

CASE REPORT

Non-operative management of primary omental torsion, a case report and literature review

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Abstract

Primary omental torsion is a rare cause of acute abdomen especially in obese patients with inconsistent history, examination, and laboratory findings. The liberal use of computed tomography in casualties has increased its preoperative diagnosis. Despite the controversy, the non-operative approach should be attempted as a first line of management while the laparoscopic resection should be only considered after failure of non-operative management.

KEYWORDS

acute abdomen, non-operative management, omental torsion

1 | INTRODUCTION

Primary omental torsion represents a rare cause of acute abdomen. Its preoperative diagnosis is challenging owing to its unspecific symptoms and signs. There is no definite consensus for its best management approach. We present a case of primary omental torsion that was successfully managed non-operatively after a definitive radiological diagnosis.

Differential diagnoses for the acute abdomen are diverse, and primary omental torsion represents one of its rare causes.¹ Traditionally, it was merely intraoperative diagnosis as its preoperative diagnosis was challenging owing to its unspecific symptoms and signs. The preoperative diagnosis has been estimated to be established in less than 5% of all cases. However, the extensive use of different imaging modalities in surgical emergencies has increased the rate of accurate preoperative diagnosis of omental torsion.²

There is no definite consensus for the best management approach if the omental torsion is preoperatively diagnosed

based on imaging studies.³ Historically, surgical resection has been widely performed as it was usually diagnosed intra-operatively. However, a conservative non-operative approach can be beneficial in many cases when its diagnosis is confidently established.³

Herein, we present a young male patient who was preoperatively diagnosed as primary omental torsion based on the characteristic computed tomography (CT) findings and was successfully managed non-operatively.

2 | CASE PRESENTATION

An 18-year-old male patient presented to the emergency department, for the second time within 1 week, with recurrent attacks of severe colicky abdominal pain that was associated with nausea, vomiting, and constipation. Initially at the first presentation, the pain was vague, all over the abdomen that was relieved by paracetamol without any imaging modalities. However, the pain started to progressively increase

in the 24 h prior to the second presentation and became localized in the right lower quadrant. He had no other relevant symptoms, and his past medical and surgical history was unremarkable.

Upon examination, he looked in pain and had tachycardia of 117 beats/min, low-grade fever of 37.8°, and a normal blood pressure. He was obese with body mass index of 31.6 Kg/m² (82 Kg, 1.61 m). His abdomen was tender at the right iliac fossa and supra-pubic with rebound tenderness at the right iliac fossa and audible normal peristalsis. The rest of the examination was unremarkable. His laboratory investigations were positive for leukocytosis ($13.6 \times 10^6/\mu\text{l}$) with neutrophilia (79.9%), elevated erythrocyte sedimentation rate (29), and elevated C-reactive protein (25.39 mg/dl). Other laboratory results including hemoglobin level, renal function, and liver function tests were unremarkable. He underwent multi-slice CT of the abdomen with intravenous (IV) contrast which showed a right-sided intraperitoneal concentric-pattern mass of fat density with whirling appearance, extending from the umbilicus to the right iliac fossa that was suggestive of omental torsion (Figure 1).

Therefore, the patient was admitted for a trial of non-operative management: Nil per os, IV fluids, analgesia, prophylactic IV antibiotics, and proton pump inhibitors. The antibiotics were ciprofloxacin and metronidazole to cover gram-negative and anaerobic bacteria. He was closely observed clinically, and, fortunately, his abdominal pain subsided with non-steroidal anti-inflammatory drugs. He

remained afebrile, with normal vital signs, and his abdominal tenderness gradually improved. Moreover, his leukocytic count, inflammatory markers (CRP, ESR), gradually returned to normal levels. Starting from the third day of admission, he resumed a clear liquid diet which was gradually escalated to a full diet. His condition showed a good improvement on the non-operative management, and he was discharged home, in a good condition, after 7 days. Upon follow-up visit after 1, 3, and 6 months, the patient had no symptoms and his clinical examination was unremarkable.

