

Beyond the Usual Suspect: Diagnostic Pitfalls and Uncommon Presentations of Acute Appendicitis – A Case Series

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Abstract

Acute appendicitis is traditionally regarded as one of the most common and straightforward indications for emergency abdominal surgery. Nevertheless, its heterogeneous clinical presentations can mimic other intra-abdominal conditions or co-occur with pathologies such as intestinal obstruction, peptic ulcer perforation, and pancreatitis. These complex presentations often present diagnostic hurdles, highlight the limitations of conventional imaging, and underscore the imperative for careful clinical acumen. We report a case series of five patients, all of whom were initially suspected to have acute appendicitis. However, their subsequent clinical course and operative findings revealed a variety of diagnostic pitfalls: caecal perforation at the base of the appendix, coexistent acute pancreatitis, retrocecal appendix obscured on ultrasound, a sealed gastric perforation masquerading as appendicitis, and acute intestinal obstruction rooted in adhesions around an inflamed appendix. Each scenario demanded a distinct management strategy, ranging from hemicolectomy and stoma formation to conservative treatment of pancreatitis and meticulous operative exploration of retrocecal anatomy. These cases exemplify the dynamic nature of acute appendicitis and call attention to the importance of a broad differential diagnosis. They further illustrate that clinical vigilance, paired with thoughtful imaging and operative nuance, is indispensable for optimizing patient outcomes.

Keywords: Acute Abdomen, Appendectomy, Clinical Vigilance, Diagnostic Pitfalls, Imaging Challenges, Perforation.

Introduction

Acute appendicitis persists as a principal cause of acute abdominal pain and is often considered a benchmark for surgical emergencies. Its incidence peaks in the second and third decades of life, driven primarily by luminal obstruction leading to bacterial overgrowth, tissue ischemia, and eventual perforation if unrecognized or untreated (1, 2). Despite a well-recognized triad of symptoms—migratory right iliac fossa (RIF) pain, nausea, and fever—atypical clinical manifestations are frequently encountered. These variations may arise from anatomic anomalies such as retrocecal or subhepatic appendices, patient comorbidities, or concomitant pathologies (3). Technological advances in diagnostic imaging have undeniably refined our ability to diagnose acute appendicitis. Ultrasound (USG) and computed tomography (CT) both demonstrate high sensitivity in typical cases, with CT often exceeding 95% (4, 5). However, complex or atypical presentations continue to challenge clinicians. For instance, cases involving

free air under the diaphragm, abnormal biochemical markers such as elevated amylase or lipase, or overshadowing signs of peritonitis can cause significant diagnostic ambiguity (6, 7). Additionally, retrocecal or pelvic appendices may evade detection on ultrasound due to their anatomical location, necessitating greater reliance on cross-sectional imaging modalities. Such diagnostic hurdles highlight the need for careful clinical acumen, particularly in resource-limited settings where advanced imaging may not always be readily available. Although the diagnosis and management of typical acute appendicitis are well-documented, the literature addressing the challenges posed by atypical or coexistent presentations remains limited. These scenarios often require a broader differential diagnosis and a tailored management approach. Conditions mimicking or complicating appendicitis, such as intestinal obstruction, pancreatitis, or perforated peptic ulcers, can further obscure clinical

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judgment and complicate decision-making. The present series describes five such patients whose initial presentations suggested appendicitis but ultimately demanded more intricate clinical and surgical discernment to achieve definitive management. By documenting these cases, we aim to highlight the diagnostic pitfalls associated with atypical presentations of acute appendicitis and underscore the importance of a nuanced approach. This case series not only contributes to the existing body of knowledge but also emphasizes the value of maintaining a broad diagnostic perspective in the evaluation of acute abdominal pain.

Methodology

This case series includes five consecutive patients who presented with diagnostic dilemmas related to suspected acute appendicitis. Cases were selected based on atypical clinical presentations or intraoperative findings that diverged from the initial diagnosis of appendicitis. Comprehensive

documentation of each case was undertaken, including clinical, imaging, and operative details, to elucidate the challenges in diagnosis and management. All patient data were anonymized to maintain confidentiality.

Case Presentations

Case 1 involved an 18-year-old managed conservatively for an “appendicular lump” who deteriorated clinically, with imaging revealing free air under the diaphragm. Exploratory surgery identified a caecal perforation at the inflamed appendiceal base, necessitating limited colectomy and stoma formation. Table 1 details the patient’s presenting symptoms and initial diagnosis, while Figure 1(a) illustrates the caecal perforation observed intraoperatively. Three months follow-up revealed satisfactory stoma function with no evidence of recurrence or additional complications and is planned for reversal of stoma after 6 months.

