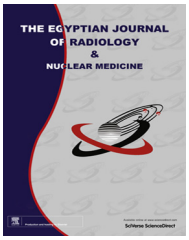
The Egyptian Journal of Radiology and Nuclear Medicine (2015) **46**, 305–314

Egyptian Society of Radiology and Nuclear Medicine

The Egyptian Journal of Radiology and Nuclear Medicine

www.elsevier.com/locate/ejrnm
www.sciencedirect.com



ORIGINAL ARTICLE

Diagnostic value of multidetector computed tomography in differentiation of benign and malignant omental lesions

Alsiagy A. Salama [a,*], Aly Aly Elbarbary [a], Mohamed Hamdy Aboryia [b]

[a] *Radiodiagnosis & Imaging Department, Faculty of Medicine, Tanta University, Egypt*
[b] *Unit of Gastrointestinal Surgery, General Surgery Department, Faculty of Medicine, Tanta University, Egypt*

Received 16 December 2014; accepted 13 February 2015
Available online 6 March 2015

KEYWORDS

MDCT;
Omental lesions;
Peritoneal carcinomatosis;
Tuberculous peritonitis

Abstract *Objective:* To assess the diagnostic value of multidetector computed tomography (MDCT) in differentiation of benign and malignant omental lesions.
Patients and methods: MDCT scan was performed for 37 patients with omental lesions after administration of oral and intravenous contrast. The CT diagnosis was compared with the final histopathological findings. Sensitivity, specificity, and diagnostic accuracy of MDCT were calculated using surgical and histopathological findings as the gold standard.
Results: MDCT findings of all cases with omental torsion, cystic lymphangioma, and loculated fluid in the greater omentum correlated with the surgical and histopathological findings with 100% diagnostic accuracy. However, the diagnosis was missed in two patients from seven (2/7) with tuberculous peritonitis and in two patients from 21 (2/21) with peritoneal carcinomatosis with sensitivity, specificity and diagnostic accuracy of 73%, 92%, 85% and 90%, 95%, 93%, respectively.
Conclusion: MDCT is an excellent diagnostic tool for evaluating omental lesions, especially those present with nonspecific clinical manifestations.

1. Introduction

The peritoneum and omentum are common sites for a variety of neoplastic diseases, both primary and metastatic. The greater omentum represents a privileged metastatic site for ovarian as well as gastrointestinal cancers (1).

Less frequently, non-neoplastic processes such as granulomatous disease, infections, or inflammatory conditions may also involve the omentum and the peritoneum and may mimic neoplastic disorders (2,3).

Abbreviations: MDCT, multidetector computed tomography; SD, standard deviation; *X*, mean; ERCP, endoscopic retrograde cholangio-pancreatography; HCC, hepatocellular carcinoma.

* Corresponding author at: Radiodiagnosis & Imaging Department, Tanta Faculty of Medicine, Tanta, Gharbiya, Egypt. Mobile: +20 01113558503; fax: +20 40 3407734.
E-mail address: siagyali33@yahoo.com (A.A. Salama).

Peer review under responsibility of Egyptian Society of Radiology and Nuclear Medicine.

http://dx.doi.org/10.1016/j.ejrnm.2015.02.003

In patients with a known primary malignancy, the discovery of peritoneal or omental mass likely indicates metastatic disease (4); however, the possibility of a benign cause or the presence of a second primary tumor is to be excluded (5,6).

Tuberculosis (TB) is still prevalent in developing countries. Recent resurgence of TB has also been seen in the developed countries, particularly among AIDS patients and among immigrant population (7).

The diagnosis of tuberculous peritonitis is still challenging and very important. A high index of suspicion particularly in high-risk groups and early and accurate diagnosis leads to an effective therapy and good survival rates. Delayed initiation of treatment can lead to high mortality rates (8,9).

On CT, the normal greater omentum appears as a band of fatty tissue with variable width. The CT appearance of omental pathology is dependent on the extent and duration of disease involvement. Early omental disease manifests as a smudged or permeated appearance of the omental fat. Enhancing soft tissue nodules form within the omentum as the disease progresses. An omental cake arises when these nodules coalesce to form a diffusely thickened mass and replace the normal fat (4). Depending on the cause of the omental cake and the extent of intraperitoneal disease, ascites may be an accompanying feature (10).

