Mesenteric Cyst as a Diagnostic Pitfall Mimicking Perforated Appendicitis and Causing Generalized Peritonitis: A Case Report

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Abstract

Mesenteric cysts are rare and benign intra-abdominal lesions that can mimic acute appendicitis particularly in young patients, posing a diagnostic challenge. We report a multilocular mesenteric cyst causing generalized peritonitis clinically indistinguishable from perforated appendicitis. A 24-year-old man presented with worsening diffuse abdominal pain and anorexia, preceded by a one-week history of migratory epigastric pain and fever. Examination showed generalized tenderness with guarding and rebound tenderness. Laboratory tests revealed marked leukocytosis, neutrophilia, and an elevated neutrophil-to-lymphocyte ratio. Abdominal Xray showed no free air but a mass effect in the right hemiabdomen, presumed to be a periappendiceal inflammatory mass. With an Alvarado score of 8, he underwent emergency laparotomy for suspected perforated appendicitis. A large multilocular mass was found posterior to the ascending and transverse colon, together with suppurative appendicitis and dense adhesions. Mass excision, omentectomy, and appendectomy were performed. Histopathology confirmed a mesenteric cyst with xanthogranulomatous inflammation without epithelial lining or malignancy. The postoperative course involved transient electrolyte disturbances and ileus, both managed conservatively and the patient was discharged in stable condition on postoperative day 5. A high Alvarado score reliably indicates the need for surgical exploration but cannot exclude alternative intra-abdominal pathology with an overlapping presentation. Systematic intraoperative evaluation and complete excision of unexpected masses remain essential for accurate diagnosis and favorable outcomes.

Keywords: *Mesenteric Cyst, Appendicitis, Peritonitis, Alvarado Score, Xanthogranulomatous Inflammation, Case Report.*

A. INTRODUCTION

Mesenteric cysts are rare and benign intra-abdominal lesions that can arise anywhere along the gastrointestinal mesentery. The incidence was reported one in 100,000 to 250,000 hospital admissions. They are classified histologically into lymphatic, mesothelial, enteric, and other rarer subtypes (Mookherjee et al., 2024; Nicolae-dragos et al., 2025). Up to 40% are discovered incidentally, while symptomatic patients most often present with vague and nonspecific abdominal pain, a minority progress to acute complications such as obstruction, torsion, hemorrhage, or rupture, occasionally producing a surgical emergency that mimics acute appendicitis particularly in younger patients (Cervantes et al., 2023; Nicolae-dragos et al., 2025).

This clinical overlap poses a genuine diagnostic challenge. Even though the Alvarado score is widely used to stratify the likelihood of appendicitis, its specificity has been reported to be as low as 57% in prospective cohorts. A high Alvarado score does not reliably exclude alternative intra-abdominal pathology with an overlapping clinical picture (Inteti et al., 2024). A definitive diagnosis is therefore sometimes achieved only intraoperatively, although advances in cross-sectional imaging such as computed tomography and magnetic resonance imaging have improved preoperative characterization of mesenteric cystic lesions in some reported cases (Monteiro et al., 2025). Coexistence of a mesenteric cyst with acute appendicitis has rarely been reported in adults and the relationship between the two remains poorly understood (Cercelaru et al., 2025; Cervantes et al., 2023). We report a young man who was clinically diagnosed with perforated appendicitis based on a high Alvarado score, whose intraoperative findings ultimately revealed generalized peritonitis secondary to a multilocular mesenteric cyst coexisting with suppurative appendicitis.

B. CASE PRESENTATION

A 24-year-old man presented to the emergency department with worsening diffuse abdominal pain, following a one-week history of intermittent epigastric pain that gradually migrated before becoming generalized. Other symptoms were reported including anorexia and febrile one week earlier. Physical examination showed stable hemodynamics, abdominal tender with guarding, rebound tenderness, and bowel sounds were present. Admission laboratory investigations showed marked leukocytosis with neutrophil predominance and an elevated neutrophil-to-lymphocyte ratio, together with normal coagulation parameters **(Table 1).** Preoperative abdominal Xray (supine, erect, and left lateral decubitus views) showed no free intraperitoneal air or free fluid and no bowel dilation, but demonstrated a well-defined, oval intraperitoneal opacity in the right hemiabdomen, extending from approximately the T12–L1 to L4 vertebral level, displacing small and large bowel gas into the left hemiabdomen. Findings interpreted as an intraperitoneal mass in the right hemiabdomen, presumed at the time to represent a periappendiceal inflammatory mass **(Figure 1).** Given the results of an Alvarado score of 8 and these preoperative findings, he was clinically diagnosed with peritonitis secondary to perforated appendicitis and taken for emergency exploratory laparotomy.

