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Diverse Presentations of Appendicitis: A Clinical Perspective

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Abstract

Background: Acute appendicitis is among the most frequent surgical emergencies encountered worldwide and remains a predominantly clinical diagnosis supported by laboratory and imaging findings. Although the classical presentation of migratory right iliac fossa pain with anorexia, nausea, and localized tenderness is well recognized, a considerable proportion of patients present atypically. Variations in appendicular position, extremes of age, and underlying neoplastic disease of the appendix may all alter the clinical picture and delay definitive management. **Case Series:** We report three patients managed at a tertiary care teaching hospital who illustrate the breadth of this spectrum. The first, a 51-year-old male with a short history of right lower quadrant pain, was found on ultrasonography to have an appendicular mucocele; histopathology after laparoscopic appendectomy revealed a low-grade appendiceal mucinous neoplasm, and he underwent completion right hemicolectomy. The second, a 13-year-old girl, presented with generalized peritonitis secondary to a perforated appendix with an appendicolith and required emergency exploratory laparotomy with appendectomy. The third, a 54-year-old male, presented with lower abdominal pain radiating to the back accompanied by loose stools, mimicking a colonic or urological cause, and was managed by emergency open appendectomy. **Conclusion:** These cases demonstrate that appendicitis may present as uncomplicated inflammation, as established perforation with peritonitis, or as an incidentally detected neoplastic lesion. A structured approach combining careful history, clinical examination, appropriate imaging, and mandatory histopathological examination of every appendectomy specimen is essential to avoid missed diagnoses and to guide further management.

Keywords: Appendectomy, Appendiceal neoplasms, Appendicitis, Low-grade appendiceal mucinous neoplasm, Mucocele, Perforated appendix

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Introduction

Appendicitis is an inflammatory condition of the vermiform appendix and constitutes one of the most common indications for emergency abdominal surgery in India and worldwide.[1] Most patients present within the first 24–48 h of the onset of symptoms. Despite growing interest in primary antibiotic therapy for selected uncomplicated cases, appendectomy remains the definitive treatment for the majority of patients.[2] When diagnosis or treatment is delayed, patients are exposed to the risk of perforation, appendicular abscess, generalized peritonitis, sepsis, and occasionally, death. Paradoxically, a perforation that becomes walled off by omentum and adjacent bowel may produce a more indolent and less alarming clinical picture than uncomplicated inflammation, which can further mislead the clinician.[3]

The underlying mechanism in most cases is obstruction of the appendicular lumen by a fecolith, lymphoid hyperplasia, an intestinal parasite or, less commonly, an appendicular tumor. Luminal obstruction raises both intraluminal and intramural pressure, producing small-vessel occlusion, venous thrombosis and lymphatic stasis. The obstructed appendix distends with mucus, and progressive vascular compromise leads to mural ischemia and necrosis. Bacterial overgrowth accompanies this process, with aerobic organisms predominating early and a mixed aerobic and anaerobic flora appearing as the disease advances; *Escherichia coli*, *Peptostreptococcus* species, *Bacteroides* species, and *Pseudomonas* species are the organisms most often isolated.[1,3]

The typical presentation in adults comprises periumbilical pain migrating to the right iliac fossa, anorexia, nausea with or without vomiting, low-grade fever, and localized guarding or rigidity. Atypical presentations include pelvic pain, back pain, diarrhea or constipation-like symptoms, and urinary complaints, and are particularly common when the appendix lies in a retrocecal, pelvic, or subhepatic position. Scoring systems such as the Alvarado score have been developed to stratify risk and reduce negative appendectomy rates, and perform best as a tool to exclude rather than to confirm the diagnosis.[4] Ultrasonography is generally employed as the first-line investigation, with computed tomography reserved for equivocal presentations.[2]

Primary tumors of the appendix are uncommon, being identified in fewer than 2% of appendectomy specimens, yet they carry disproportionate clinical significance. Appendiceal mucinous neoplasms form a distinct group of epithelial tumors characterized by cystic dilatation of the appendix due to intraluminal accumulation of mucin, clinically referred to as a mucocele. These lesions range from benign retention cysts to invasive mucinous adenocarcinoma, and rupture with intraperitoneal spillage of neoplastic epithelium may result in pseudomyxoma peritonei.[5-8] Because such lesions are frequently indistinguishable from ordinary appendicitis before operation, histopathological examination of every appendectomy specimen remains mandatory.[9]

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Case Presentations

Case 1: Appendicular Mucocele Harboring a Low-grade Appendiceal Mucinous Neoplasm

A 51-year-old male presented to the emergency department with a 2-day history of pain in the right lower abdomen. The pain was sudden in onset, sharp, and colicky in character. He also reported multiple episodes of vomiting over the preceding day, the vomitus containing food particles. There was no history of fever or anorexia. He had undergone no previous abdominal surgery and had no known comorbid illness.

