

Omental Torsion Triggered by Abdominal Massage in Acute Appendicitis: A Case Report

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Abstract

Background: Omental torsion is a rare condition that can cause acute abdominal pain similar to appendicitis, making preoperative diagnosis difficult. Abdominal massage, although commonly used as a complementary therapy to relieve pain and digestive disorders, has the potential to increase intra-abdominal pressure, which can trigger serious complications, including omental torsion.

Case description: A 29-year-old man came to the surgical clinic of the Yogyakarta Hospital with 18 hours of abdominal pain that began in the upper abdomen and then moved to the right lower quadrant, with a history of self-administered abdominal massage. The patient underwent emergency laparoscopy, which revealed a hyperemic appendix and a twisted and necrotic greater omentum. Laparoscopic appendectomy and omentectomy were performed. Anatomic pathology confirmed the diagnosis of acute appendicitis and omental torsion. This simultaneous occurrence is rarely reported and poses clinical and radiological diagnostic challenges.

Conclusion: This study highlights the potential risk of intense abdominal massage as a trigger for omental torsion, especially in individuals with anatomical predispositions such as obesity or intra-abdominal adhesions. Therefore, caution is required when performing abdominal massage, particularly in patients with acute abdominal pain. Early treatment through laparoscopy provides a definitive diagnosis and adequate therapy, avoiding life-threatening complications. This study adds insight into the potential interaction between massage therapy and omental complications, as well as the need for public and medical education regarding the risks of abdominal massage in conditions of intra-abdominal inflammation.

Keywords: abdominal massage, omental torsion, appendicitis

Introduction

The omentum is a layer of fat that covers the organs in the abdominal cavity and plays an important role in maintaining local homeostasis and inflammatory responses¹¹. Omental torsion is a rare condition in which the omentum twists, causing blood flow disruption and tissue necrosis²⁰. In some cases, the triggering factors for this torsion are not fully understood, but some reports point to external manipulation such as abdominal massage as a potential trigger³. Acute appendicitis is an inflammatory condition of the appendix that often requires surgical intervention; the role of abdominal massage has not been studied in depth scientifically¹⁶. Studies on the relationship between abdominal massage and the occurrence of omental torsion are still very limited, making it a scientific limitation in the management of acute abdominal pain.

This case report highlights the importance of caution in massage, especially abdominal massage. Abdominal massage is widely used as a complementary therapy in various abdominal conditions, including to relieve pain or improve intestinal motility. However, no studies have specifically investigated the potential effects of abdominal massage in triggering complications such as omental torsion in patients with acute appendicitis. This case report may contribute to the development of safer and more effective clinical protocols for patients with acute abdominal pain inflammatory conditions, particularly appendicitis.

The main objective of this case report is to identify and describe the potential

role of abdominal massage in triggering omental torsion in patients with acute appendicitis through a case study, as well as to examine the clinical implications of these findings. This study emphasizes the importance of vigilance regarding alternative therapies performed by patients or families without strict medical supervision, especially in sensitive acute inflammatory conditions. Therefore, this study is expected to pave the way for further research involving cohort or prospective studies to determine the causal relationship and complete mechanism of omental torsion associated with abdominal massage, which may ultimately improve the quality of medical services and patient safety.

Case Description

A 29-year-old man came to the surgical clinic of the Yogyakarta Hospital complaining of abdominal pain for 18 hours prior to admission. The pain was constant, felt like being pulled upward, with a Visual Analog Score (VAS) of 8. The pain initially felt in the upper abdomen, but then gradually moved to the lower right abdomen. Previously, the patient had visited the Emergency Department (ED) of the Yogyakarta Regional General Hospital, where he was given stomach medication and pain relievers because he had a history of acid reflux. The patient then assumed that the pain was coming from his stomach, so he massaged his abdomen with an up-and-down motion for 1 hour. The patient had a habit of massaging his abdomen when he experienced abdominal pain. The pain worsened when changing positions, such as sitting, standing, and walking. The patient consumed alcohol but had not smoked for 3 years. The patient had no significant history of comorbidities and no history of previous surgical interventions. A history of diabetes mellitus, hypertension, and asthma was denied. A history of narcotics and addictive substance use was denied.

