

Omental torsion at the time of COVID-19 in Northern Italy: a case report of conservative management with a review of the pertinent literature

Filippo Montali^{1,2}, Cristina Presicci³, Carlotta Sartorio³, Edoardo Virgilio³, Massimo Pedrazzini³, Renato Costi³

¹Department of Surgery, Azienda Sanitaria Locale di Parma, Vaio Hospital, Fidenza (PR), Italy; ²Department of Transplant Surgery, Wake Forest University, Winston-Salem, USA; ³Department of Radiology, Azienda Sanitaria Locale di Parma, Vaio Hospital, Fidenza (PR), Italy

Abstract. *Background and aim:* In middle-aged men, omental torsion (OT) can be a cause of acute abdomen. The right side of the omentum is longer, heavier and more mobile than the left one and, as a consequence, it can twist more easily on its vascular axis. Consequently, OT localization in the lower right quadrant is more frequent, and therefore it can mimic acute appendicitis clinical onset. In most cases, OT is defined as “primary” in the absence of any other underlying pathologies, or, rarely, “secondary”, when caused by other intra-abdominal diseases such as inguinal hernia, tumors, cysts or post-surgical scarring. To date, clinical diagnosis of OT still remains a challenging one in a preoperative setting and most cases are diagnosed intraoperatively. If diagnosis is correctly achieved preoperatively by adequate imaging examinations, most patients presenting with OT do not undergo surgery anymore. Such considerations gain importance at the time of COVID 19 pandemic, where a conservative management and an early discharge may be preferred owing to in-hospital morbidity after abdominal surgery whenever surgery may be avoided. *Methods and Results:* We present a case of an OT successfully treated in a non-operative manner during COVID-19 outbreak in Northern Italy and offer a review of the literature that supports such a clinical attitude. *Conclusions:* OT preoperative diagnosis is challenging and is usually achieved by abdominal CT-scan. The suggested OT initial management is conservative, leaving a surgical approach, preferably by laparoscopy, for the 15% of cases not improving with a non-surgical approach. (www.actabiomedica.it)

Key words: Omental Torsion, COVID-19, Conservative management, Pandemic outbreak

Introduction

Although studied since 1899 (1), as of 2021 obtaining a diagnosis of OT still remains a laborious task: 90% of the cases (more than 400) reported in the literature, in fact, are diagnosed only intraoperatively (2,3). Men between 30 and 50 years are most frequently affected (4). The greater omentum is a very mobile two

layered fold of peritoneum and it has no attachments except on its superior part which is connected to the greater curvature of the stomach. Since the right side of the omentum is longer, heavier and more mobile than the left one, it can more easily twist on its vascular axis, in particular around and distally to the right epiploic artery. As a consequence, OT more frequently presents with right abdominal localization.

From a physiopathological point of view, OT generally occurs as a volvulus on its long axis initially causing venous congestion and edema, causing hemorrhagic infarction and finally omental necrosis. OT can be primary (idiopathic) or secondary. Concerning the idiopathic forms, several predisposing conditions have been found: obesity with accumulation of omental fat, bifid or accessory omentum, narrow omental pedicle, venous redundancy and finally a sudden change in body position or local trauma that increase the intrabdominal pressure. Secondary torsion, on the other hand, is associated with other diseases creating a point of intrabdominal anchorage for omentum like hernias (inguinal, internal or external hernias), tumors, cysts, foci of intra-abdominal inflammation, postsurgical wounds or scarring.

OT management has evolved during last decades and is mostly non-surgical when diagnosed preoperatively. In fact, OT naturally runs a benign course reducing spontaneously and evolving with a simple fibrosis; more rarely, a omental necrosis may occur and lead to an abdominal abscess formation.

Case Report

A 67-year-old man with type II diabetes and arterial hypertension and no history of previous abdominal surgery presented to our Emergency Department with an increasing pain at his right iliac fossa lasting 48 hours. He was afebrile with stable vitals but also reported a single episode of vomiting the night before admission and constipation since 24 hours. The patient was initially screened for COVID-19; pending the result of the exam, as a common practice, he was considered potentially positive. Physical examination revealed abdominal distension and right iliac fossa pain with no signs of undergoing acute peritonitis (no guarding, no rebound tenderness – negative *Blumberg sign*); there was no evidence of hernias but abdominal palpation elicited a mass in the right upper quadrant. Laboratory investigations showed leukocytosis ($14,000/\text{mm}^3$) with increased reactive C protein level (150 mg/L). Ultrasounds (US) showed a normal appendix, gallbladder stones and a pericolic collection in the right abdomen. CT scan showed a mesenteric knot

was observed in the abdominal right region side including an enhanced vessel and extensive hyperdense streaks in right iliac region mesenteric fat, and perivesical and perirectal fat, allowing OT diagnosis to be achieved (Fig. 1 and 2).

