



Multislice computed tomography findings of omental infarction as a rare cause of acute abdominal pain

Mustafa Koc, Selami Serhatlioglu

Firat University, Medical Faculty, Department of Radiology, Elazığ, Turkey

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Abstract

The aim of the present study was to evaluate multislice computed tomography (MSCT) findings of omental infarction, a rare cause of acute abdominal pain, together with a review of the current literature. The retrospective cross-sectional study included eighteen patients, between 2011 and 2015, who were admitted to our department with complaints of acute abdominal pain and who were subsequently diagnosed with omental infarction. Of these eleven patients, five (61%) were males and seven (39%) were females. The mean age was 48 years, ranging from 39 to 71 years. Radiologic imaging showed findings consistent with omental infarction localized to the ascending colon in six cases, descending colon in five cases, neighborhood of transverse colon in five patients, and neighborhood of the gall bladder in two patients. The size of the lesions ranged from 3 cm to 7 cm. Abdominal MSCT showing whirling pattern of vessels in the infarcted omental vessels and an oval-shaped “dirty fat ball” appearance with well-defined margins in the neighborhood of the colon. MSCT is superior to ultrasonography in the evaluation of omentum also allows rapid and accurate diagnosis of omental infarction and prevents unnecessary surgical interventions.

Keywords: Omental infarction, acute abdomen, ultrasonography, multislice computed tomography

Introduction

Omental infarction is a rare condition which is caused by impaired perfusion due to various reasons including vascular pathologies, hypercoagulation states and herniation. The most common reason is omental torsion. It can also occur as an idiopathic event. Omental torsion can be primary or secondary. Primary torsion is caused by omentum anomaly, excessive exercise, sudden movements, and hyperperistalsis, while secondary is mostly caused by factors such as herniation or tumors [1-3].

The patients often present with sudden-onset abdominal pain. The condition can occur at different localizations in the abdomen, and it is often confused with other acute abdominal disease such as acute appendicitis, renal colic, diverticulitis, and acute pancreatitis [4-6].

The patients may clinically exhibit gastrointestinal symptoms accompanied by fever and leukocytosis. Omental infarction is more commonly observed in obese patients in the fourth to fifth decade of life. The male to female ratio is 2:1. Ultrasonography and multislice computed tomography (MSCT) are the most commonly employed radiologic imaging modalities. It is important to evaluate omentum during US and CT scans obtained for various indications in patients presenting with the findings of acute abdomen. The US examination of omental infarction shows non-

compressible, oval-shaped, large, hyperechoic, immobile, solid mass lesions just beneath the abdominal wall on an area of severe tenderness. The Doppler US often shows no flow in the mass. The lesion can be ideally visualized by MSCT with I.V. or oral contrast enhancement. MSCT shows a mass lesion with focal heterogeneous density in the omental fat tissue in the area described by the US and smudging in the neighboring soft tissue [7]. The appendix appears normal. There may be some intra-abdominal free fluid.

A conservative approach is used in the treatment [8]. There is no need for surgery. Laparoscopic excision can be required in complicated cases. The present study evaluated radiologic findings together with the review of contemporary literature in patients, who presented to our hospital with acute abdominal pain and who were subsequently diagnosed with omental infarction.

Materials and Methods

Non-interventional clinical research ethics committee of Firat University Faculty of Medicine issued approval for the present clinical study. The study included eighteen patients, between 2011 and 2015 who presented to our department complaining of acute abdominal pain and who were subsequently diagnosed with omental infarction based on the radiologic investigations. MSCT images of the cases were acquired using Toshiba Aquilion 64 slice MSCT scanner. The area between the diaphragm and iliac crest was defined as the scan area. The images were obtained

*Corresponding Author: Mustafa Koc, Firat University, Medical Faculty, Department of Radiology, Elazığ, Turkey
E-mail: mkoc44@yahoo.com

using the following parameters: 120 kVp, 150-200 mAs, 0.5-mm collimation, 0.3 mm sequence thickness, large FOV (30 cm), and pitch of 1-1.5. The examinations were performed at 15-minute intervals after oral intake of 1000-1500 mL water one hour before image acquisition. All examinations were performed in the supine position with automatic administration of 100 mL Iopamide or 100 mL Iohexol via the right antecubital vein at a rate of 3 ml/sec with a single breath holding at 65 seconds.