On examination, he was afebrile and hemodynamically stable. The abdomen was soft, with localized tenderness at McBurney's point and no guarding, rigidity, or palpable mass. Bowel sounds were normal.

Routine hematological and biochemical investigations were performed. Ultrasonography of the abdomen confirmed features consistent with acute appendicitis and additionally reported a mucocele of the appendix. The patient was taken for laparoscopic appendectomy (Figure 1).

Histopathological examination of the specimen established a diagnosis of low-grade appendiceal mucinous neoplasm. In view of this finding, the patient was counseled and subsequently underwent right hemicolectomy. His post-operative recovery was uneventful.

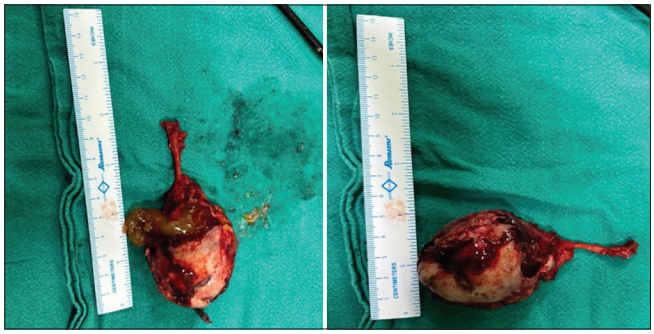

Figure 1: Resected appendix specimen in Case 1, demonstrating a bulbous, distended distal appendix with extruded gelatinous mucinous material, consistent with an appendicular mucocele

Case 2: Perforated Appendicitis with Generalized Peritonitis in an Adolescent

A 13-year-old girl was brought to the emergency department with severe generalized abdominal pain of 2 days' duration, multiple episodes of vomiting for 1 day, and multiple episodes of high-grade fever over the preceding 2 days.

On examination she was febrile, with a recorded temperature of 101°F. The abdomen was distended, with generalized tenderness and guarding. Bowel sounds were diminished.

Ultrasonography of the abdomen demonstrated inter-bowel free fluid together with a perforated appendix containing an appendicolith. In view of the clinical picture of generalized peritonitis, the patient was taken up for emergency exploratory laparotomy with appendectomy.

Intraoperative findings confirmed a perforated appendix with an appendicolith and localized purulent collection (Figure 2). Appendectomy was performed with thorough peritoneal lavage and drainage.

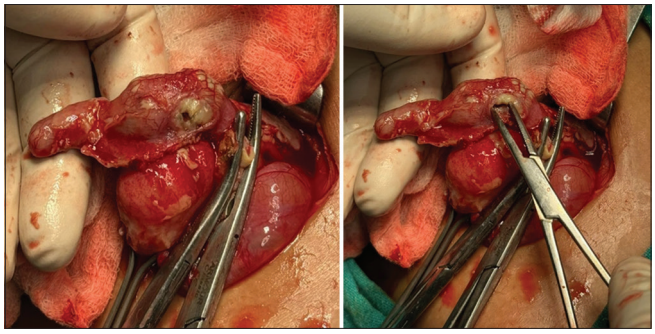

Figure 2: Intraoperative photographs in Case 2, showing an inflamed, perforated appendix with an impacted appendicolith visible at the site of perforation, together with surrounding inflammatory exudate and edematous adjacent bowel

Case 3: Appendicitis Presenting with Back Pain and Diarrhea

A 54-year-old male presented to the emergency department complaining of pain in the lower abdomen for 3 days, radiating to the back. He also gave a history of four to five episodes of loose stools over 2 days, nausea for 1 day, and a single episode of fever associated with chills.

On examination, the patient was afebrile. The abdomen was soft, with tenderness localized to the right iliac fossa. There was no guarding, rigidity or palpable lump.

Ultrasonography of the abdomen revealed minimal free fluid in the right iliac fossa with surrounding inflammatory changes around the appendix and associated mesenteric lymphadenopathy. The patient was taken up for emergency open appendectomy.

