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Case report

Mechanical Small Bowel Obstruction Secondary to Acute Appendicitis: A Case Report and Review of the Literature.

Occlusion mécanique de l'intestin grêle secondaire à une appendicite aiguë : à propos d'un cas et revue de la littérature.

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Résumé

Introduction : L'appendicite aiguë et l'occlusion de l'intestin grêle figurent parmi les causes les plus fréquentes d'abdomen aigu nécessitant une intervention chirurgicale. Cependant, l'occlusion mécanique de l'intestin grêle secondaire à une appendicite aiguë constitue une entité clinique rare, susceptible de masquer la présentation classique de l'appendicite et d'entraîner un retard diagnostique.

Présentation du cas : Nous rapportons le cas d'un patient de 18 ans, présentant depuis quatre jours des douleurs abdominales d'intensité progressive, une dysurie, des nausées, une anorexie et une fièvre intermittente, suivies de vomissements, d'une distension abdominale et de signes évocateurs d'une occlusion intestinale.

Les examens biologiques ont révélé une élévation importante de la protéine C-réactive (CRP), malgré une numération leucocytaire normale. La radiographie de l'abdomen sans préparation a montré plusieurs niveaux hydroaériques compatibles avec une occlusion de l'intestin grêle.

La tomodensitométrie abdominale avec injection de produit de contraste a mis en évidence un appendice inflammatoire, mesurant 12 mm de diamètre, contenant un appendicolithe, associé à une infiltration de la graisse périappendiculaire et à une collection liquidienne localisée. Ces résultats étaient en faveur d'une appendicite aiguë compliquée d'une occlusion intestinale mécanique. Le patient a bénéficié d'une appendicectomie laparoscopique avec drainage d'un abcès appendiculaire, permettant la résolution de l'occlusion. L'examen anatomopathologique a confirmé une appendicite aiguë suppurée avec des remaniements gangréneux. Les suites postopératoires ont été simples.

Conclusion : L'occlusion mécanique de l'intestin grêle secondaire à une appendicite aiguë est une complication rare, mais cliniquement importante, susceptible de masquer la présentation typique de l'appendicite. Une reconnaissance précoce et le recours à une imagerie appropriée sont essentiels pour établir rapidement le diagnostic et instaurer une prise en charge chirurgicale adaptée, permettant d'obtenir une évolution favorable.

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Mots clés : Appendicite aiguë, occlusion de l'intestin grêle, occlusion intestinale mécanique, abdomen aigu, appendicectomie laparoscopique.

Abstract

Background: Acute appendicitis and small bowel obstruction are among the most common causes of acute abdomen requiring surgical intervention. However, mechanical small bowel obstruction secondary to acute appendicitis is a rare clinical entity that may obscure the classical presentation of appendicitis and lead to diagnostic delay.

Case presentation: We report the case of an 18-year-old male who presented with a four-day history of progressive abdominal pain, dysuria, nausea, anorexia, and intermittent fever, followed by vomiting, abdominal distension, and features suggestive of intestinal obstruction. Laboratory investigations demonstrated markedly elevated C-reactive protein levels despite a normal white blood cell count. Plain abdominal radiography showed multiple air-fluid levels consistent with small bowel obstruction. Contrast-enhanced computed tomography revealed an inflamed appendix measuring 12 mm in diameter with an appendicolith, periappendiceal fat stranding, and focal fluid collection, indicating acute appendicitis complicated by mechanical intestinal obstruction. The patient underwent a laparoscopic appendectomy with drainage of an appendicular abscess, resulting in resolution of the obstruction. Histopathological examination confirmed acute suppurative

appendicitis with gangrenous changes. The postoperative course was uneventful.

Conclusion: Mechanical small bowel obstruction secondary to acute appendicitis is an uncommon but clinically significant condition that may mask the typical presentation of appendicitis. Early recognition and appropriate imaging are essential for timely diagnosis and surgical management, which are associated with favorable outcomes.