MSCT images were transferred to the workstation (VITAL, Vitrea 2, HP XW6400 Workstation, USA). The images were evaluated after reformatting in the axial, coronal, and sagittal planes. The images of each patient were examined in terms of mass size, content, localization, contiguity, surrounding fat planes, contrast uptake, and other pathologies observed in the examined area of interest and the findings were recorded.

Results

Of eighteen cases, eleven (61%) were males and seven (39%) were females. The mean age was 48 years, ranging from 39 to 71 years. Systematic examination did not reveal major pathology other than the findings of acute abdomen. Routine laboratory tests revealed mild leukocytosis in nine cases. Radiologic imaging showed findings consistent with omental infarction localized to the ascending colon in six cases, descending colon in five cases, neighborhood of the transverse colon in five patients, and neighborhood of the gall bladder in two patients. The size of the lesions ranged from 3 cm to 7 cm (Table 1).

Table 1. The localization, case number, and size of patients with omental infarction

Localization	Case number	Size
Ascending colon	6	2-6 cm
Descending colon	5	4-7 cm
Transverse colon	5	3-7 cm
The gall bladder	2	4-6 cm

Of these patients, nine underwent abdominopelvic US that showed a non-compressible, oval-shaped, large, hyperechoic, immobile, non-specific solid mass lesion just beneath the abdominal wall on the area of severe tenderness; further examination with contrast enhanced CT was recommended. There was a slightly increased intra-abdominal fluid in three cases. The rest of the nine patients had no US examination that they were applied directly to MSCT from clinical doctor.

There were mass lesions with focal heterogeneous density and smudging in the surrounding soft tissue and mesentery, solid mass lesions with fatty content, and well-defined margins measuring 3-7 cm in size, showing weak peripheral contrast uptake in the omental fat tissue adjacent to ascending and descending colon in eleven patients, in the transverse colon and the gall bladder in seven patients in oral and I.V. contrast enhanced MSCT images. Abdominal

MSCT with I.V. contrast material showed whirling pattern of vessels in the infarcted omentum and an oval-shaped “dirty fat ball” appearance with well-defined margins in the neighborhood of the colon. The radiologic appearance was suggestive of omental infarction (Figure 1, 2, 3a and b). The patients were administered medical therapy using a conservative approach and full recovery was observed in the symptoms; no complications were observed.

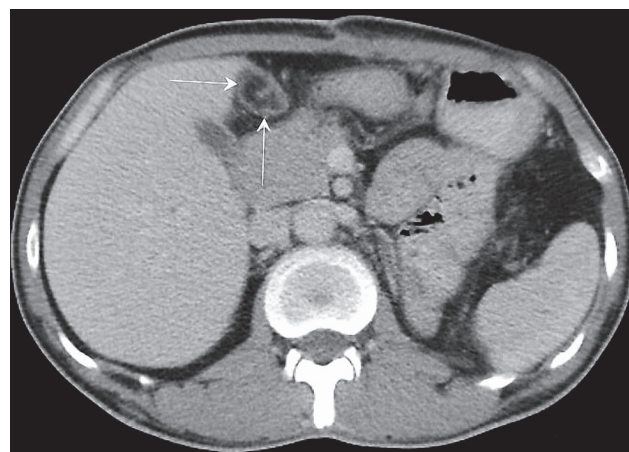


Figure 1. Axial upper abdominal MSCT scan with contrast enhancement showing fatty mass in the neighborhood of the gall bladder (arrows).

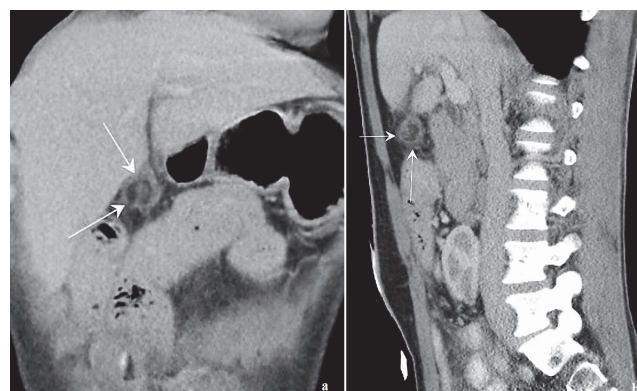


Figure 2 a-b. Upper abdominal MSCT with I.V. contrast enhancement showing whirling pattern of vessels in the infarcted omental vessels, a) coronal image, b) sagittal image (arrows).