Table 1. Summary of Laboratory Investigations During Hospitalization.

Parameter	Reference Range	Admission	Pre-op	POD-1	POD-4
Hematology					
Hemoglobin (g/dL)	13.2–17.3	12.7	–	–	–
WBC (×10³/μL)	3.80–10.60	14.29	–	–	–
Neutrophil (%)	50.0–70.0	87.5	–	–	–
NLR	≤3.13	12.5	–	–	–
Platelet (×10³/μL)	150–440	324	–	–	–
Coagulation					
PT (s)	9.3–11.4	11.5	–	–	–

INR	0.90–1.10	1.02	–	–	–
aPTT (s)	21.8–28.0	28.1	–	–	–
Renal Function & Electrolytes					
Ureum (mg/dL)	15–45	–	33	–	21
Creatinine (mg/dL)	0.70–1.20	–	1.4	–	0.7
eGFR, CKD-EPI (mL/min/1.73 m²)	–	–	70	–	132
Sodium (mmol/L)	136–145	–	125	121	–
Potassium (mmol/L)	3.5–5.1	–	2.4	3.9	–
Chloride (mmol/L)	94–110	–	93	88	–
Random glucose (mg/dL)	70–140	–	124	–	–

Abbreviations: POD, postoperative day; WBC, white blood cell count; NLR, neutrophil-to-lymphocyte ratio; PT, prothrombin time; INR, international normalized ratio; aPTT, activated partial thromboplastin time; eGFR, estimated glomerular filtration rate.

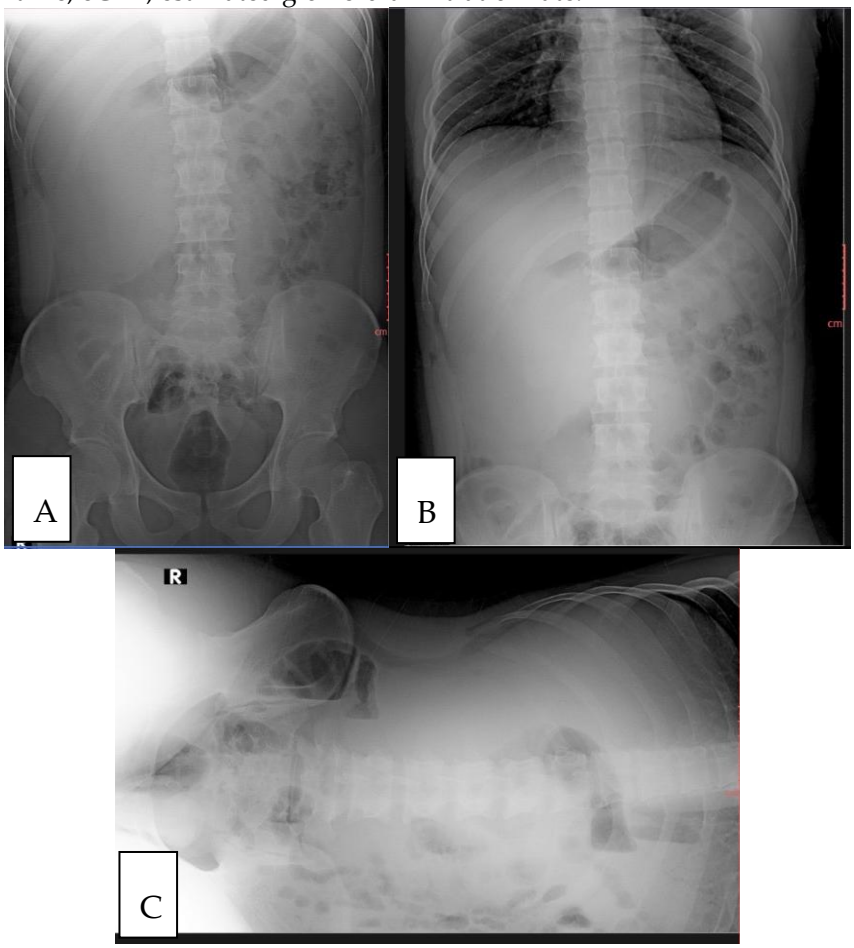

Figure 1. Preoperative abdominal Xray on (A) supine, (B) erect view, (C) and left lateral decubitus view showed no free intraperitoneal air or fluid and no bowel dilation, but demonstrated a well-defined oval intraperitoneal opacity in the right hemiabdomen displacing bowel gas into the left hemiabdomen.

