Cureus
Part of SPRINGER NATURE

Open Access Case Report

Primary Omental Torsion Mimicking Acute Appendicitis in an Eight-Year-Old Boy: A Diagnostic Challenge in Pediatric Acute Abdomen

Aleksandra Spoczynska [1], Mateusz Zienkiewicz [1], Marek Wolski [1]

1. Department of Paediatric Surgery, Medical University of Warsaw, Warsaw, POL

Corresponding author: Aleksandra Spoczynska, aleksandra.spoczynska@gmail.com

Review began 10/15/2026
Review ended 10/26/2026
Published 10/31/2026

© **Copyright** 2026
Spoczynska et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI: 10.7759/cureus.118888

Abstract

Omental torsion is an uncommon etiology of acute abdominal pain in the pediatric population, arising from the rotation of the greater omentum along its longitudinal axis, thereby precipitating vascular compromise and tissue ischemia. Due to its exceptionally low incidence in the pediatric population, it is frequently misdiagnosed as acute appendicitis. Although conservative management with anti-inflammatory and prophylactic antibiotic therapy is possible, laparoscopic intervention is most commonly elected; the definitive diagnosis is usually established intraoperatively. In this article, we report the case of an eight-year-old boy who presented to the hospital with a three-day history of right lower quadrant abdominal pain, nausea, and vomiting. Laboratory tests showed a normal white blood cell count with mildly elevated neutrophils (8.98 ×10^3/μL), monocytes (1.32 ×10^3/μL), and C-reactive protein (3.59 mg/dL). Physical examination revealed right lower quadrant tenderness and localized guarding. Ultrasonography showed soft tissue edema and bowel wall thickening without visualizing the appendix. Diagnostic laparoscopy revealed a normal appendix and a twisted, necrotic segment of the greater omentum with inflammatory adhesions in the right flank, which was resected. After achieving hemostasis and aspirating pelvic fluid, the abdomen was closed without an appendectomy. To elucidate the diagnostic dilemmas in distinguishing this entity from acute appendicitis, the leading cause of the acute abdomen, we performed a literature review, emphasizing that although primary omentum torsion is rare, it should be included in the differential diagnosis in the presence of atypical clinical presentations and diagnostic discrepancies. A total of 14 interesting articles were selected, comprehensively addressing the clinical spectrum of the disease.

Categories: General Surgery, Pediatric Surgery, Pediatrics
Keywords: acute abdomen in children, differential diagnosis of acute abdomen, omental torsion predisposing factors, pediatric laparoscopic surgery, peditric acute appendicitis, primary omental torsion

Introduction

The greater omentum is a double-layered peritoneal fold derived from the dorsal mesoderm, suspended from the greater curvature of the stomach and the superior part of the duodenum, draping over the intestinal loops [1]. The greater omentum is continuous superiorly and laterally with structures such as the gastrosplenic and splenocolic ligaments [2]. The right side of the omentum is longer, heavier, and more mobile, which predisposes it to clockwise or counterclockwise rotation along its longitudinal axis [2,3]. This torsion compromises blood vessels, thereby leading to tissue ischemia [2,4]. Because of this anatomical predisposition on the right side of the abdominal cavity, it creates a clinical mimicry of acute appendicitis due to the right lower quadrant location of the appendix [3,5,6]. In contrast, the left side of the greater omentum exhibits greater structural stability, being firmly anchored by its anatomical continuity with the gastrosplenic and splenocolic ligaments [2]. Furthermore, congenital anomalies and anatomical variations, particularly in its right lower segment, such as bifid omentum, tongue-like projection from the free edge of the omentum, redundant omental veins, accessory omentum, and uneven distribution of fat within omentum due to obesity, increase the likelihood of greater omentum torsion [5,7,8]. In the pediatric population, this condition is exceptionally rare, accounting for approximately four cases per 1,000 instances of acute appendicitis (roughly 0.1% to 0.5%) [3]. Furthermore, pediatric patients frequently manifest milder or more insidious symptoms than adults, which consequently contributes to a delayed medical presentation and evaluation [3]. Primary omental torsion is predominantly idiopathic in etiology; however, emerging evidence indicates an elevated risk associated with specific predisposing factors, including obesity, an irregular omental fat distribution, accessory omentum, vascular malformations, altered peristaltic activity, mechanical trauma, and a sudden increase in intra-abdominal pressure [4,6,8]. Studies indicate that most pediatric patients with primary omental torsion present with a BMI exceeding the 95th percentile [6]. Excessive and irregularly distributed adipose tissue creates a mechanical barrier that compromises omental blood flow. Additionally, obesity-induced immune shifts, specifically a reduction in regulatory T cells (Tregs) and an increase in CD8+ T lymphocytes, intensify the local inflammatory response [6,9].