Table 1: Demographics and Presentation of Individual Patients

Patient	Age/Sex	Presenting Symptoms	Initial Diagnosis
1	18/M	Acute abdomen, deterioration after conservative treatment for appendicular lump	Appendicular Lump
2	28/M	RIF pain, diffuse abdominal pain, vomiting	Acute appendicitis
3	23/F	RIF pain, nausea, probe tenderness but appendix not visualised on USG	? Acute appendicitis
4	46/F	RIF pain, nausea, vomiting, fever, distended abdomen	Suspected appendicular perforation
5	17/M	Diffuse abdominal pain, distension, imaging suggestive of small bowel obstruction	Intestinal obstruction

In Case 2, a 28-year-old presented with persistent postoperative discomfort following an appendectomy; elevated serum amylase and lipase clarified conservatively. This patient’s presenting symptoms and management decisions are summarized in Table 2, and follow-up imaging confirmed resolution of pancreatitis without complications. The patient remained symptom-free on follow-up for six months, demonstrating effective resolution of pancreatitis with no recurrence.

Case 3 concerned a 23-year-old with RIF pain but an unvisualized appendix on ultrasound; careful surgical exploration disclosed a 16-cm retrocecal appendix. Figure 1(b) and (c) highlight the anatomical challenges encountered in this case, including the mobilization of the cecum and the unusually long appendix. Follow-up at 1 month

indicated no residual symptoms or complications, supporting the efficacy of careful mobilization in challenging anatomical variants.

Case 4 demonstrated that free air under the diaphragm can occasionally stem from a gastric antral perforation partially sealed by omentum, erroneously suggesting appendicular perforation. The imaging finding for this case, including free air, are shown in Figure 2(a), which guided the intraoperative discovery and subsequent repair. This patient experienced no postoperative complications, and 3 month follow-up revealed complete resolution of symptoms. Finally, Case 5 underscored the potential for significant small-bowel obstruction triggered by adhesions around an inflamed appendix, prompting a more extensive resection and stoma creation. Figure 2(b) depicts the fascial dehiscence encountered

postoperatively, while Table 2 outlines the patient's management and recovery. At the three-month follow-up, the patient demonstrated a good recovery despite initial fascial dehiscence;

however, an incisional hernia was noted. A hernioplasty is planned after an additional three months to ensure complete recovery.

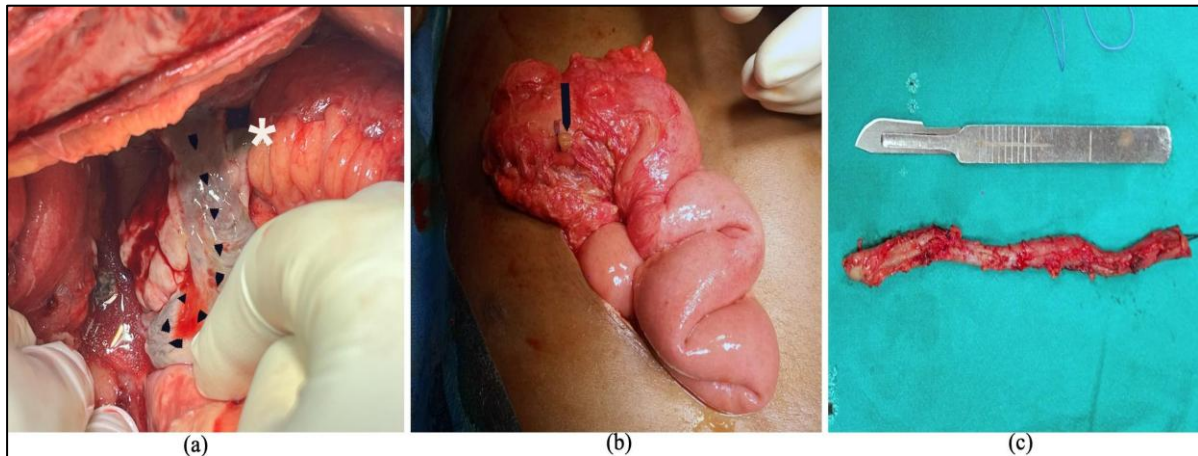


Figure 1: Panel (a) Shows Patient 1 [Diagnosed as Appendicular Base Perforation] with Perforation at Appendix (Denoted by Interrupted Line) Base (Marked by Asterisk)[Limited Colectomy was Performed, Panel (b) Shows Patient 3 [Intraoperative Diagnosis of Retrocaecal Appendix] with Cecum Delivered via Appendectomy Incision After Mobilization (Ligated Appendix Base Marked by Pointer), Panel (c) Shows 18 Cm Long Appendix of the Same Patient