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Keywords: Acute appendicitis, Small bowel obstruction, Mechanical intestinal obstruction, Acute abdomen, Laparoscopic appendectomy

Introduction

Acute appendicitis is one of the most common causes of acute abdomen requiring emergency surgical intervention [1,2], while intestinal obstruction remains a leading cause of surgical admissions worldwide [3-5]. Paralytic ileus is a well-recognized accompaniment of intra-abdominal inflammation, including appendicitis. In contrast, mechanical intestinal obstruction secondary to acute appendicitis is an uncommon and potentially life-threatening condition. The association between acute appendicitis and mechanical small bowel obstruction was first described by Hotchkiss in 1901 [6]. Since then, only a limited number of cases have been reported in the literature. In such presentations, symptoms of bowel obstruction may predominate and obscure the classical clinical features of appendicitis, leading to diagnostic delay and increased risk of complications. We report a rare case of acute appendicitis complicated by mechanical intestinal obstruction in a young adult male, aiming to highlight this unusual presentation and to review the relevant literature with emphasis

on diagnostic challenges and surgical management.

Case Presentation

An 18-year-old male presented to the emergency department with a four-day history of progressive lower abdominal pain, initially associated with dysuria, followed by nausea, anorexia, and intermittent fever. One day prior to admission, his symptoms worsened with the onset of repeated vomiting, abdominal bloating, and progressive abdominal distension. He had sought medical care at multiple facilities, where he was initially managed as a case of food poisoning, without clinical improvement. The patient had no significant past medical history apart from eczema. He was not taking any regular medications and denied smoking or alcohol consumption. On physical examination, he appeared uncomfortable. Abdominal examination revealed distension with tenderness localized predominantly to the right iliac fossa, accompanied by rebound tenderness. Bowel sounds were reduced.

Laboratory investigations demonstrated a normal total white blood cell count; however, inflammatory markers were markedly elevated, with a C-reactive protein level of 305 mg/L.

Other routine laboratory parameters were unremarkable. Plain abdominal radiography (erect and supine views) showed multiple air–fluid levels, consistent with small-bowel obstruction (Figure 1.1 & Figure 1.2). Abdominal ultrasonography revealed dilated bowel loops without free intra-abdominal fluid (Figure 02). Contrast-enhanced computed tomography (CT) of the abdomen and pelvis demonstrated a distended and inflamed appendix measuring approximately 12 mm in diameter, containing an intraluminal appendicolith, with surrounding fat stranding and a focal periappendiceal fluid collection (Figure 3.1 & Figure 3.2). These findings were consistent with acute appendicitis complicated by mechanical intestinal obstruction.



Figure 1.1: Abdomen X-ray Supine showing multiple air-fluid levels and enlarged bowel loops mainly in the left side of the abdomen suggesting intestinal obstruction, likely small bowel obstruction.

The patient was admitted and underwent urgent laparoscopic exploration. Intraoperatively, a gangrenous appendix with associated abscess formation was identified, causing mechanical obstruction of adjacent small bowel loops (Figure 4.1-4.6). Laparoscopic appendectomy with drainage of the abscess was performed, resulting in relief of the obstruction. Histopathological examination of the resected specimen confirmed acute suppurative appendicitis with gangrenous changes and abscess formation (Figure 5.1-5.3). The postoperative course was uneventful, with gradual resolution of abdominal distension and restoration of normal bowel function. The patient was discharged in good condition and remained asymptomatic on follow-up.



Figure 1.2: Abdomen X-ray Standing showing multiple air-fluid levels and enlarged bowel loops mainly in the left side of the abdomen suggesting intestinal obstruction, likely small bowel obstruction.

Discussion

Acute appendicitis is one of the most common causes of acute abdomen requiring surgical intervention, with a lifetime risk estimated at approximately 7–8% [7]. In contrast, small bowel obstruction (SBO) is most frequently caused by postoperative adhesions, hernias, and malignancy, while inflammatory causes are considerably less common [3]. Mechanical intestinal obstruction secondary to acute appendicitis represents a rare clinical entity despite the high prevalence of appendicitis itself [8,9]. The coexistence of these two conditions may pose a diagnostic challenge, as obstructive symptoms can predominate, masking the classical presentation of appendicitis [8, 9, 11].