3 | DISCUSSION

Omental torsion, first described by Eitel in 1899, is a rare cause of acute abdomen with unknown etiology.^{2,4} It affects males twice as frequently as females, usually between the fourth and fifth decade of life. It is more common in obese patients.¹ It usually presents with nonspecific symptoms and signs mimicking other abdominal pathologies, especially acute appendicitis. Thus, its diagnosis has been usually made intraoperatively with only 0.6%–4.8% of cases being preoperatively diagnosed.⁵ However, its preoperative diagnosis is more commonly established nowadays after the liberal use of computed tomography in the causalities.³

The omentum is a peritoneal fold hanging between the stomach and the transverse colon. It divides into right and left omentum. The right-sided omentum is longer, more mobile,

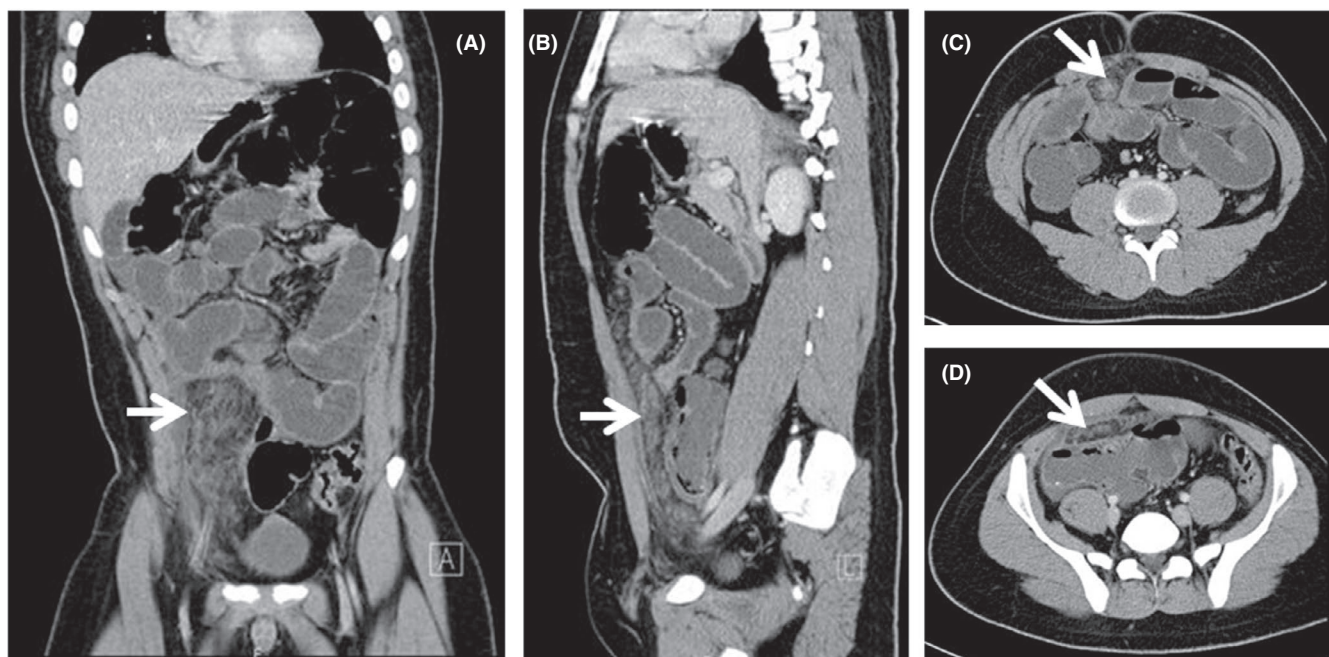


FIGURE 1 Contrast-enhanced computed tomography of the abdomen showing (white arrow) a right-sided intraperitoneal concentric-pattern mass of fat density with whirling appearance, extending from the umbilicus to the right iliac fossa that was suggestive of omental torsion

and, consequently, more common to be twisted along its blood supply causing omental torsion. Omental fat deposition occurs during childhood and is proportionally related to the overall fat.¹