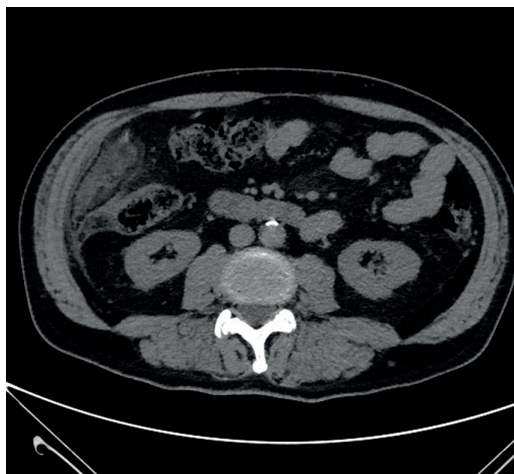


Figure 1. Axial image of baseline unenhanced CT shows oval thickening of fat tissue in the right lumbar region associated with surrounding omental stranding and periferic spontaneously hyperdense vascular structure (white arrow).

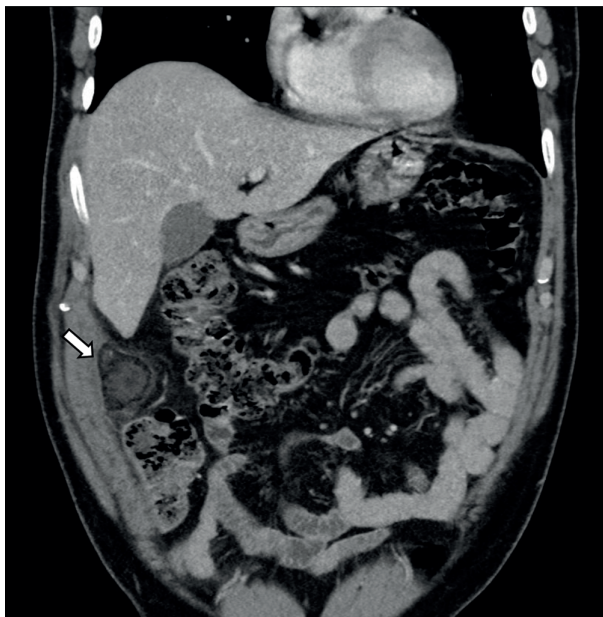


Figure 2. Coronal image of baseline enhanced CT (portal phase) shows a mass of soft tissue attenuation in the right lumbar region surrounded by omental stranding and with a pattern of concentric streaks (white arrow).

As molecular COVID 19 swab resulted negative, the patient was admitted to the surgical department and administered total parenteral nutrition, empiric antimicrobial therapy, non-steroidal anti-inflammatory drugs and analgesics. Twenty-four hours after admission the abdominal pain disappeared and the patient remained clinically stable for the rest of hospitalization. In order to exclude a secondary form of omental torsion a pancolonoscopy, which resulted negative except for sigmoid colon non complicated diverticular disease of the. After 72 hours a control abdominal CT scan documented resolution of the former radiologic findings. The patients was discharged 7 days after admission and is doing well at 1-month follow-up.

Discussion

From winter 2020, the COVID-19 outbreak dramatically spread worldwide. The first person-to-person transmission in Northern Italy was confirmed on February 21, 2020; since then, over 3,81 million infected people died worldwide and 127.000 fatalities occurred in Italy by June 15, 2020. The number of cases and deaths in Northern Italian Hospitals became rapidly overwhelming, and healthcare system and general practitioners had to face the medical, practical and ethical challenge of managing COVID-19 patients.

In this context, resources usually destined to surgical activity (anesthesiologists, ICU beds, ventilators) were reallocated. Such a complex scenario impacted on surgical activity, redefining the significance of emergency or undeferrable surgical procedures. The retrospective study by Ceresoli et al. showed how the COVID-19 pandemic happened during the lockdown period between March and April 2020 prompted surgical departments to adopt a more conservative clinical attitude even in the case of common conditions usually managed surgically, such as acute appendicitis (5). In such a changed perspective, the timely diagnosis of a condition causing acute abdomen but non necessarily requiring surgical management, may have the double advantage of not using resources usually destined to surgery but now needed elsewhere and,

avoiding surgical exploration, allowing for patient's rapid discharge.