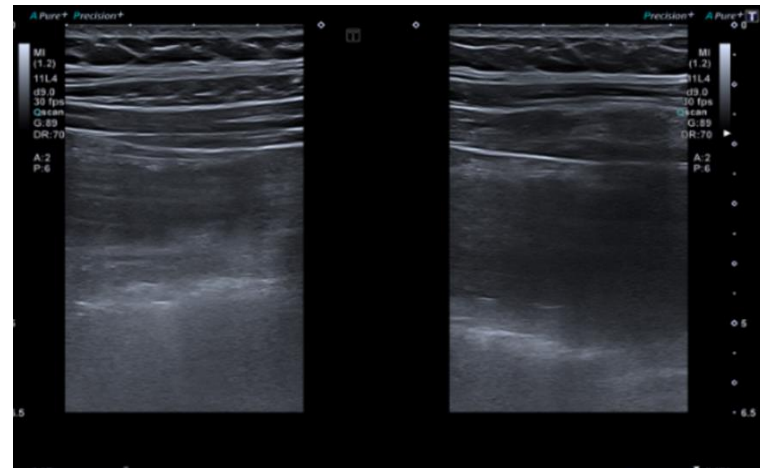


Figure 02: US Abdomen showing dilated and thickened small bowel loops.

Intestinal obstruction associated with appendicitis can be broadly classified as functional (paralytic ileus) or mechanical. Functional obstruction results from a local inflammatory response that affects adjacent bowel motility, whereas mechanical obstruction results from a structural interaction between the inflamed appendix and bowel loops [8]. Mechanical obstruction is less common but potentially more serious, as delayed treatment may lead to bowel ischemia, strangulation, or perforation [3]. Several mechanisms have been described in the literature, including appendiceal inflammatory adhesions to the small bowel, appendiceal tip attachment forming a constricting band, torsion or kinking of bowel loops, and closed-loop obstruction caused by an appendiceal knot or appendico-ileal band [8, 9-10]. In some cases, periappendiceal abscess or phlegmon may externally compress adjacent bowel loops, contributing to luminal narrowing and obstruction [11].

The rarity of appendicitis-induced mechanical SBO has been highlighted in several studies. A systematic review

reported that most cases involved mechanical obstruction rather than paralytic ileus, underscoring the importance of considering structural causes when obstruction coexists with intra-abdominal inflammation [8]. Similarly, literature reviews and case reports have demonstrated that most published data consist of isolated cases, underscoring the uncommon nature of this presentation [9-11,12]. Appendicular band syndrome and appendiceal knot formation represent particularly rare mechanisms in which the inflamed appendix encircles bowel loops, potentially producing closed-loop obstruction and increasing the risk of ischemia if not promptly treated [10].

Diagnosis of mechanical SBO secondary to appendicitis can be challenging because the clinical presentation may initially resemble primary bowel obstruction rather than appendicitis. Patients commonly present with abdominal distension, vomiting, and obstipation, while typical features such as localized right iliac fossa pain may be subtle or delayed [9-11]. Laboratory findings may also be variable. Although leukocytosis is frequently associated with appendicitis, normal white blood cell counts do not exclude significant appendiceal inflammation, as demonstrated in previously reported cases [13]. In the present case, the patient exhibited a normal leukocyte count but markedly elevated C-reactive protein levels, reflecting a significant inflammatory response despite the absence of leukocytosis.



Figure 3.1: Multi-slice CT scan of the abdomen and pelvis coronal with I V contrast injection. The appendix appears distended (12 mm diameter) in cross section, elongated and thick, enhanced wall and thickened cecal base, intraluminal appendicolith, fat strands was seen around the appendix, mild peri-focal fluid collection could be seen.

Imaging plays a central role in diagnosis. Plain abdominal radiography may demonstrate multiple air-fluid levels suggestive of bowel obstruction, but typically does not identify the underlying etiology [14]. Computed tomography (CT) remains the imaging modality of choice, as it allows visualization of the transition point, identification of inflammatory changes, and detection of complications such as abscess or perforation [3]. Several case reports have emphasized the value of CT imaging in detecting appendiceal inflammation associated with obstruction, facilitating timely surgical intervention [11-13].

In our case, CT findings of a distended appendix with appendicolith, periappendiceal fat stranding, and focal fluid collection were consistent with obstructive appendicitis and guided operative management.



Figure 3.2: Multi-slice CT scan of the abdomen and pelvis coronal with IV contrast injection. The appendix appears distended (12 mm diameter) in cross section, elongated and thick, enhanced wall and thickened cecal base, intraluminal appendicolith, fat strands was seen around the appendix, mild peri-focal fluid collection could be seen.

