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Gastrointestinal

Computed tomography diagnosis of omental infarction presenting as an acute abdomen

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ABSTRACT

Omental infarction is a rare cause of acute abdominal pain. Without the support of radiological evidence, diagnosis is difficult to attain owing to its infrequent incidence, low awareness among clinicians, and its nonspecific presentation that mimics other causes of acute abdomen, namely, acute appendicitis and cholecystitis. Incorrect diagnosis may lead to unnecessary invasive surgery in patients with omental infarction, a disorder that is typically managed conservatively without exposing the patient to intraoperative risks and postoperative morbidity. We report a case of a 61-year-old man who presented to the emergency department with signs of peritonitis. He was eventually diagnosed with omental infarction through computed tomography of the abdomen. He was successfully managed medically with nonsteroidal anti-inflammatory and antiemetic medications, with complete resolution of his symptoms within 2 weeks.

Introduction

Omental infarction (OI) is a rare cause of acute abdomen and is challenging to diagnose owing to a low incidence, low awareness among clinicians, and nonspecific presentation. It presents with sudden-onset abdominal pain that is typically right-sided and is characterized by nausea, vomiting, low-grade fever, or a palpable abdominal mass. Although OI is commonly mistaken for other causes of acute abdomen particularly appendicitis and cholecystitis, its diagnosis is becoming more common with advancements in radiological technology in the past 20 years [1].

Case report

A 61-year-old obese man with a history of diverticulosis and no prior surgeries presented to the emergency department with right upper abdominal pain of 4 days. He reported lifting heavy furniture immediately preceding the onset of pain. The pain

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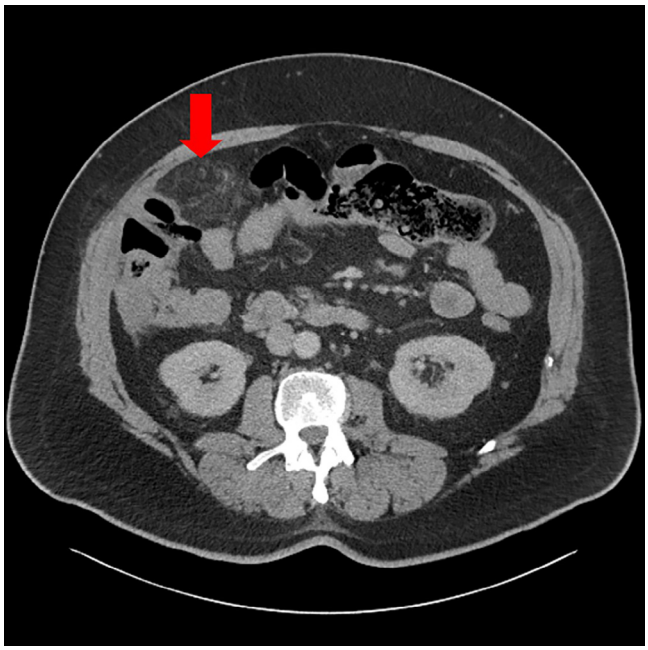

Fig. 1 – Axial view of CT abdomen and pelvis with contrast shows circumscribed area, 53.0 × 47.9 mm, with inflammation centered around the omental fat at the time of diagnosis. The red arrow points to the area of omental infarction. CT, computed tomography.

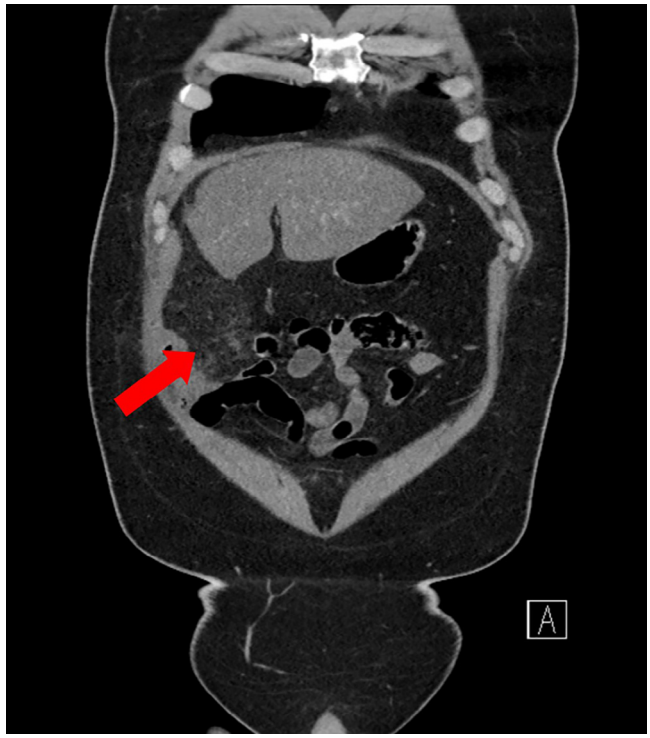

Fig. 2 – Coronal view of CT abdomen and pelvis with contrast shows circumscribed area, 53.0 × 47.9 mm, with inflammation centered around the omental fat at the time of diagnosis. The red arrow points to the area of omental infarction. CT, computed tomography.

progressively worsened in intensity, necessitating presentation to the hospital. The pain was aggravated by movement but did not improve with specific positions, ibuprofen, or naproxen. He reported nausea but denied vomiting, fever, chills, chest pain, palpitations, shortness of breath, bloating, diarrhea, constipation, inability to pass flatus, hematochezia, hematuria, or dysuria. Pain was unrelated to meal intake. On physical examination, he exhibited tenderness on light palpation localized to his right upper abdominal quadrant with guarding. He had no rebound tenderness or palpable masses and Murphy's sign was negative. Other systemic examination was unremarkable. Complete blood count, hepatic function tests, lipase, urinalysis, and lactate levels were within normal limits. Electrocardiogram showed normal sinus rhythm.