Case Presentation

An eight-year-old boy presented with a three-day history of progressively worsening abdominal pain

centered in the right lower quadrant, accompanied by nausea and emesis. He reported anorexia, whereas bowel habits remained regular and diuresis was preserved without dysuria. The patient denied any history of fever, infectious prodrome, or prior abdominal trauma. On physical examination, the abdomen was soft, demonstrating tenderness and localized muscular guarding strictly confined to the right lower quadrant. There were no palpable pathological masses or signs of generalized peritonitis, and bilateral Goldflam signs were negative. Laboratory investigations revealed normal white blood cell count with mildly elevated neutrophils (8.98 $\times 10^3/\mu L$), monocytes (1.32 $\times 10^3/\mu L$), and C-reactive protein (CRP) (3.59 mg/dL) (Table *1*). Abdominal ultrasonography did not visualize the appendix but demonstrated edema of the right lower quadrant soft tissues and thickening of the cecal and ascending colon walls (Figure *1*). This clinical presentation raised suspicion for retrocecal appendicitis. Diagnostic laparoscopy was performed under general anesthesia through a three-trocar configuration (10 mm, 5 mm, and 5 mm) with standard video assistance to confirm or exclude the preliminary diagnosis. Intraoperatively, the appendix was visualized in a normal anatomical position and appeared unremarkable (Figure *2*). Therefore, no appendectomy was performed. As depicted in Figure *3*, a twisted, necrotic segment of the greater omentum with surrounding inflammatory adhesions was identified within the right flank and successfully resected using an advanced bipolar vessel-sealing device (LigaSure). Hemostasis was achieved, and serosanguineous fluid collected from the lesser pelvis was aspirated for microbiological culture. Pelvic fluid cultures showed no bacterial growth. The trocar incision sites were subsequently closed in layers. Postoperatively, the patient experienced two episodes of transient vomiting that resolved promptly after the administration of antiemetics. Vital signs and laboratory parameters remained within normal limits. Postoperative management included intravenous fluid administration with Optilyte and antimicrobial coverage with cefazolin and metronidazole. Analgesics were administered sequentially based on pain intensity: initial severe pain was managed with metamizole and paracetamol, followed by ibuprofen as pain intensity subsided. All medications were administered intravenously. Wound healing progressed uneventfully, with surgical dressings remaining clean and intact throughout. The patient was discharged on the second postoperative day. Follow-up evaluation at 14 days confirmed an uncomplicated recovery with no adverse events. Histopathological examination of the resected specimen revealed segments of the greater omentum demonstrating marked hyperemia, hemorrhagic extravasation, and necrotizing purulent changes.

Parameter	Patient Result	Reference Range	Units
White Blood Cells (WBC)	11,68	4,00 - 12,00	10^3/µL
Neutrophils	8,96	1,50 - 7,50	10^3/µL
Monocytes	1,32	0,19 - 0,85	10^3/µL
C-Reactive Protein (CRP)	3,59	<0,5	mg/dl

TABLE 1: Laboratory test results of the patient upon admission.



FIGURE 1: The appendix is not visualized; tissue edema and thickening of the cecal and ascending colon walls are present.