Under general anesthesia, a midline laparotomy was performed. Extensive omental adhesions were encountered in the right abdominal region and released by sharp adhesiolysis, followed by omentectomy. Systematic evaluation of the entire bowel, from the ligament of Treitz to the rectum, revealed no perforation or other

abnormality. A large mass with mixed cystic and solid consistency was identified posterior to the ascending and transverse colon and was carefully dissected free from the surrounding mesentery and adjacent bowel, which remained intact throughout **(Figure 2).** The appendix was thickened, hyperemic, and covered with fibrinopurulent exudate, consistent with acute suppurative appendicitis, and an appendectomy was performed. The mass, omentum, and appendix were sent en bloc for histopathological examination **(Figure 3).**

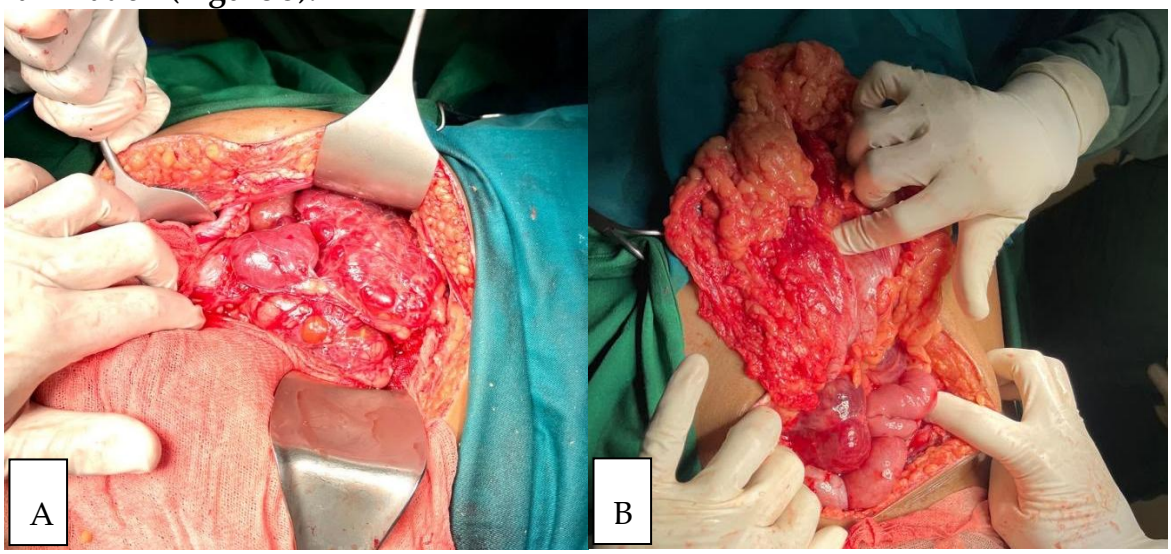

Figure 2. Intraoperative of the mesenteric mass. (A) After adhesiolysis and omentectomy, a large multiloculated mass with a coalescent, grape-like surface is seen occupying the right paracolic region, posterior to the ascending colon. (B) Sharp mobilization of the mass from the posterior transverse colon, demonstrating its close anatomical relationship to the adjacent small bowel loops and mesentery.

Figure 3. Gross appearance of the resected specimens. Upper left: the multilocular mesenteric cyst mass, showing hemorrhagic content and coalescent cystic locules of variable size. Upper right: the excised omentum. Bottom: the appendix, grossly thickened, consistent with acute suppurative appendicitis.