When the omentum twists around its long axis, it leads to venous obstruction with resultant edema and arterial compromise leading to abdominal manifestations.⁵ Omental torsion may lead to omental infarction; however, it is considered a different clinical entity.⁶ Omental torsion is classified according to Leitner's classification into primary (idiopathic) and secondary.⁷⁻⁹ Primary omental torsion occurs without identifiable predisposing abnormalities, while secondary torsion occurred on top of an intra-abdominal pathology as hernias, omental cysts, tumors, or adhesions. Risk factors for omental torsion include obesity, trauma, anatomical variations, and a sudden increase in intra-abdominal pressure.²

Patients with omental torsion usually present with sudden localized abdominal pain aggravated by a sudden movement which may be associated with nausea and vomiting. On examination, there is right-sided tenderness with rebound tenderness. Temperature, total leukocytic count, and inflammatory markers may be slightly elevated or normal. Otherwise, laboratory findings are nonspecific that may delay the diagnosis and management. Its CT findings include a well-circumscribed fatty mass with dilated thrombosed veins.¹

Due to its rarity, the treatment of choice remains controversial with no clear consensus or guidelines, especially with absence of prospective comparative studies.^{1,3} Some authors have recommended surgical management with resection of the twisted omentum. Laparoscopic management is preferred rather than exploration laparotomy as it is associated with better visualization of the abdominal cavity, less postoperative pain, and wound-related complications. It provides clear precise diagnosis, excludes other differential diagnoses, speeds up the recovery by resecting the affected twisted omentum and eliminating the cause of abdominal pain, and, thus, decreases the hospital stay and costs.² However, other experts have suggested the non-operative management, including analgesia and prophylactic antibiotics, based on the natural history of the disease as a self-limited benign condition, hence, avoiding the operative complications.¹⁰ They argue that the recent advances and wide availability of multi-slice CT allow reliable diagnosis, exclusion of other pathologies, and, consequently, substitute the role of diagnostic laparoscopy.^{10,11} The administration of prophylactic antibiotics is justified to guard against hypothetical possibility of abscess formation.¹⁰ And so, laparoscopic management is only reserved for cases with an unclear diagnosis or cases of failed non-operative management in form of persistent pain, fever, and elevated inflammatory markers.^{1,2,3,10,12,13}

Indeed, it is crucial to mention that the successful non-operative management depends on the wide use of the CT in casualties, the presence of expert radiologists with reliable exclusion of other diagnoses as well as the sound clinical judgment with a low threshold for prompt diagnostic laparoscopy in non-responders, cases with doubtful diagnosis, or suspected complications.

A literature review using the search terms 'omental torsion', 'omental infarction', 'conservative', 'non-operative', and 'adult' in the title, abstract, and/or keywords of articles indexed in the Medline, Scopus, and Google Scholar databases during the period from 1990 to 2020 revealed 20 articles reporting successful non-operative management of omental torsion and/or infarction in adult patients. Other articles discussing only pediatric cases were excluded. It is crucial to mention that both terms 'omental torsion' and 'omental infarction' were interchangeably used in the literature. These cases are summarized in Table 1.

In our case, the patient presented for the second time within 1 week with on-and-off right lower quadrant moderate abdominal pain. He was tachycardic with low-grade fever, and his abdominal examination was suggestive of acute appendicitis. His laboratory findings showed slightly elevated leukocytosis and inflammatory markers. Our differential diagnosis at that point was acute appendicitis; however, the long duration (4 days) of symptoms was not in line with his examination and laboratory findings. His CT scan confirmed the presence of omental torsion and excluded acute appendicitis and other pathologies. Therefore, we opted to start with a trial of a non-operative approach with a low threshold to perform laparoscopic resection. We elected to administer wide-spectrum antibiotics (ciprofloxacin and metronidazole) to cover possible pathogens that may cause abscess. The close follow-up, by serial examination and laboratory works, was crucial to early pick up any signs of sepsis. Fortunately, he responded well and promptly to the non-operative management and was discharged within 1 week.