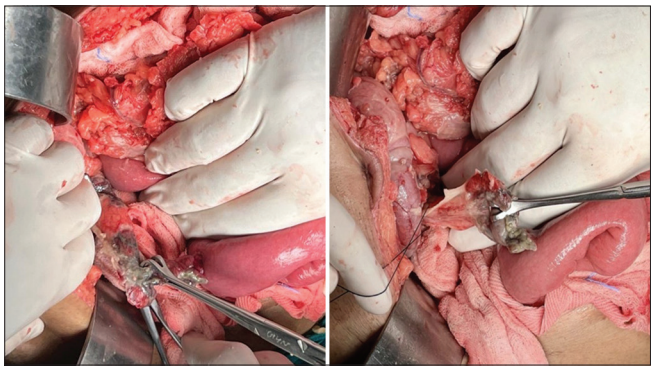

Figure 3: Intraoperative photographs in Case 3, showing delivery of the inflamed appendix through a right iliac fossa incision, with surrounding inflammatory change and adherent omentum

The appendix was congested and inflamed with surrounding inflammatory adhesions (Figure 3). Appendectomy was completed, and the specimen was sent for histopathological examination. The post-operative course was uneventful.

Discussion

The three patients described above illustrate that appendicitis

is best regarded not as a single clinical entity but as a spectrum. It may present as simple acute inflammation, as established perforation with generalized peritonitis, or as an incidentally detected neoplastic lesion of the appendix. Each of these requires urgent recognition, but the management pathway that follows differs substantially.

Atypical presentations are encountered more frequently at the extremes of age, in pregnancy, and in patients with underlying malignancy, in whom physiological changes and symptom masking may obscure the classical picture. Case 3 in the present series demonstrates this well: lower abdominal pain radiating to the back, accompanied by loose stools, would ordinarily direct attention toward a colonic, urological, or musculoskeletal cause, and the correct diagnosis was reached only through the combination of focused clinical examination and imaging. Laboratory findings alone are neither sufficiently sensitive nor sufficiently specific to be relied upon, and imaging should always be interpreted alongside clinical assessment rather than in isolation.[2,4]

Perforation carries substantial morbidity, particularly in children and adolescents, in whom diagnosis is more often delayed because of difficulty in localizing pain and a lower threshold for attributing symptoms to gastroenteritis. Case 2 presented after 2 days of generalized pain with established peritonitis, and required laparotomy rather than a limited appendicular incision. An impacted appendicolith, as seen in this patient, is a recognized risk factor for both perforation and failure of non-operative management, and its presence on imaging should prompt a lower threshold for early operative intervention.[3]

Case 1 highlights the most important lesson of this series. A mucocele identified on pre-operative ultrasonography should always raise the possibility of an underlying mucinous neoplasm. Low-grade appendiceal mucinous neoplasms are confined to the appendix in the majority of cases, and when the lesion is intact, the margin is uninvolved, and there is no acellular or cellular mucin beyond the appendix, appendectomy alone may be adequate.[6,9] Where the lesion has ruptured, where mucin is present within the peritoneal cavity, or where the base or margin is involved, more extensive surgery is required, and cytoreductive surgery with hyperthermic intraperitoneal chemotherapy is the accepted approach for established pseudomyxoma peritonei.[7,10] Because these lesions are rarely diagnosed with certainty before operation, histopathological examination of every appendectomy specimen is not a formality but a clinical necessity, as underscored by reported cases of mucinous appendiceal neoplasm diagnosed only postoperatively.[11] Where invasive adenocarcinoma with peritoneal metastasis is identified, management is best guided by protocols from dedicated case series.[12]

Taken together, this series underscores the value of a structured diagnostic approach in a condition that surgeons encounter daily and may therefore be tempted to treat as routine. Careful history and examination, judicious use of imaging, appropriate choice of operative approach, and mandatory histopathology of the specimen together minimize the risk of both missed diagnosis and missed neoplasm.

Conclusion

The diverse presentations of appendicitis reinforce the importance of thorough clinical evaluation supported, where necessary, by appropriate imaging. Recognizing the range of ways in which appendicitis can present, from uncomplicated inflammation through frank perforation to occult neoplasia, allows timely and appropriate treatment, reduces the risk of complications, and improves patient outcomes. Histopathological examination of every appendectomy specimen should be regarded as an essential and non-negotiable component of management.

Informed Consent

Written informed consent was obtained from the patients and from the parent or legal guardian in the case of the minor patient for the use of clinical details and intraoperative photographs for academic publication. All identifying information has been removed.

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