The patient was managed postoperatively in the high care unit. He developed marked hypokalemia and hyponatremia that progressively worsened despite initial correction, requiring intravenous potassium and hypertonic saline together with input from the internal medicine team. Both gradually normalized, alongside a transient rise in creatinine that resolved by postoperative day 4 (Table 1). His course was also notable for transient bilious vomiting and delayed return of bowel function over postoperative days 2–3. He was managed conservatively with bowel rest, antiemetics, and a rectal enema. The abdominal drain was removed on postoperative day 4 as output declined. He was discharged in stable condition on postoperative day 5 with oral antibiotics and analgesia. Histopathological examination of the resected specimen consisting of three multicystic tissue fragments with the largest measuring 11 × 7 × 6 cm. The specimen subsequently confirmed the diagnosis of the cyst walls lacked a surface epithelial lining and instead showed fibrovascular stroma with dense lymphoplasmacytic and neutrophilic infiltration, cholesterol clefts, histiocytic aggregates, and a foreign-body type granulomatous reaction, with no malignancy identified. Those finding consistent with a mesenteric cyst with xanthogranulomatous inflammation.

C. RESULTS AND DISCUSSION

Mesenteric cysts encompass a heterogeneous group of lesions including lymphatic, mesothelial, enteric, and other rarer subtypes. The nonspecific presentation frequently delays diagnosis (Nicolae-dragos et al., 2025). In our patient, the combination of migratory abdominal pain, anorexia, guarding, rebound tenderness, and leukocytosis with neutrophilia yielded an Alvarado score of 8, a threshold usually considered indicative of appendicitis. However, the score's sensitivity is high but its specificity comparatively poor. A recent prospective cohort reported a specificity of only 57.1% against histopathological diagnosis (Inteti et al., 2024). This score was designed to stratify the likelihood of appendicitis among patients already suspected of having it, not to exclude alternative intra-abdominal pathology with an overlapping clinical picture. The reason a mesenteric cyst could not be recognized preoperatively in this case lies in the nonspecific nature of every available diagnostic input: the peritoneal signs, leukocytosis, and elevated inflammatory markers reflect a generalized inflammatory response rather than any organ-specific process, and could equally result from perforated appendicitis, an infected or ruptured mesenteric cyst, or several other intra-abdominal emergencies. This is the central diagnostic lesson of the present case: a high Alvarado score correctly identified the need for urgent surgical exploration, but neither the clinical picture nor plain radiography could distinguish appendicitis from a mesenteric cystic process producing an identical peritoneal picture. The preoperative abdominal Xray reinforced this impression rather than challenging it. It showed no free intraperitoneal air or fluid, arguing against a classic perforated hollow viscus, but did demonstrate a mass effect that was reasonably presumed at the time to represent a periappendiceal inflammatory mass, a recognized feature of complicated appendicitis. Plain

radiography, however, can only demonstrate the presence and general location of a mass; it cannot characterize its internal architecture, wall composition, or organ of origin. Only at laparotomy did this mass prove to originate not from the appendix but from the mesenteric cyst, illustrating how a radiographic finding entirely compatible with the working diagnosis can nonetheless originate from an unrelated pathology.

Coexistence of a mesenteric cyst with acute appendicitis is itself rarely documented. Hernandez-Cervantes et al. described a 51-year-old man in whom a simple mesenteric cyst was identified alongside acute appendicitis on preoperative computed tomography, managed by cyst enucleation and appendectomy (Cervantes et al., 2023). (Cervantes et al., 2023). More recently, Barbu et al. reported an adult with phlegmonous appendicitis coexisting with a large mesenteric cystic lymphatic malformation, an association they characterized as an intraoperative diagnostic and surgical challenge requiring an anatomy-driven case-by-case approach (Cercelaru et al., 2025). Our case adds to this small body of literature but differs in severity: rather than an incidental finding on preoperative imaging, the cyst and its associated grade III–IV adhesions were themselves the source of generalized peritonitis, recognized only after adhesiolysis had begun. Whether the appendiceal inflammation in this case represents a genuinely independent process or a secondary consequence of chronic mechanical irritation by the adjacent cyst cannot be established from a single case, and we present this only as a hypothesis rather than a demonstrated mechanism. The recurring co-occurrence across these few reports may simply reflect the general rarity of both conditions rather than a causal relationship, and larger case series would be needed before any pathophysiological link could be inferred. The histopathological findings in our case are nonetheless informative for confirming the diagnosis and excluding other mesenteric cystic lesions. The cyst wall lacked any surface epithelial or endothelial lining, arguing against a cystic lymphangioma, which is typically lined by flat lymphatic endothelium, and against an enteric duplication cyst, which characteristically shows gastrointestinal-type mucosa with a smooth muscle wall. Instead, the wall showed cholesterol clefts, histiocytic aggregates, and a foreign-body type granulomatous reaction, a xanthogranulomatous pattern indicating a longstanding chronic inflammatory process rather than an acute, isolated event, and more consistent with an acquired mesothelial cyst that underwent secondary inflammatory change than with a primary lymphangiomatous or enteric malformation, distinct from the classic epithelial-lined subtypes usually described (Nicolae-dragos et al., 2025). Most of true mesenteric cysts described in the radiologic-pathologic literature are unilocular with multilocularity considered relatively specific to cystic lymphangiomas (Clark et al., 2021). The multiloculated architecture encountered in our patient, arising in a cyst that lacked any epithelial or endothelial lining, more likely reflects secondary loculation from chronic inflammation, hemorrhage, and fibrosis rather than a primary lymphangiomatous process.