Physical examination revealed *compos mentis* consciousness, a Body Mass Index (BMI) of 24.51 with normal nutritional status, vital signs of blood pressure 123/101 mmHg, heart rate 87 beats per minute, respiratory rate 20 breaths per minute, and body temperature 36.5° Celsius. Examination of the head, neck, chest, and extremities showed no abnormalities. On abdominal examination, tenderness was found in the lower right abdomen (at McBurney's point) and rebound tenderness was present. The patient was scheduled for laparoscopy to address these complaints.

Laboratory test results show that several hematology and coagulation

parameters are within normal limits, but there are some elevated results. Red blood cells (erythrocytes), hemoglobin, and hematocrit are still within the normal range, indicating relatively good blood condition without significant anemia. However, the Mean Corpuscular Volume (MCV) is slightly below normal, which may indicate the presence of smaller-than-normal red blood cells, potentially indicating microcytic anemia or iron deficiency. The leukocyte differential count shows a lower-than-normal percentage of lymphocytes, while monocytes are slightly elevated, which may indicate an immune response to infection or mild inflammation. The absolute eosinophil count is also elevated, which may reflect an allergic reaction or parasitic infection. Coagulation tests such as Prothrombin Time (PT), International Normalized Ratio (INR), and Activated Partial Thromboplastin Time (APTT) are within the normal range, indicating good blood clotting function. Random blood sugar is also within normal limits, indicating good blood sugar control. Overall, these results indicate generally good hematological and coagulation function.

Table 1. Laboratory test results

Type of examination	Normal range	Result	Unit	Conclusion
Routine blood				
Eritrocyt	4.50-5.90	5.69	10e6/ul	Normal
Hemoglobin	12.3-17.5	15.4	g/dl	Normal
Hematokrit	40.0-52.00	44.9	%	Normal
Mean Corpuscular Volume	80-96	78.9	fl	Low
Mean Cospucular Hemoglobin Concentration	33-36	34.4	Gr/dl	Normal
Count the types of leukocytes				
Neutrofil%	50-70	65.0	%	Normal
Lymfosit%	25-60	23.5	%	Low
Monosit%	2-8	8.5	%	High
Eosinofil%	2.0-4.0	2.8	%	Normal
Basofil%	0-1	0.2	%	Normal
Neutrofil#	2-7	6.73	Thousand/ul	Normal
Lymfosit#	0.8-4	2.43	Thousand/ul	Normal
Monosit#	0.12-1.2	0.88	Thousand/ul	Normal
Eosinofil#	0.02-0.05	0.29	Thousand/ul	High
Basofil#	0-1	0.02	Thousand/ul	Normal
Coagulation				
Prothrombin Time (PT)	11.3-14.6	12.4	Second	Normal
Control Normal PT	11.3-16.2	13.5	Second	Normal
International Normalized Ratio (INR)	0.8-1.2	0.94	-	Normal
Activated Partial	26.8-36.3	30.0	Second	Normal

Thromboplastin Time (APTT)				
Control Normal APTT	26.9-38.7	37.1	Second	Normal
Blood sugar level	70-140	112	Mg/dl	Normal

After laboratory blood tests were performed, the patient underwent laparoscopy, which revealed a hyperemic appendix with increased vascularization, followed by appendectomy. After appendectomy, exploratory laparoscopy was performed to confirm other complaints. A twisted and necrotic greater omentum was also found. A laparotomy was performed to remove the necrotic part of the greater omentum. Adhesions around the necrotic lesion were removed.



Figure 1. The patient underwent laparoscopic surgery.