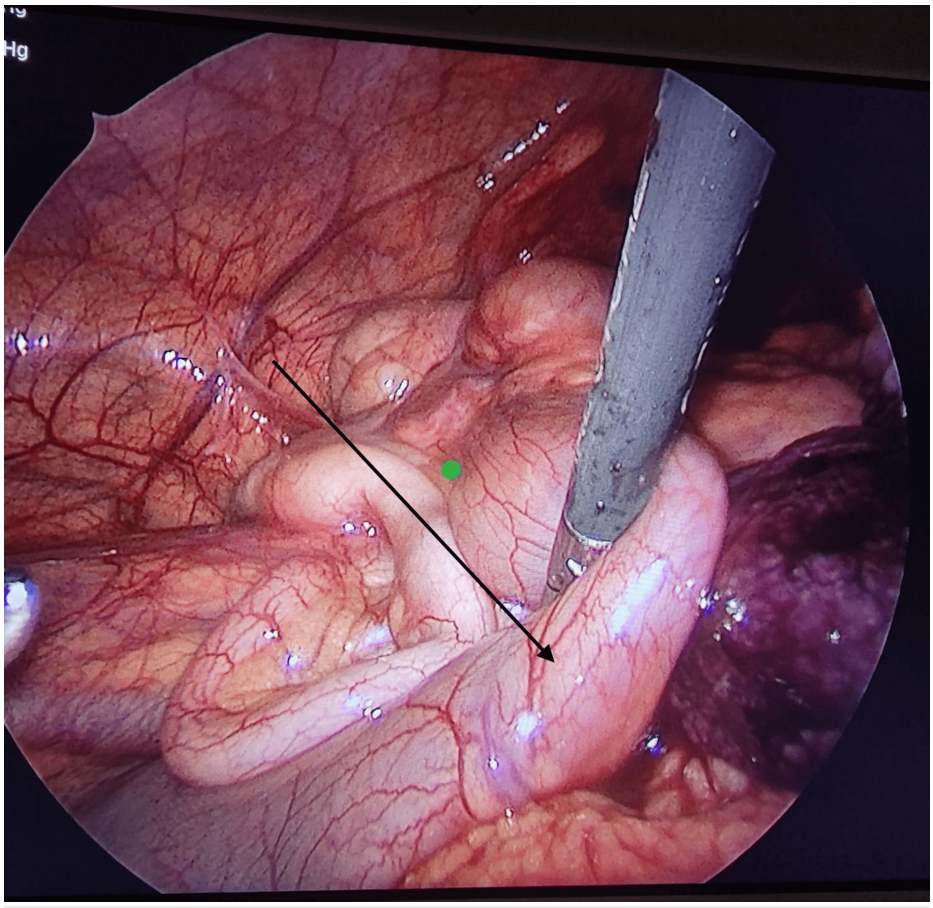


FIGURE 2: Intraoperative laparoscopic view of a normal appendix.

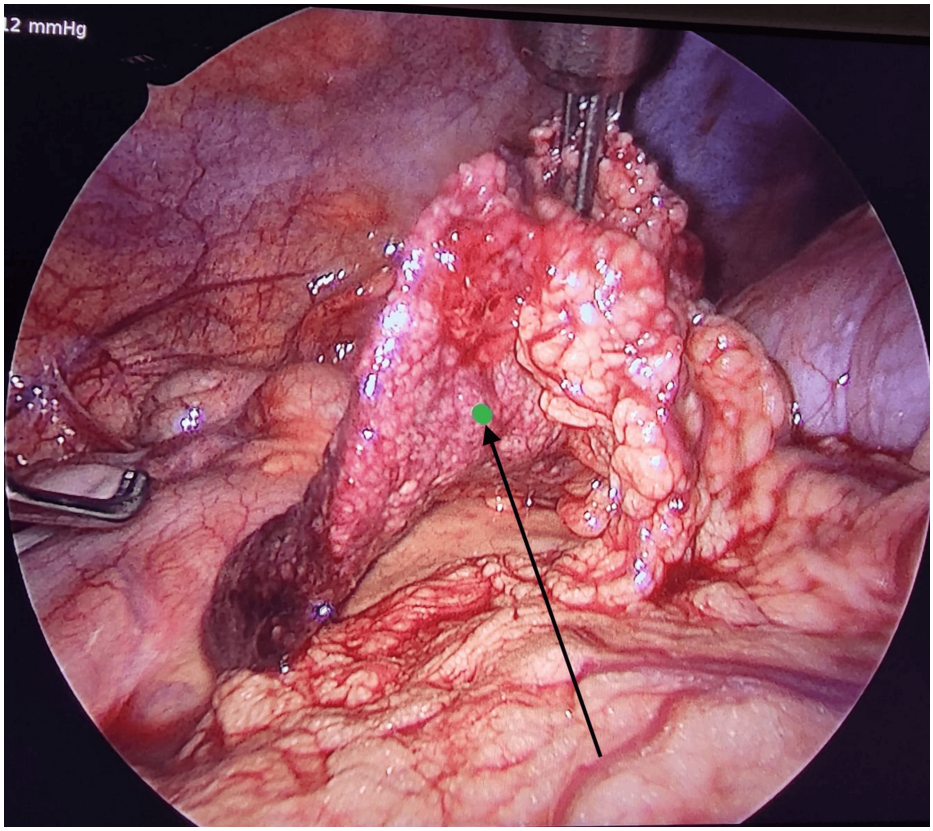


FIGURE 3: Intraoperative laparoscopic view of a necrotic segment of the greater omentum.