The patient's neutrophil-to-lymphocyte ratio was markedly elevated at 12.5 on admission, a level associated with complicated appendicitis in prior series (Hajibandeh et al., 2019). His postoperative course also included transient

hyponatremia, a pattern associated with the severity of intra-abdominal inflammation (Giannis et al., 2020; Messias et al., 2026; Symeonidis et al., 2022), together with a transient postoperative ileus that was managed successfully with standard supportive measures (Khawaja et al., 2022). These findings are noted only as markers that paralleled the severity of the intraoperative findings, rather than as a central focus of this report.

From a surgical standpoint, our management was adhesiolysis, omentectomy, complete cyst excision, and appendectomy with source control. These management mirrors the approach reported in other symptomatic and complicated mesenteric cysts which complete resection is consistently identified as the treatment of choice to both confirm the diagnosis histologically and prevent recurrence (Armando et al., 2025; Shabana et al., 2020; Shewaye et al., 2025). Systematic evaluation of the entire bowel performed in this case from the ligament of Treitz to the rectum, which allowed the correct diagnosis to be reached intraoperatively once the preoperative impression proved incomplete. This step should not be omitted even when a specific diagnosis appears clinically secure before incision.

This case offers two practical lessons for surgeons and emergency physicians managing an acute abdomen. First, a high Alvarado score should prompt timely surgical exploration, not diagnostic certainty; when intraoperative findings at the expected site of pathology do not fully explain the clinical picture, the differential diagnosis should be broadened immediately rather than forced to fit the preoperative impression. Second, any unexpected intra-abdominal mass encountered intraoperatively warrants systematic evaluation of the bowel and mesentery together with complete excision of the lesion, as this is often the only way to secure both an accurate diagnosis and definitive treatment in real time.

This report has several strengths including histopathological confirmation of the mesenteric cyst, correlation with preoperative radiographic findings, and detailed perioperative documentation supported by intraoperative photographs. Several limitations should nonetheless be acknowledged. As a single case, the findings cannot be generalized to all similar presentations. Only plain abdominal radiography was obtained preoperatively. Ultrasonography, which is rapid and widely available even in emergency settings, might have distinguished the cystic from solid components of the mass and helped clarify its relationship to the appendix, while computed tomography could have further characterized the wall, septations, and anatomical origin of the lesion, potentially broadening the preoperative differential diagnosis beyond appendicitis. Neither was performed in this case, as the severity of the patient's peritonitis placed priority on immediate surgical source control over further preoperative imaging, a trade-off common in acute care settings with limited resources. Long-term follow-up beyond the immediate postoperative period was also not available at the time of writing.

D. CONCLUSION

This case demonstrates that a multilocular mesenteric cyst can produce generalized peritonitis clinically indistinguishable from perforated appendicitis even at a high Alvarado score. This may coexist with genuine suppurative appendicitis. A high clinical suspicion score should prompt timely surgical exploration but must not be mistaken for diagnostic certainty. Systematic evaluation of the bowel and mesentery followed by complete excision of any unexpected mass with appropriate source control remains essential for both an accurate diagnosis and a favorable outcome.

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