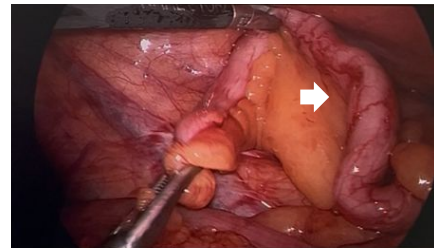


Figure 2. Appendicitis vermiformis hiperemis

Specimens were obtained through a small abdominal incision, and samples of vermiform appendix and greater omentum tissue were examined in the anatomical pathology laboratory. Based on the results of the anatomical pathology laboratory examination, the omentum specimen was fragmented with a volume of +/- 500 cc. The largest fragment was sheet-shaped, measuring 11.5 x 4.5 x 1.5 cm, while the smallest was 0.5 cm in diameter. It was whitish brown in color, with some blackened areas. The examination revealed a 3.5 x 2.5 x 1.5 cm thickening that was whitish brown in color, partially blackened, with 3 imprinted fragments. The appendix was 5.5 cm long and 0.7 cm in diameter, whitish brown in color, and elastic. The examination revealed no perforation holes, with 3 imprinted fragments. The omentum tissue specimen showed fatty tissue and connective tissue with dilated blood vessels, erythrocyte extravasation, and hemorrhage, while the appendix tissue showed a lumen containing an amorphous mass, erythrocytes, and inflammatory cells. The mucosal epithelium was partially

eroded to ulceration, without atrophy or dysplasia. The lamina propria was swollen and filled with lymphocytes, histiocytes, plasma cells, and neutrophils. Several lymphoid follicles were also found. The tunica muscularis and periappendicular fatty tissue showed dilated blood vessels, erythrocyte extravasation, and lymphocytes. No signs of malignancy were found.

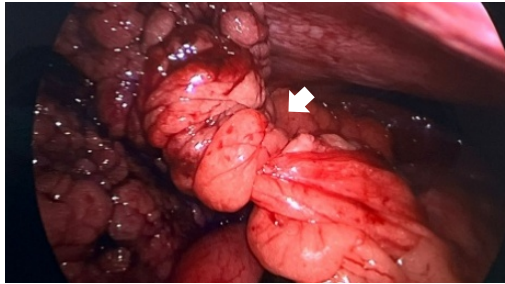


Figure 3. Twisted greater omentum

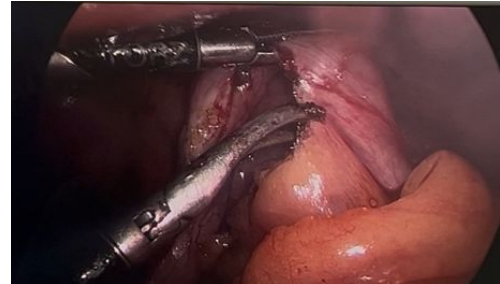


Figure 4. Appendectomy

Based on the results of the medical history, physical examination, and supporting tests, the patient was diagnosed with acute appendicitis and omental torsion. The patient underwent emergency laparoscopy to treat the symptoms. After the operation, the patient was treated in the Dahlia room. The next day, the patient was allowed to go home and continue wound care at the surgical clinic for the next week.



Figure 5. Major omental necrosis



Figure 6. Major omentum and vermiform appendix preparation

Discussion

Acute appendicitis remains one of the most common causes of emergency surgery in Indonesia. Based on data from the Global Burden of Disease (GBD) 2019, the incidence rate of acute appendicitis in Indonesia is estimated to be around 92.5 per 100,000 population with an uncertainty range of 68.7–121.8. This figure is relatively

stable compared to other Southeast Asian countries⁸. Global trends from 1990 to 2019 also show an increase in the incidence of appendicitis in many countries, including Indonesia, although regional variations are quite large⁹.