Given a clinical concern for an acute abdomen, a general surgery consult was placed. While awaiting surgical evaluation, the emergency department provider obtained computed tomography (CT) imaging to rule out other diagnoses. CT abdomen and pelvis with contrast showed a regional 53.0 × 47.9-mm area of inflammation centered within the omental fat, abutting the hepatic flexure with mild reactive wall thickening of the colon. Small swirling omental vessels were present within the center of the infarct. There was sigmoid and descending colonic diverticulosis without CT evidence for active inflammatory diverticulitis. There was no radiographic evidence of bowel obstruction, pelvic abscess, pancreatitis, cholecystitis, or appendicitis. These radiological findings were most consistent with a diagnosis of OI (Fig. 1, Fig. 2). Following evaluation by the surgery team, the decision was made for medical management in the absence of nonreassuring radiographic signs including pneumatosis, free intraperitoneal fluid, obstruction, or thrombus within the intra-abdominal vasculature.

He was admitted and managed conservatively with nonsteroidal anti-inflammatory and antiemetic medications. His pain gradually improved, and he was subsequently discharged home on ketorolac and ondansetron and scheduled for outpatient colonoscopy.

At the 2-week follow-up, he reported complete resolution of abdominal pain. Colonoscopy showed two 3- to 5-mm sessile adenomas in the hepatic flexure, three 4- to 5-mm tubular adenomas in the rectum, internal hemorrhoids, and moderate diverticulosis of the sigmoid colon. Repeat CT abdomen after 3 weeks demonstrated a slightly smaller circumscribed area of fat stranding measuring 52.9 × 45.2 mm with slightly increased internal soft tissue component, likely reflecting a slow resolving infarct with no abscess formation.

Discussion

Since being first described by Eithel in 1899 [2], there have been a little over 250 cases of OI identified in the literature [3]. One study cited less than 4 cases of OI per 1000 cases of diagnosed appendicitis [4].

Demographically, OI has been reported in both pediatric (approximately 15% of cases) and adult populations [5,6]. Most cases are classified as idiopathic primary OI with no identifiable cause, although predisposing anatomic factors have been

described, including presence of an accessory omentum, bifid omentum, irregular omental fat accumulation, and narrowed omentum pedicle [3]. As it classically presents on the right side, postulations have been made that anatomic variations of the right versus left epiploic vasculature may be a direct predisposing factor to its localization; however, there have been no studies to prove this hypothesis [1,6,7]. Other reported predisposing factors include obesity, heavy food intake, coughing, rapid body movement, hyperperistalsis, deep breathing, and local trauma [1,7,8]. Causes of secondary OI, which are less commonly reported, include thrombosis, vasculitis, and omental torsion [1]. Our patient's history of obesity and sudden body movement while lifting furniture potentially increased his risk for primary OI.

CT imaging of the abdomen is currently the gold standard for diagnosis of OI [8]. The typical finding for OI is a cake-like heterogeneous fatty density with surrounding inflammatory changes and hyperattenuating streaking centered in the omentum [7–10]. Occasionally, the etiology of secondary OI can be identified on imaging. For instance, if omental torsion is the precipitating factor, a concentric distribution of fibrous and fatty linear strands converging toward the infarct, referred to as the "whirl sign," may be identified [11]. The whirl sign is a sensitive indication of rotation of the mesentery and vessels but is not specific to omental torsion alone as it has been reported in small bowel obstruction, intestinal malrotation, and volvulus [12,13]. In our patient's CT imaging, there is no evidence of the whirl sign to consider omental torsion as the cause of OI and the true etiology of the events remained unknown.

Despite characteristic imaging findings, other causes of acute abdomen may mimic OI, delaying appropriate diagnosis and treatment. On CT abdomen, fat stranding disproportionally greater than bowel wall thickening is a sensitive but nonspecific finding that can be seen in OI, but may also be present in appendicitis, diverticulitis, and epiploic appendagitis [10]. Epiploic appendagitis, which mostly manifests in men of ages 40-50, is characterized by paracolonic oval fatty mass, often less than 5 cm, with a hyperattenuating rim [5,10]. In some, but not all cases, there is also a central hyperattenuated dot that represents a thrombosed vein or internal hemorrhage [5,6]. A dilated and abnormally thickened fluid-filled appendix is depicted in appendicitis [10]. Presence of diverticula with paracolic stranding and bowel wall thickening accompanied by collection of fluid around the sigmoid mesentery ("comma sign") or engorgement of the mesenteric vessels ("centipede sign") are specific for diverticulitis [10].

Although conservative medical management is recommended because of the self-limited nature of OI, some controversy exists between conservative vs surgical management. There are no published trials to date that show a statistically significant difference in short- or long-term morbidity and mortality outcomes. Conservative management with the use of nonsteroidal anti-inflammatory drugs with or without intravenous fluid administration is often encouraged as many patients experience spontaneous resolution of symptoms in an average of 13.5 days [1,7]. A case series of 14 patients demonstrated symptom improvement in 11 patients with solely conservative therapy [14]. Laparoscopic intervention can lead to a more rapid recovery within a few hours or days, but also carries associated perioperative risks [7]. Some physicians opt for surgical management because of concern for potential risk of abscess formation with conservative management [1,8].

Conclusion

Overall, the diagnosis of OI is difficult clinically and often requires CT abdomen imaging to establish the diagnosis. When identified, conservative approach to management should be considered first except in patients with abscess formation where surgery may be more appropriate.

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