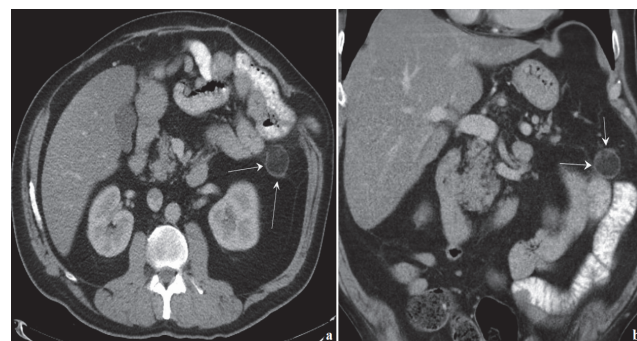


Figure 3 a-b. MSCT with oral and I.V. contrast enhancement showing an oval-shaped “dirty fat ball” appearance with well-defined margins in the neighborhood of the descending colon as the classical finding of omental infarction, a) axial image, b) coronal image (arrows).

Discussion

Omental infarction is a rare condition, developing secondary to the impairment of omental perfusion. It accounts for 0.1% of all cases undergoing laparotomy due to acute abdominal pain [9]. Clinical findings are non-specific. Pain occurs in the abdominal quadrants depending on the localization of peritoneal irritation. Mild fever and vomiting can be occasionally observed. Leukocytes may be elevated. Omental infarction has typical radiologic findings [10]. This condition can be diagnosed preoperatively and therefore unnecessary interventions can be avoided. Omentum must be carefully evaluated with US and MSCT examinations.

During ultrasonographic evaluation, compression with the probe can detect non-compressible, hyperechoic, immobile mass beneath the anterior abdominal wall on the area with severe tenderness. Intra-abdominal fluid collection can be found, if any. Differential diagnosis should be made with epiploic appendagitis exhibiting similar findings. Mass effect and edema in the neighboring bowel wall and adhesions and thickening in the peritoneal peritoneum are observed in epiploic appendagitis. It occurs more often in the right lower quadrant, and the lesion is usually surrounded by a hyperechoic ring. Central dot sign is observed due to thrombosis in the vessels, and hemorrhage [1,7,10,11].

Omental torsion as a cause of omental infarction is suggested at MSCT when a whirled pattern of concentric linear strands is seen. Distinction from diverticulitis can be made by lack of an adjacent diverticulum, abscess, and bowel wall thickening. Contrast enhanced abdominal MSCT is the ideal imaging method in visualizing omental infarction. MSCT shows heterogeneous fat tissue with hyper-attenuated stranding between the anterior abdominal wall and colon. Pericolonic inflammatory changes can be observed. Large bowel wall thickening is not frequent. There may be adhesions to the large bowel wall or parietal peritoneum. Its size ranges between 3-10 cm.

The findings of omental fat infiltration observed on MSCT can be also found in other diffuse neoplastic disorders. In omental infarction, thickening can be found in the peritoneum, bowel wall, and liver capsule, in addition to infiltration of omentum and diffuse ascites is observed [12]. Primary omental tumors must be considered in the differential diagnosis of isolated omental infiltrations.

Differential diagnosis of omental infarction includes other pathologies that can cause acute abdomen such as acute appendicitis, epiploic appendagitis, omental torsion, pancreatitis, and fibrosing sclerosing mesenteritis.

Omental infarction is a benign, self-limiting inflammation. The inflammatory process is followed by retraction, fibrosis, complete resolution, and auto-amputation [13].

Sepsis, abscess formation, adhesions, and bowel obstructions are late complications [2]. Conservative therapy is sufficient in the treatment of cases with omental infarction. Patient complaints usually diminish in a few days with conservative therapy. Radiological improvement is seen in 1-2 weeks. Complications are not frequently observed. Laparoscopic excision is the choice of therapy in cases requiring intervention [5,14].

In conclusion, radiologic findings are diagnostic in omental infarction, which is a rare cause of acute abdominal pain. MSCT examinations with contrast material allow rapid and accurate diagnosis of omental infarction and prevent unnecessary surgical interventions.

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