Hospital-based research in Indonesia shows that the most commonly affected age group is adolescents and young adults, with a higher incidence in males than females. A study at PKU Muhammadiyah Bantul Hospital¹⁴ (2022 data) shows that appendicitis is the most common abdominal surgical diagnosis, with the most common complication being perforation in cases that arrive late¹⁴. Other reports from several surgical centers in Central Java and East Java also confirm a similar pattern: the majority of patients are aged 15–30 years, most come with complaints of right lower quadrant pain, and the complication rate increases with delayed diagnosis¹⁶. Therefore, epidemiologically, acute appendicitis in Indonesia remains one of the leading causes of emergency abdominal pain, primarily affecting the productive age group, with the main challenges being early diagnosis and prevention of complications.

Abdominal massage therapy is widely recognized as a complementary method to help relieve abdominal pain, bloating, and discomfort caused by digestive disorders¹⁷. Several studies and clinical reviews show that gentle massage of the abdominal area can improve intestinal peristalsis, aid in the release of gas, and relieve constipation and pain associated with mild digestive disorders⁷. Massage applied to specific points is also known to have a relaxing effect that helps reduce abdominal muscle tension¹⁷.

To date, there is no direct evidence linking massage therapy to the occurrence of omental torsion. However, it is important to consider the potential risks of intensive abdominal massage. A case report by Sun²¹ *et al.* (2022) showed serious complications in the form of pancreatic injury and massive intra-abdominal bleeding after a patient received intensive abdominal massage, indicating that any action that increases intra-abdominal pressure has the potential to cause damage to internal organs²¹. These findings serve as an analogy that intensive massage has the potential to trigger a similar mechanism in omental torsion.

If performed incorrectly or with excessive pressure, abdominal massage can cause a number of serious complications. One rare but dangerous complication that has been reported is omental torsion, a condition in which the omentum (the fatty tissue covering the abdominal organs) twists, causing acute pain, ischemia, and even requiring

surgery. In addition to omental torsion, other complications that can occur due to improper abdominal massage include internal bleeding, tears in internal organs (such as the pancreas or intestines), organ adhesions, peritonitis, and intraperitoneal abscesses.

Theoretically, increased intra-abdominal pressure due to deep abdominal massage can be one of the factors that trigger omental torsion. This mechanical pressure has the potential to trigger displacement or rotation of the omentum, especially if there are predisposing factors such as obesity or congenital anatomical abnormalities that make the omentum more susceptible to rotating on its axis⁴. In addition, pre-existing conditions such as omental cysts, hernias, or intra-abdominal adhesions can also increase susceptibility to torsion. In individuals with these conditions, strong or repeated abdominal manipulation, including intensive massage, can theoretically increase the risk of omental torsion, causing acute abdominal pain¹⁵.

The pathophysiological mechanisms that occur during abdominal massage can increase omental mobility, especially if there are predisposing factors such as previous thickening or adhesions¹². In addition, the mechanical forces of massage manipulation can cause omental torsion around its axis, especially if there are predisposing conditions such as hernia or congenital anatomical abnormalities¹². This torsion can disrupt vascular flow in the omentum and cause the characteristic symptoms of omental torsion, namely acute abdominal pain resembling appendicitis².

Intensive abdominal massage has the potential to cause intra-abdominal trauma through the mechanism of sudden increases in intra-abdominal pressure. This mechanical pressure can cause injury to vulnerable organs, as reported by Sun *et al*²¹. (2022) that abdominal massage can cause isolated pancreatic injury accompanied by significant bleeding. A similar mechanism can affect the omentum, especially in individuals with anatomical predispositions such as excessive omental length, intra-abdominal adhesions, or mobility abnormalities. Sudden pressure increases can trigger omental torsion, causing venous and arterial flow obstruction, followed by edema, congestion, ischemia, and necrosis in the distal omental segment²⁰. Clinically, this condition is characterized by acute abdominal pain resembling acute appendicitis, making it difficult to distinguish before radiological examination or surgical exploration. Dias *et al*⁵. (2023) emphasize that omental torsion is one of the clinical entities that often mimics acute appendicitis, with abdominal CT scans showing

characteristic swirl patterns⁵. Additionally, although extremely rare, a combination of omental torsion and acute appendicitis can occur simultaneously in one patient, which is generally only identified through laparotomy¹⁵. Therefore, intense abdominal massage can act as a risk factor.