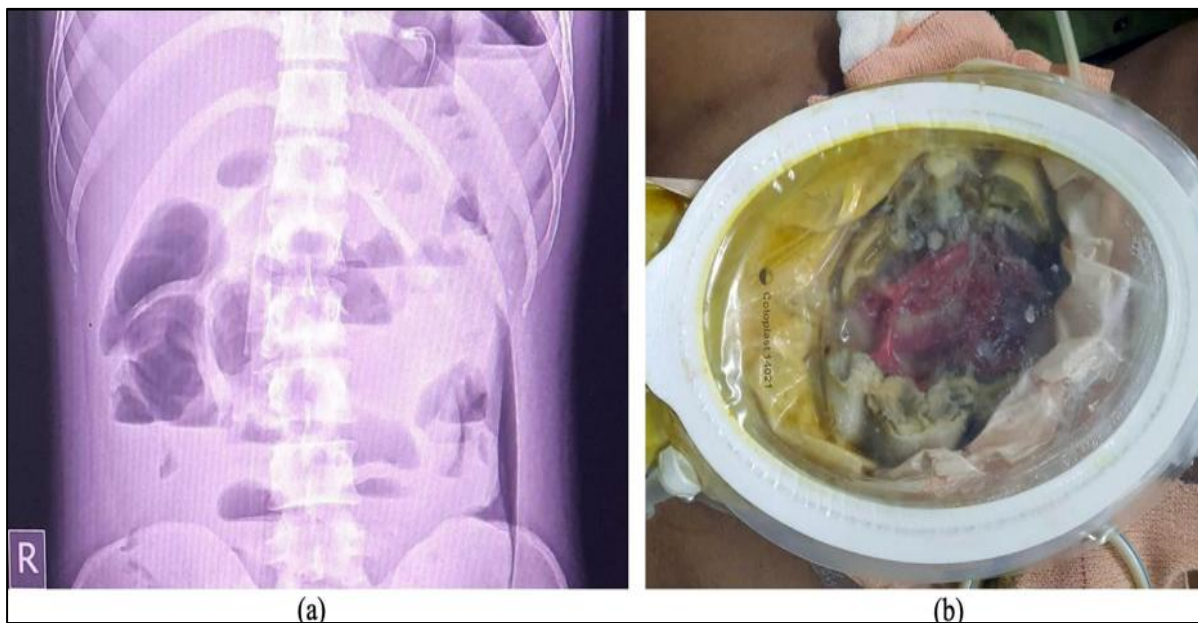


Figure 2: Panel (a) Shows Erect X-Ray Abdomen of Patient 4 Showing Free Air in the Abdomen, Panel (b) Shows Patient 5 Post-Dehiscence of Fascial Sheath with Healthy Granulation Tissue

Table 2: Diagnosis, Management, and Outcomes

Patient	Diagnostic Dilemma	Management	Outcome
1	Initially presumed appendicular lump; discovered perforation later	Right colectomy with ileocolic stoma	Discharged in stable state after 1 week
2	Persistent postoperative pain; acute pancreatitis rather than recurrence of appendicitis	Conservative management for pancreatitis	Recovered and discharged after 5 days
3	Retrocecal appendix, not visualized on initial imaging	Appendectomy following careful mobilization of the cecum	Discharged in stable state after 3 days
4	Suspected perforated appendicitis; unexpectedly identified gastric perforation	Modified Graham's patch repair	Discharged in stable state after 5 days
5	Adhesive intestinal obstruction secondary to inflamed appendix	Appendectomy, enterectomy, double-barrel stoma creation	Postoperative fascial dehiscence managed conservatively; stable on discharge

Discussion

Despite its reputation as a straightforward diagnosis, acute appendicitis remains a condition in which clinical ambiguity can arise from anatomic variations, radiological challenges, and overlapping symptom profiles with other intra-abdominal ailments. Misdiagnosis rates of acute appendicitis can exceed 20% in atypical presentations, underscoring the limitations of relying solely on classical symptoms or a single imaging modality (8, 9). These five cases collectively epitomize the intricate decisions required when standard clinical heuristics fail, adding to the growing body of literature that challenges a purely algorithmic approach to appendicitis diagnosis.

The first patient's trajectory reveals how conservative management of an appendicular lump may mask a worsening pathological state. Current evidence suggests that a subset of patients initially treated nonoperatively may nevertheless proceed to perforation or intra-abdominal abscess formation if the inflammatory process persists (10). This aligns with studies emphasizing the importance of early intervention in cases of clinical deterioration, highlighting that nonoperative management is not without its risks. Consequently, these findings support the broader call for close monitoring, repeat imaging, and a lower threshold for surgical intervention in equivocal cases.