Discussion

Primary omental torsion is well documented to predominantly occur in adults in their fourth and fifth decades of life. However, it remains an exceedingly rare entity in the pediatric population, making its diagnosis a significant challenge for clinicians due to its rarity [10]. Only 0.6-4.8% of cases are diagnosed preoperatively; the majority, however, are diagnosed during laparoscopic procedures, as stated by Gavriilidis et al. [2,5]. Unfortunately, ultrasound has low diagnostic sensitivity of only 11.3%, whereas computed tomography (CT) is the optimal diagnostic modality, achieving an accuracy of 72.7%, as shown by the 2024 study conducted by Alexopoulos et al. [3]. Therefore, in this article, we emphasize the characteristic clinical features of this entity that facilitate a correct diagnosis. Ultrasound imaging criteria that may indicate primary omental torsion include free fluid in the right iliac fossa, hyperechoic mesentery without internal blood flow, a normal appendix, and whirl sign [2,3,7,11,12]. Furthermore, a fatty mass located directly beneath the parietal peritoneum is observed, which forms a thickening and exhibits local inflammation. This condition typically manifests as fixed, sudden right lower quadrant pain in a patient who often appears well and afebrile [4,5]. Unlike appendicitis, it rarely presents with gastrointestinal symptoms, and laboratory markers remain generally normal or only mildly elevated, as shown by the 2024 study [3]. In contrast, acute appendicitis is characterized by migratory pain and systemic symptoms such as fever, nausea, and anorexia, accompanied by significant leukocytosis and elevated CRP levels [13]. Diagnosis is confirmed by imaging revealing a dilated appendix (exceeding 6 mm in diameter) with wall thickening and surrounding fat stranding [13]. Conservative management of omental infarction, comprising anti-inflammatory therapy, analgesia, and antibiotic prophylaxis, typically fails to provide outcomes comparable to surgical intervention; therefore, any delay in performing surgery carries the risk of severe complications such as adhesions, intra-abdominal abscesses, or sepsis [2,14]. Consequently, the standard of care remains laparoscopic resection of the necrotic omentum, either total or partial, depending on the extent of the lesions, as indicated by the work of many researchers [2-4]. Due to the high prevalence of acute appendicitis as the leading cause of acute abdomen in children, other clinical entities are frequently overlooked, leading to misdiagnosis. Alongside primary omental torsion, the differential diagnosis encompasses conditions predominantly relevant to the pediatric population, such as Crohn's disease, Meckel's diverticulitis, intestinal infections, mesenteric lymphadenitis, pyelonephritis, nephrolithiasis, ovarian torsion, and ovarian cyst rupture or hemorrhage, as well as entities more frequently encountered in adults, including cecal and ascending colon diverticulitis, acute cholecystitis, pelvic inflammatory disease, peptic ulcer disease and perforation, epiploic appendagitis, mesenteric panniculitis, and renal cyst rupture or hemorrhage [3,4,11]. Additionally, rare fat-containing tumors (e.g., lipomas, liposarcomas, teratomas, and

angioliposarcomas) may present with similar manifestations, though their incidence in children is extremely low [3,4,11]. Primary omental torsion can be easily misdiagnosed as acute appendicitis, diverticulitis, or mesenteric ischemia, while in female patients, it is additionally mistaken for ectopic pregnancy, salpingitis, or ovarian torsion, as reported by Mohtar et al. in their 2024 study [2]. In an eight-year-old boy presenting with elevated CRP, mild neutrophilia, and monocytosis, the primary diagnostic considerations include acute appendicitis, gastrointestinal infection, mesenteric lymphadenitis, and urinary tract infection. Although less common, Meckel's diverticulitis and primary omental torsion must also be considered. While certain conditions are rare in pediatrics and predominant in adults, maintaining a broad differential diagnosis remains essential, as low prevalence alone does not preclude their potential presentation as an acute abdomen. To ensure a comprehensive diagnostic perspective and maintain a high index of clinical suspicion, the evaluation of primary omental torsion should integrate characteristic ultrasound findings, such as a hyperechoic subperitoneal fatty mass or the Doppler "whirl sign", with recognized risk factors, including anatomical anomalies (bifid omentum, accessory omentum, omental tongue) and obesity. None of these predisposing factors were identified in our patient. Given the non-visualization of the appendix on ultrasound and the deliberate omission of CT to spare the child from ionizing radiation (ALARA principle) and avoid surgical delay, early diagnostic laparoscopy served as the definitive approach for both visualization and immediate resection.

