ongoing deworming programmes, *Ascaris lumbricoides* continues to affect millions of people globally, with the greatest burden occurring in low- and middle-income countries, particularly in sub-Saharan Africa and South Asia. Although most infections are asymptomatic, heavy worm infestation may result in serious surgical complications, including intestinal obstruction, biliary ascariasis, pancreatitis, appendicitis, volvulus, intussusception and less commonly bowel perforation.[4-6]

The mechanism by which *Ascaris lumbricoides* causes acute appendicitis remains incompletely understood. The parasite may directly obstruct the appendiceal lumen or induce lymphoid hyperplasia, resulting in luminal obstruction, bacterial overgrowth, vascular compromise and subsequent inflammation.[3,7] In contrast, intestinal perforation is an uncommon complication and has been attributed to pressure necrosis exerted by the worm, migration through diseased bowel, or perforation of previously weakened intestinal segments caused by inflammation, infection, or trauma.[4,9] Although *Ascaris lumbricoides* rarely perforates healthy bowel, the presence of an adult worm protruding through the caecal perforation in our patient strongly suggests a causal relationship.

Our patient presented with the classical clinical features of acute appendicitis, including migratory right iliac fossa pain, localized tenderness, rebound tenderness, and a positive Rovsing's sign. There were no clinical or radiographic findings suggestive of hollow viscus perforation, illustrating the difficulty of diagnosing concomitant caecal perforation preoperatively. Similarly, Wani et al reported that bowel perforation caused by *Ascaris lumbricoides* may mimic other causes of acute abdomen and is frequently recognized only during laparotomy.[9] Likewise, Molla et al described a patient with ileal perforation due to *Ascaris lumbricoides* in whom the diagnosis was established intraoperatively because the preoperative clinical picture was non-

specific.[4] These reports, together with the present case, emphasize that surgeons practicing in endemic regions should maintain a high index of suspicion for associated bowel pathology, even when the clinical diagnosis appears straightforward.

The intraoperative finding of an inflamed appendix together with a pinhole caecal perforation containing an adult *Ascaris lumbricoides* worm distinguishes this case from most previously reported cases, which have described either appendicitis or bowel perforation occurring in isolation. Rodriguez-Gomez et al reported appendicitis associated with *Ascaris lumbricoides* without intestinal perforation.[10] Similarly, Al-Subhi et al described acute appendicitis complicated by luminal ascariasis but without associated caecal injury.[11] Niag et al reported a rare case of acute appendicitis in which an adult *Ascaris lumbricoides* worm was identified within the inflamed appendix; however, unlike our patient, there was no associated caecal perforation. Conversely, Xie et al reported gastric perforation caused by *Ascaris lumbricoides*, highlighting the ability of the parasite to produce perforation at different sites within the gastrointestinal tract, although appendiceal involvement was absent.[12,13] The coexistence of both lesions in the present patient therefore represents an exceptionally uncommon presentation and reinforces the need for careful exploration of the caecum and terminal ileum whenever helminthic infestation is suspected.

The surgical management employed in this patient was consistent with current recommendations for localized caecal perforation in the presence of healthy surrounding bowel. Primary repair following debridement of the perforation edges, appendicectomy, thorough peritoneal lavage, broad-spectrum antibiotics, and postoperative anthelminthic therapy resulted in an excellent clinical outcome. Similar successful management strategies have been reported in other recent case reports involving localized bowel perforation due to *Ascaris lumbricoides*, thereby supporting primary repair as an effective option when tissue viability is preserved and generalized faecal contamination is absent.[4,9]

This case also highlights the importance of postoperative deworming in endemic settings. Administration of albendazole after surgery is recommended to eradicate residual intestinal worms and reduce the risk of recurrent infestation. Furthermore, public health measures aimed at improving sanitation, promoting hand hygiene, ensuring access to safe water, and implementing periodic community-based deworming programmes remain essential in reducing the burden of ascariasis and its associated surgical complications.[6]

Although this report describes a single patient and therefore cannot establish a causal relationship between appendicitis and caecal perforation, it contributes to the limited literature on this rare clinical entity. To the best of our knowledge, report describing the simultaneous occurrence of acute appendicitis and *Ascaris lumbricoides* induced caecal perforation are exceedingly scarce. The case therefore adds valuable evidence to the existing literature and underscores the importance of meticulous intraoperative inspection of the caecum and terminal ileum during appendicectomy in regions where helminthic infections are endemic, as failure to identify concomitant pathology may lead to missed perforation, postoperative sepsis, and increased morbidity.

CONCLUSION

The coexistence of acute appendicitis and *Ascaris lumbricoides* induced caecal perforation is an exceptionally rare but important surgical entity that may mimic uncomplicated acute appendicitis and therefore remain unrecognized until surgery. This case highlights the importance of maintaining a high index of suspicion for concomitant bowel pathology in patients from regions where helminthic infestations are endemic. Careful intraoperative inspection of the caecum and terminal ileum during appendicectomy is essential to identify associated lesions and prevent missed perforations. Prompt surgical intervention, appropriate repair of the perforation, and post-operative anti-helminthic therapy can result in excellent clinical outcomes.

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