Computed tomography (CT) is a major diagnostic tool for evaluating omental lesions, especially those that may appear with nonspecific clinical manifestations. The greater and lesser omenta are anatomically complicated areas to fully assess at CT. As such, omental pathologic conditions may appear as various and nonspecific findings, ranging from a fluid collection to diffuse omental infiltration. High-resolution multidetector CT with multiplanar reformation improves demonstration of the omental anatomy and detection of omental pathologic conditions (2).

Differentiation of neoplastic involvement of the omentum from benign omental thickening can sometimes be challenging in clinical practice. Tuberculous peritonitis and peritoneal carcinomatosis have many clinical, laboratory, and imaging findings in common. A solid diagnosis is mandatory for a proper management (11). So the aim of our study was to assess the diagnostic value of multidetector computed tomography (MDCT) in differentiating benign and malignant omental lesions.

2. Patients and methods

2.1. Patients

This study was carried out at Radiology Department at Tanta University Hospital during the period from April 2013 to October 2014, and included 37 patients with omental lesions who were referred for CT evaluation after an inconclusive abdominal ultrasonographic examination.

There were 24 females and 13 males, their ages ranged from 21 to 72 years, with a mean age of 47.45 ± 15.52 years. All patients signed an informed consent before enrollment in the study. The study protocol was approved by the local ethical committee of Faculty of Medicine, Tanta University.

2.2. Methods

All patients were subjected to the following:

- Detailed history, thorough clinical examination and routine laboratory investigations.
- Abdominal multidetector CT (MDCT) study, with coronal and sagittal reconstruction.

CT technique

CT examinations were performed by using a 16-section multi-slice CT scanner. Scans were obtained with 1 mm slice thickness from the diaphragm to the symphysis pubis. Intravenous contrast material was administered as a bolus injection. Oral contrast administration with 1000 ml water and 100 ml mannitol in 25 patients, and diluted gastrografin (50 ml contrast and 1000 ml water) in 12 patients both were taken continuously over 45 min before imaging. The patients were imaged in supine position at 40 s (portal phase) after intravenous administration of 1–1.5 ml/kg, with a maximum dose of 100–120 ml. However triphasic study was done for two cases with hepatic masses.

Other investigations were used to complete the evaluation of the patients according to their conditions. These included endoscopy with biopsy for 6 patients, ultrasound-guided biopsy of omental masses for 11 patients and diagnostic laparoscopy for 5 patients.

The gold standard for the diagnosis was surgical findings and histopathological examination. Accordingly, patients were classified into benign and malignant groups and their data as well as MDCT diagnostic accuracy were compared.

Sensitivity, specificity, and diagnostic accuracy of MDCT were calculated using surgical and histopathological findings as the gold standard.

2.3. Statistical analysis

All statistical analyses were computed with the Statistical Package for the Social Sciences (SPSS) Version 16. Results were expressed as means ± standard deviation (SD), number and percent (%). Comparison between categorical data was performed using chi-squared test. For comparison between quantitative data student *t*-test was used. Sensitivity, specificity, and diagnostic accuracy were calculated. P value < 0.05 was considered as the statistical significance level.

3. Results

Thirty-seven (37) patients with omental masses as evidenced by omental thickening on CT were prospectively enrolled in this study. Their ages ranged from 21 to 72 years, with a mean age of 47.45 years. They were 24 (64.9%) females and 13 (35.1%) males. The common clinical presentations included abdominal discomfort (67.5%), ascites (56.7%), weight loss (35.1%) acute abdomen (24.3%), recurrent fever (24.3%) and abdominal lump (21.6%) Table 1.

Histopathological examination confirmed benign conditions in 16 (43.2%) patients (tuberculous peritonitis ($n = 7$), omental torsion ($n = 5$), cystic lymphangioma ($n = 1$) and encysted bile stained and bloody fluid collection in the greater omentum ($n = 3$)) and malignant conditions in 21 (56.8%) patients. Of the 21 patients with malignant conditions, 20 (54.1%) had metastatic adenocarcinoma of whom eight proved to be of ovarian ($n = 8$) origin, four proved to be of