Conclusions

Primary omental torsion remains an extremely rare entity in the pediatric population and occurs predominantly in adults, rendering its clinical presentation particularly subtle; therefore, diagnosing this condition is frequently challenging, which easily leads to delayed or missed diagnoses. This report underscores the importance of considering primary omental torsion in the differential diagnosis of suspected acute appendicitis, particularly when clinical findings are atypical and ambiguous, thereby helping patients avoid complications resulting from delayed or inappropriate management. However, it must be acknowledged that the vast majority of cases are diagnosed intraoperatively, as conservative management is rarely attempted or effective due to the nature of this pathology.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Aleksandra Spoczynska, Marek Wolski

Acquisition, analysis, or interpretation of data: Aleksandra Spoczynska, Mateusz Zienkiewicz

Drafting of the manuscript: Aleksandra Spoczynska, Mateusz Zienkiewicz

Critical review of the manuscript for important intellectual content: Mateusz Zienkiewicz, Marek Wolski

Supervision: Marek Wolski

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

1. Wang AW, Prieto JM, Cauvi DM, Bickler SW, De Maio A: The greater omentum-a vibrant and enigmatic immunologic organ involved in injury and infection resolution. Shock. 2020, 53:384-90. 10.1097/SHK.0000000000001428
2. Mohtar F, Shaar S, Saliba M, Haydar A, Alameh A: Omental torsion mimicking acute appendicitis: a case report. Int J Surg Case Rep. 2024, 121:109917. 10.1016/j.ijscr.2024.109917
3. Alexopoulos V, Sinopidis X, Louta A, et al.: Primary omental torsion in children in the laparoscopy era: what have we learned so far?. In Vivo. 2024, 38:1030-41. 10.21873/invivo.13536
4. Barai KP, Knight BC: Diagnosis and management of idiopathic omental infarction: a case report . Int J Surg Case Rep. 2011, 2:138-40. 10.1016/j.ijscr.2011.02.014
5. Gavriilidis P, Di Saverio S, Podda M, de'Angelis N: Primary segmental omental torsion, mimicking acute

appendicitis. J Med Life. 2024, 17:123-5. 10.25122/jml-2023-0429
6. Khalid K, Somuah TS, Aziz E, Mohamed R, Youssef B: Primary omental torsion in children: case report . Pan Afr Med J. 2013, 14:57. 10.11604/pamj.2013.14.57.1321
7. Theriot JA, Sayat J, Franco S, Buchino JJ: Childhood obesity: a risk factor for omental torsion . Pediatrics. 2003, 112:e460. 10.1542/peds.112.6.e460
8. Scabini S, Rimini E, Massobrio A, et al.: Primary omental torsion: a case report . World J Gastrointest Surg. 2011, 3:153-5. 10.4240/wjgs.v3.i10.153
9. Valentine Y, Nikolajczyk BS: T cells in obesity-associated inflammation: the devil is in the details . Immunol Rev. 2024, 324:25-41. 10.1111/imr.13354
10. Tsironis A, Zikos N, Bali C, Pappas-Gogos G, Koulas S, Katsamakis N: Acute abdomen due to primary omental torsion: case report. J Emerg Med. 2013, 44:e45-8. 10.1016/j.jemermed.2011.06.066
11. McCreary DJ, Fraser I, Chan N: When omental infarction imitates appendicitis: advancing diagnosis with POCUS. POCUS J. 2025, 10:97-102. 10.24908/pocusj.v10i02.19337
12. Oğuzkurt P, Kotiloğlu E, Tanyel FC, Hiçsönmez A: Primary omental torsion in a 6-year-old girl . J Pediatr Surg. 1995, 30:1700-1. 10.1016/0022-3468(95)90456-5
13. Moris D, Paulson EK, Pappas TN: Diagnosis and management of acute appendicitis in adults: a review . JAMA. 2021, 326:2299-311. 10.1001/jama.2021.20502
14. Nubi A, McBride W, Stringel G: Primary omental infarct: conservative vs operative management in the era of ultrasound, computerized tomography, and laparoscopy. J Pediatr Surg. 2009, 44:953-6. 10.1016/j.jpedsurg.2009.01.032