Surgical exploration remains the definitive diagnostic and therapeutic approach in cases where mechanical obstruction is suspected. Most reported patients are successfully treated with appendectomy and release of the obstructing band or adhesion, with favorable postoperative outcomes [9-11]. Early intervention is essential to prevent complications such as bowel ischemia or perforation, particularly in cases involving closed-loop obstruction [10]. In the present case, laparoscopic

appendectomy with drainage of the associated abscess resulted in complete resolution of symptoms and an uneventful recovery, consistent with previously reported outcomes.

This case highlights the importance of considering acute appendicitis as a rare but significant cause of mechanical intestinal obstruction, particularly in patients presenting with overlapping clinical features. Recognition of this uncommon association may facilitate earlier diagnosis and appropriate surgical management, thereby reducing the risk of complications and improving patient outcomes.





Figure 4.1-4.5: Intraoperative view showing dilated small bowel loops.

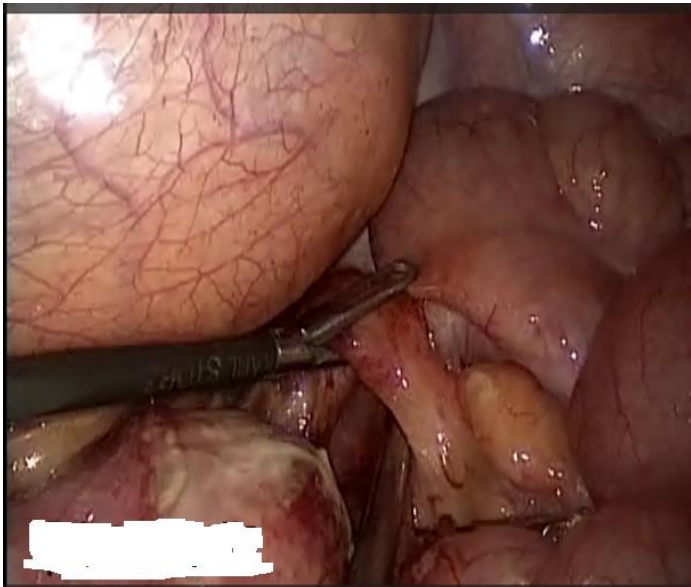


Figure 4.6: Intraoperative view showing appendix and small bowel after release of adhesions

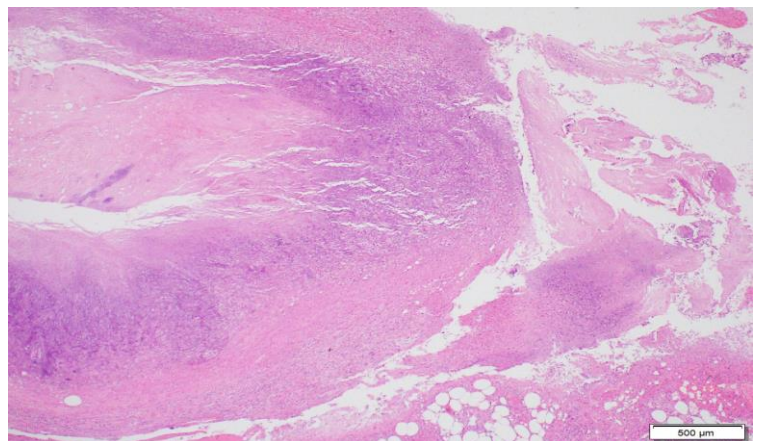
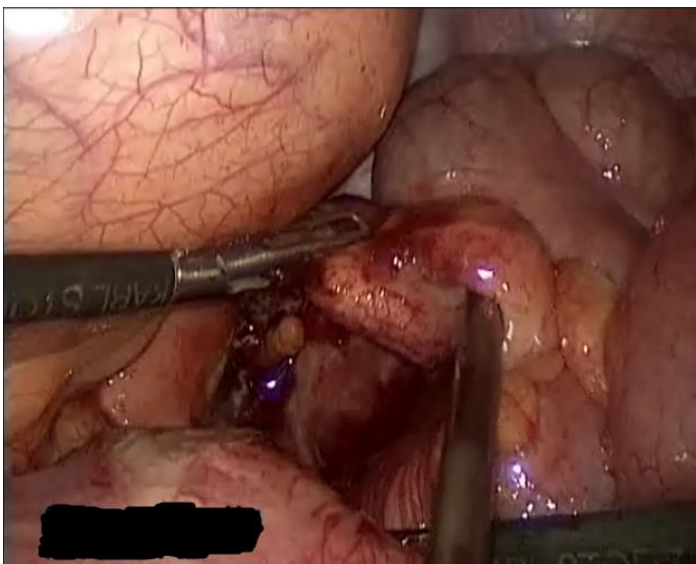


Figure 5.1: Appendiceal wall showed mucosal ulceration, transmurular neutrophilic infiltration and necrosis extending to Periappendiceal fat (H & E, x4).