OT is commonly considered a rare pathology, but it is not a unique finding in surgery units or in the operating theater, as witnessed by more than 400 cases of OT are reported in recent literature. OT raises two issues, with potential effects on its management: on one hand, how to achieve a diagnosis, which is rarely made preoperatively (or non-operative), on the other, the most appropriate management, as omental resection is usually preferred if diagnosis is made intraoperatively, but it is normally conservative care (and no surgery) in the case diagnosis is achieved preoperatively (Table I).

Most patients present with aspecific manifestations such as localized abdominal pain, fever, constipation and moderate leukocytosis. These findings, in fact, can be related to other more common causes of acute abdomen such as acute appendicitis or cholecystitis. US is useful as first diagnostic approach but has limited sensitivity due to its operator-dependent nature and the overlying bowel gas. In our case, US was useful to exclude other common pathologies visualizing a normal appendix and a non-complicated lithiasic gallbladder. When viewble on US, OT usually appears as a focal area of increased echogenicity in the omental fat, corresponding to the site of major tenderness. As for other conditions causing acute abdomen symptoms, CT scan is pivotal in order to perform a correct diagnostic and therapeutic work-up. Several authors, in fact, emphasized the role of CT as a first step to gain a completely conservative strategy; interestingly, others excluded from meta-analysis the cases undiagnosed with preoperative CT scan (6). CT signs of OT could be aspecific in many cases, and therefore challenging, since it frequently shows as a fat-density area in the right paraumbilical or right lower quadrant surrounded by radial soft-tissue stranding (signs of omental infarction). Swirling of omental vessels, a more specific sign of OT, could be detected, thus facilitating diagnosis.

Until COVID-19 pandemia spread, the indication to surgical management of OT was largely debated (7), as it was considered a non-infectious, usually self-limiting inflammatory disease, but potentially complicating by the onset post-necrotic bacterial abscess. In

Table 1. Successful non-operative management cases of omental torsion reported in literature

Author	Year	Gender	Age	Duration of symptoms
Alzahrani et al	2018	F	50	24 h
Coulier	2018	M	76	n/a
Alshehri et al.	2018	M	46	n/a
Udechukwu et al.	2018	M	61	92 h
Ong et al.	2018	M	27	Acute
Criado-Martin et al.	2018	M	86	24 h
Choh	2017	M (2 pt) F	(28-50)	n/a
Snachez-López-Gay et al	2017	M	72	2 h
Mayoral-López et al.	2017	F	25	72 h
Suresh et al.	2017	M	24	96 h
Dutkiewicz et al.	2016	M	37	72 h
Amo-Alonso et al.	2015	F	65	n/a
Ravindradas et al.	2015	M	53	72 h
Aiyappan et al.	2015	M	30	Acute
Abbas et al.	2015	F	38	48 h
Sanchez-Fuentes et al.	2015	M (1 pt) F	49-59	n/a
Wang et al.	2013	M	49	Acute
George et al	2013	M	27	Acute
Schmidt et al.	2013	M	61	72 h
Bouilland et al.	2012	M	28	24 h
Park et al.	2012	4 pt: M (4)	52-57	2 h- 72 h
Khouli et al.	2012	F	67	72 h
Ishimaru et al	2012	F	75	48 h
Kerr et al.	2012	1 pt: M (2) F	57-74	n/a
Araújo-Filho et al	2012	F	36	5 days
Park et al	2011	F	65	n/a
Bersou et al.	2011	M	25	n/a
Kim et al.	2011	F	30	72 h
Barai et al	2011	M	32	24 h
Modaghegh et al.	2011	F	74	96
Soobrah et al	2010	F	20	7 days
Le Moigne et al.	2010	F	52	48 h
Tandon et al	2010	M	41	96 h
Fernández-Rey.	2010	M	43	48 h
Yoon et al.	2009	F	51	72 h
Bessoud et al.	2008	F	70	3 weeks
Auguste et al.	2008	F	56	Acute
Rao et al	2007	M	28	48 h
Sammour et al.	2007	2 pt: M (2)	26-32	18 h - 92 h
Lapsia et al	2007	M	38	Acute
Coulier	2006	F	72	n/a
Goh et al.	2006	M	39	48 h
Bachar et al.	2005	1 pt: M (2) F	27-79	24 h - 5 days
Coulier et al.	2004	F	51	n/a

a large meta-analysis, Medina Gallardo et al. analyzed 146 cases formerly described in the literature of which 106 underwent a conservative treatment with a success rate of 84.1%. The authors found that the following were associated with conservative treatment failure: young age, white blood cell count ≥ 12000 , worsening pain or increasing temperature compared to the ones recorded on admission (7).