The interplay between pancreatitis and appendicitis, as demonstrated in the second case, represents a relatively rare but clinically significant diagnostic challenge. Elevated serum amylase and lipase in a postoperative patient should prompt reconsideration of the differential diagnosis to prevent unwarranted surgical re-exploration (11). This case exemplifies the principle that new or persistent symptoms after an index operation cannot always be attributed to a technical failure of the initial procedure, reinforcing findings from prior literature that advocate for a systematic evaluation of persistent postoperative symptoms to avoid unnecessary interventions.

A retrocecal appendix, as seen in the third patient, complicates both physical examination and ultrasonographic visibility. Reported in 26–65% of cases, this anatomical variant often causes atypical pain localization and can prolong diagnostic times unless clinicians maintain a high index of suspicion (12). While computed tomography is recognized as the gold standard in such scenarios due to its superior diagnostic capabilities, this case underscores the need for heightened awareness of retrocecal anatomy and its implications in clinical practice. This aligns with broader discussions in the literature regarding the role of advanced imaging in reducing diagnostic delays for atypical

presentations.

Equally instructive is the fourth case, in which free air under the diaphragm led to an intraoperative discovery of a perforated gastric antrum rather than an appendicular perforation. Sealed perforations of the stomach or duodenum have been documented to mimic appendicitis due to localized inflammatory signs in the RIF (13). This finding adds to the existing literature by illustrating that when imaging findings indicate pneumoperitoneum, surgeons must extend their diagnostic considerations beyond the lower gastrointestinal tract to include more proximal sources of perforation, particularly in cases with atypical clinical findings.

Finally, appendicitis can itself incite complications such as adhesive small-bowel obstruction. The fifth patient required not only appendectomy but also an enterectomy and stoma formation because of a strictured loop of ileum. Although less frequently reported, this scenario reinforces prior observations that ongoing inflammation around the appendix can produce significant adhesions, culminating in mechanical obstruction (14). This case emphasizes the importance of early identification and management of appendicitis-related complications to minimize long-term morbidity.

Taken together, these cases underscore that accurate identification of acute appendicitis necessitates a multimodal approach integrating clinical evaluation, imaging, laboratory indices, and operative judgment. They also challenge the traditional perception of appendicitis as a straightforward diagnosis, highlighting the need for clinicians to remain vigilant for coexisting pathologies. By connecting these findings to broader discussions in the literature, this case series reinforces the value of an adaptable and nuanced approach to managing atypical or complex presentations of acute appendicitis.

Conclusion

This case series illuminates the multifaceted presentations of acute appendicitis, emphasizing that even a quintessential surgical emergency may be subject to a gamut of diagnostic complexities. Clinicians must be vigilant in recognizing atypical presentations and adaptable in tailoring their diagnostic and therapeutic strategies to individual patient scenarios. Incorporating multimodal diagnostic approaches, informed by clinical

judgment and advanced imaging techniques, is crucial in navigating these challenges.

Key Lessons Learned

Maintain Diagnostic Flexibility

Ongoing clinical reassessments and repeat imaging are critical when patients deviate from expected courses.

Prioritize Advanced Investigations

Complementary imaging and biochemical studies can refine the differential diagnosis, although none is foolproof.

Recognize Anatomical Variations

Retrocecal or anomalously positioned appendices frequently complicate standard diagnostic algorithms.

Adapt Surgical Strategies

Surgeons must be prepared to shift from simple appendectomy to more extensive resections or stoma formation when complications, such as caecal perforation or bowel adhesions, are encountered.

Anticipate Overlapping Pathologies

Coexistent conditions like pancreatitis, peptic ulcer perforation, or adhesive obstruction may masquerade as appendicitis or compound its clinical presentation.

Implement Multidisciplinary Collaboration

In complex or uncertain cases, timely input from radiologists, gastroenterologists, and critical care specialists can guide decision-making and improve outcomes.

Optimize Follow-Up and Postoperative Care

Clear communication with patients regarding warning signs and the potential for overlapping or recurrent conditions is essential for ensuring favorable recovery trajectories.

By integrating clinical judgment with evolving diagnostic modalities, a more accurate recognition of acute appendicitis—including its atypical variants—can be achieved, mitigating the risk of misdiagnosis and optimizing surgical management. This approach not only improves outcomes in individual cases but also contributes to refining clinical pathways for diagnosing and managing acute abdominal emergencies.

Abbreviations

RIF: Right Iliac Fossa, USG: Ultrasound, CT: Computed Tomography.

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Author Contributions

All authors contributed equally.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

Ethics Approval

All patients provided informed consent before participating in the study.

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