4 | CONCLUSION

Primary omental torsion is rare and should be considered in the differential diagnoses of acute abdomen in obese patients with inconsistent history, examination, and laboratory findings. High index of suspicion is important for preoperative diagnosis. The liberal use of CT represents a cornerstone for its preoperative diagnosis. Despite the controversy, the non-operative approach, which depends on accurate radiological diagnosis, analgesia, prophylactic antibiotics, and close follow-up, is a valid judicious modality of management and should be attempted as a first line of

TABLE 1 Literature review of all adult cases with a diagnosis of omental torsion or omental infarction that were managed non-operatively

Year	Author	No of reported cases	Age/gender	Obesity	Presentation	Duration	Temp	SIGNS
1992	Puylaert ^{14†}	7	10–77 5 m–2 f	NA	Right sided abdominal pain	1–6 days	NA	NA
1998	Karak ^{15a}	1	50/m	NA	RLQ pain	18 h	NA	RLQ tenderness
1999	van Breda Vriesman ^{16†}	11	6–76 Y	7 patients	DAP	0–14 days	NA	Localized tenderness
2002	Perello ¹⁷	6	38/m 38/m 34/m 25/f 50/f 23/m	NA	DAP DAP RF and RUQ pain RF pain DAP RF pain	36 h 48 h 72 h 72 h 12 h 18 h	NA	NA
2003	Xavier ¹⁸	1	30/m	NA	Inguinal hernia	NA	NA	NA
2003	Paroz ¹⁹	3	59/m 34/f 34/m	NA	RLQ and RF pain RLQ pain LUQ pain	NA	N N ++	Tenderness Unremarkable Tenderness
2004	Coulier ²⁰	1	51/f	NA	Epigastric pain	NA	NA	RT over epigastrium
2004	Abadir ^{21b†}	8	11–58	7 patients	RUQ pain 20% LLQ pain 47% RLQ pain 33%	3–96 h	N 93%	Peritonitis 40%
2004	Bachar ²²	5	31/f 75/m 79/f 27/f 31/f	NA	RLQ pain DAP RLQ pain RLQ pain RLQ pain	5 days 2 days 2 days 2 days 1 day	N	NA
2006	Goh ²³	1	39/m	NA	RUQ pain	48 h	38.2	Tenderness at RUQ, + murphy sign
2007	Rao ²⁴	1	29/m	+	RUQ pain	48 h	N	Tenderness over RUQ
2010	Fernández-Rey ²⁵	1	43/m	+	RF pain	48 h	N	Peritoneal irritation at RF
2010	Soobrah ¹	1	20/f	NA	RUQ pain	1 week	N	Tnederness over RUQ
2010	Tandon ²⁶	1	41/m	NA	RLQ pain	120 h	37.9	Unremarkable
2011	Modagheh ²⁷	1	74/f	NA	DAP	96 h	N	RT at RUQ, ill defined fullness
2012	Park ²⁸	3	56/m 52/m 52/m	NA	RLQ pain Epigastric pain LF pain	72 h 48 h 24 h	N N N	Tenderness RLQ Tenderness epigastrium and RUQ RT at LF, LLQ
2012	Filho ²⁹	1	36/f	-	DAP and constipation	5 days	N	Generalized peritonitis