Soobrah et al. published a review of literature including 64 patients (both children and adults) who were managed conservatively; the failure rate was of 15.6% due to omental flap necrosis, subsequently treated with laparoscopic resection (8). In a case series article, Kerr et al. described symptomatic and asymptomatic cases of secondary OT following colonic resection, diagnosed by CT: all the patients were treated successfully with a conservative approach (9). Bachar et al. described 6 cases where only one patient needed surgery due to persistent abdominal pain (10). Agarwal (11) and Chauhan (12) described an abscess formation after OT conservative management, finally suggesting a closed radiological and clinical follow-up. In the case a conservative attitude for non-complicated OT is adopted, in our opinion, any possible cause of secondary OT should be ruled out, namely colon cancer: in the reported case pancolonscopy was performed after 48 hours. When conservative treatment fails and acute peritonitis' symptoms/signs or laboratory findings persist or worsen, or diagnosis is unclear, surgical exploration is needed. In this case, the recommended approach is laparoscopy (13). Costi et al. showed the laparoscopic resection of the greater omentum an effective and easy task even for inexperienced laparoscopic surgeons (13).

Conclusions

OT preoperative diagnosis is challenging and is usually achieved by abdominal CT-scan. The suggested OT initial management is conservative, leaving a surgical approach, preferably by laparoscopy, for the 15% of cases not improving with a non-surgical approach.

Such an attitude is more and more recommended at the time of the COVID 19 pandemic, where it seems more appropriate to save resources usually involved in operating theaters for conditions otherwise eligible for conservative treatment, including OT.

Conflict of interest: Each author declares that she or he has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

References

1. Eitel G.G. Rare omental torsion. *NY Med Rec.* 1899;55:715–716.
2. Charieg A., Ben Ahmed Y., Noura F. A diagnosis to keep in mind: primary omental torsion in children. *EC Paediatrics.* 2016;2:245–249.
3. López-Rubio M.A., Martínez-Ruiz Y. Una causa infrecuente de dolor abdominal: el infarto de omento. *Rev Clin Med Fam.* 2011;4:254–255
4. Vagholkar K., Chougale Q., Agrawal P. Omental torsion: a rare cause of acute abdomen. *Int. Surg. J.* 2016;3:1711–1713
5. Ceresoli M, Coccolini F and the Appendicitis-COVID study group The decrease of non-complicated acute appendicitis and the negative appendectomy rate during pandemic *Eur J Trauma Emerg Surg* 2021 Apr 12;1-7. Online ahead of print.
6. Miguel Perelló J., Aguayo Albasini J.L., Soria Aledo V. Torsión de epiplón: las técnicas de imagen pueden evitar intervenciones innecesarias. *Gastroenterol. Hepatol.* 2002;25(8):493–496.
7. N.A. Medina-Gallardo N.A., Y. Curbelo-Peña, T. Stickar, et al. Omental infarction: surgical or conservative treatment? A case reports and case series systematic review *Ann Med Surg (Lond)* 2020 Jun 27;56:186-193.
8. Soobrah R., Badran M., Smith S.G. Conservative management of segmental infarction of the greater omentum : a case report and review of literature. *Case Rep Med.* 2010;2010:1–4.
9. Kerr S.F., Hyland R., Rowbotham E. Postoperative omental infarction following colonic resection. *Clin. Radiol.* 2012;67:134–13911.
10. Bachar G.N., Shafir G., Postnikov V. Sonographic diagnosis of right segmental omental infarction. *J. Clin. Ultrasound.* 2005;33(2):76–79

11. Agarwal S., Shaikh A., Navare M.S. Primary omental infarction presenting as a parietal wall swelling: a rare case report. *J Med Sci Clin Res.* 2015;7267-7270. 03(08)
12. Chauhan V., Stephenson J.A., Shah V. Intra-abdominal focal fat infarction of the omentum: diagnosis and percutaneous management. *Br J Radiol Case Reports.* 2015
13. Costi R, Cecchini S, Randone B et al. Laparoscopic diagnosis and treatment of primary torsion of the greater omentum. *L.Surg Laparosc Endosc Percutan Tech.* 2008 Feb;18(1):102-5. doi: 10.1097/SLE.0b013e3181576902. PMID: 182879

Correspondence

Received: 20 May 2021

Accepted: 17 June 2021

Filippo Montali, M.D.

Department of Surgery

Azienda Sanitaria Locale di Parma

Vaio Hospital ,Via Don Tincati 5, 43036 Fidenza (PR)

and

Department of Transplant Surgery, Wake Forest University,

391 Technology Way, Winston-Salem, NC 27101, USA