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Omental torsion is a rare condition, with an incidence reported at approximately 1:600 appendectomy cases over 20 years in Australia and 1:800 appendectomy cases over 30 years in the United States. Approximately 400 cases of primary omental torsion have been reported globally since it was first described by Eitel in 1899. The incidence in the pediatric population is relatively low, at approximately 0.1–0.5% of acute abdominal surgeries initially suspected to be appendicitis¹. Omental torsion is more common in adults aged 30–50 years and shows a male predominance¹². In children, the incidence increases with the rising prevalence of childhood obesity⁶. Most cases involve the right omentum, which is larger and more mobile than the left side¹. Additionally, the majority of cases are only discovered during surgery because they are difficult to diagnose clinically or radiologically before surgery¹⁸.

Omental torsion is difficult to diagnose because its symptoms are nonspecific and often resemble those of other acute abdominal diseases, such as appendicitis, diverticulitis, or cholecystitis. Clinical and laboratory examinations generally cannot distinguish it from other more common conditions, so the diagnosis is often only confirmed intraoperatively⁶. Radiological findings on ultrasound are often variable and nonspecific, while CT scans, although more sensitive, can only confirm the diagnosis in about two-thirds of cases¹. The presence of pain resembling appendicitis without typical symptoms such as nausea or vomiting further complicates the diagnosis¹⁰.

Physical examination findings that can be found in cases of omental torsion include a positive Carnett's sign. Carnett's sign is performed by pressing on the abdomen while the patient contracts the abdominal muscles by raising the head and shoulders. The Carnett sign is considered positive if there is increased pain, indicating abdominal wall pain. This sign is positive because the omentum undergoing torsion is attached to the anterior abdominal wall. Some patients show a positive Rovsing's sign and difficulty walking due to severe abdominal pain⁶. Not all patients experience gastrointestinal symptoms such as fever, nausea, or vomiting, so the clinical picture can be confusing¹¹. Abdominal pain in omental torsion may also worsen with movement or changes in body position, consistent with ischemic and inflammatory processes in the twisted omentum¹. Laboratory tests may show mild leukocytosis and elevated CRP, but these findings are nonspecific and cannot be used as a basis for a definitive diagnosis¹¹.

Cases of acute appendicitis occurring concurrently with omental torsion are very rarely reported. In the abdominal surgery literature, omental torsion alone accounts for only 0.0016%–0.37% of cases of acute abdominal pain initially suspected to be appendicitis⁴. Several case reports describe patients who presented with typical symptoms of appendicitis, but during surgery a combination of appendicitis and omental torsion was found¹³. In these reports, preoperative diagnosis is nearly impossible to establish, as the clinical symptoms of omental torsion often resemble appendicitis, and both conditions can only be confirmed after intraoperative exploration²².

Consent for Publication

Written informed consent was obtained from patient to publish this case report

Conclusion

Although abdominal massage can relieve pain, it can cause serious damage to internal organs. Omental torsion, a condition in which the omental folds twist and cause ischemia and severe pain, is one of the possible complications. In addition, improper abdominal massage can cause organ damage, intraperitoneal bleeding, organ adhesions, and infections such as peritonitis and abscesses.

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Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest

Author contribution

Syahriyatur Amaliyah (Conceptualization), Dzaka Ogan Amirudin Lutfi (Conceptualization, Literature Search), Raden Tri Gunawan Wibowo (Manuscript Preparation and Review), Nazwa Sheika Nabila and Muhammad Akmal Fauzi (Writing and Editing)

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