WBCs	Inflammatory markers	Initial diagnosis	Imaging modalities	OT/OI	Antibiotics	LoS (days)	Fate	Follow-up	FU imaging
7.6–12	+++	Acute appendicitis	US, CT	OT vs OI	-	8–20	Improve	18–44 months	US
NA	NA	Acute appendicitis, underwent open appendectomy. The appendix was normal	Postop CT	OI	NA	NA	Improve	6 weeks	CT
5.3 ± 14.8	+	NA	US CT	OI	-	6–122	Improve	24 months	US
NA	NA	NA	CT	OT/OI	NA	4 days 4 days 4 days 3 days 7 days 2 days	Improve	2 months	US/CT
NA	NA	NA	CT	OT	NA	NA	NA	NA	NA
N	+++ +++ +++	NA	CT	OI OI OI	NA	3–7 days	Improve	NA	NA
N	+++	NA	US CT	OI	NA	NA	Improve	3 weeks	US
+++ 33%	NA	NA	CT	OI	+++ 60%	1–8 days	Improve	NA	NA
N N N +++ +++	NA	Acute appendicitis	US CT	OI	-	1–6 days	Improve	3–24 months	NA
+++	NA	Acute cholecystitis	CT	OI	+	3 days	Improve	1 month	NA
N	NA	NA	CT	OI	-	1 day	Improve	NA	NA
N	NA	Acute diverticulitis	US CT	OI	NA	NA	Improve	NA	Resolution of images
+++	+++	NA	CT	OI	-	3 days	Improve	NA	NA
+++	NA	Acute appendicitis	CT	OT	+	NA	Improve	NA	NA
N	NA	NA	US CT	OT	+	9 days	Improve	6 months	no
N N	Elevated Elevated	NA	CT	OI	NA -	5 days 1 day	Improve	NA 3 days	NA
N	+++	NA	CT	OI	NA	7 days	NA	NA	NA
+++	NA	NA	CT	OI	-	NA	Recurred pain after few days and conservative management continued. He eventually improved.	1 week	CT

(Continues)

TABLE 1 (Continued)

Year	Author	No of reported cases	Age/gender	Obesity	Presentation	Duration	Temp	SIGNS
2015	Rebeca Amo-Alonso ³⁰	1	65/f	NA	RUQ pain	NA	38°C	Painful mass, 10 cm, RUQ
2018	Udechukwu ³¹	1	61/m	+	RUQ pain	96 h	N	Tenderness over RUQ
2019	Kataoka ²	1	50/m	-	RLQ pain	12 h	NA	Unremarkable

Abbreviations: +++, elevated; CT, abdominal computed tomography; DAP, diffuse abdominal pain; LF, left flank; LLQ, left lower quadrant; LUQ, left upper quadrant; N, normal; NA, not available; OI, omental infarction; OT, omental torsion; RF, right flank; RLQ, right lower quadrant; RT, rebound tenderness; RUQ, right upper quadrant; US, ultrasonography of the abdomen.

^a This reported case was diagnosed as acute appendicitis and underwent open appendectomy. However, the appendix was normal macroscopically and microscopically. Postoperative CT confirmed diagnosis of OI.

^b This case series included 15 patients (eight OI and seven epiploic appendagitis), but the authors included a table for clinical data of all patients without differentiation between the two pathologies.

^c In this case, all symptoms were improved. However, laparoscopic omentectomy was performed due to persistent elevated inflammatory markers and worsening of the CT findings.

[†] All articles discussing pediatric cases were excluded. However, these three cases series included pediatric patients and were difficult to exclude these cases in particular.

management even in young healthy patients. Laparoscopic resection should be only considered after failure of non-operative management.

ACKNOWLEDGMENT

A written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal on request.

CONFLICT OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

MF involved in conceptualization and writing. MS and ZA involved in writing—original draft. OA and BA collected the data. HK involved in supervision, conceptualization, and writing—review and editing.

ETHICAL APPROVAL


Case reports are exempted from ethical approval.

DATA AVAILABILITY STATEMENT

Further details of the presented case is available from the corresponding upon reasonable request.

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WBCs	Inflammatory markers	Initial diagnosis	Imaging modalities	OT/OI	Antibiotics	LoS (days)	Fate	Follow-up	FU imaging
+++	+++	Ascending colon tumor	CT	OT/OI	NA	7 days	Improve	3 months	CT after 15 days
N	N	NA	CT	OI	-	NA	Improve	3 weeks	CT
N	+++	NA	CT	OT	+	5 days preop 9 days postop	Improved symptoms	NA	NA

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How to cite this article: Foula MS, Sharroufna M, Alshammasi ZH, Alothman OS, Almusailh BA, Hassan KA. Non-operative management of primary omental torsion, a case report and literature review. *Clin Case Rep.* 2021;9:e04474. <https://doi.org/10.1002/ccr3.4474>