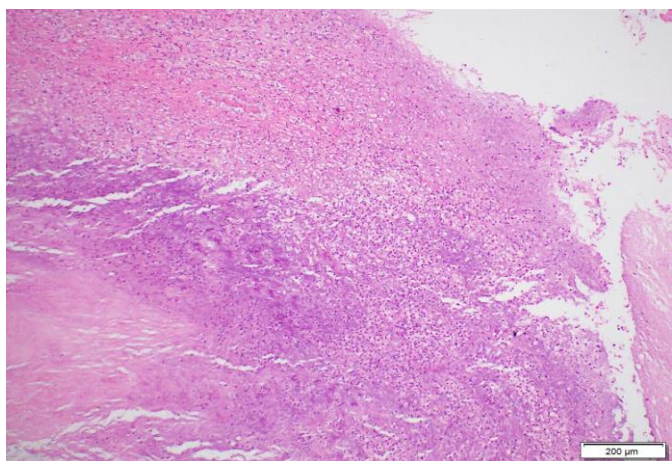


Figure 5.2: Appendiceal wall showed transmural neutrophilic infiltration and necrosis extending to serosal surface (H & E, x10).

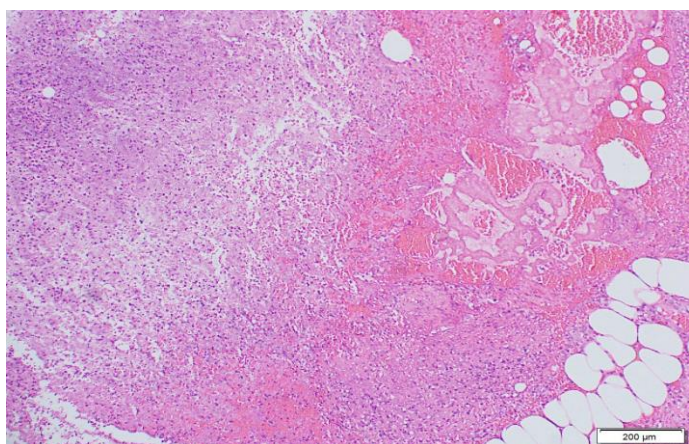


Figure 5.3: Periappendiceal fat showed congested blood vessels, hemorrhage and abscess formation (H & E, x10).

Conclusion

Mechanical small bowel obstruction secondary to acute appendicitis is an uncommon but clinically significant condition that may obscure the typical presentation of appendicitis and delay diagnosis. When features of intestinal obstruction coexist with signs of intra-abdominal inflammation, clinicians should maintain a high index of suspicion for rare underlying causes, including complicated

appendicitis. Early use of cross-sectional imaging, particularly computed tomography, can facilitate accurate diagnosis and guide timely surgical intervention. Prompt operative management, typically consisting of appendectomy and relief of obstruction, is associated with favorable outcomes. Awareness of this rare association may improve diagnostic accuracy and reduce the risk of complications.

Learning Points:

- Acute appendicitis is a rare but important cause of mechanical small bowel obstruction and may present primarily with symptoms of bowel obstruction rather than classic appendicitis features.
- Normal leukocyte count does not exclude complicated appendicitis; elevated inflammatory markers such as C-reactive protein may provide important diagnostic clues.
- Computed tomography plays a crucial role in identifying the underlying cause of obstruction and guiding timely surgical management.

Declarations

Informed consent and consent for publication: Consent for publication has been obtained from the patient and the authors. The patient agreed to publish their medical information in the manuscript.

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Availability of data and material: Data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics approval: This study was conducted in accordance with the Declaration of Helsinki. Ethical approval to conduct and publish this research was obtained from Al-Emadi Hospital.

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