

Ultrasound Diagnosis of Greater Omental Hematoma: A Case Report

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1. Abstract

A 31years female came to our hospital with upper left abdomen pain for 3 months. Both abdominal enhanced CT and MRI reveal multifocal diseases between the stomach and pancreas, and similar mass shadow could be seen in the left upper abdominal greater omentum. An ultrasound-guided puncture biopsy was performed to further clarify the nature of the omental mass. The ultrasound examination of the peritoneum was performed in our hospital. Ultrasound examination showed that cystic-solid mixed nodules were seen in the left upper abdominal omentum, mainly with solid low echo, regular shape, clear boundary, slightly enhanced posterior echo, CDFI, and SMI scan: there was no obvious blood flow in it. Considering the trauma history of the patient's left upper abdomen, The lesions were considered to be hematoma with organization. so, puncture is not appropriate. The gastric and pancreatic mass and instrumental lesions were recorded. Postoperative pathology suggested heterogeneous hemorrhagic components in the omental lesion, and extensive inflammatory cell infiltration in the fibrocystic wall was observed under the microscope, which was considered to be hematoma with mechanization formation.

A 31-year-old Chinese female arrived at our hospital with left upper abdominal discomfort for 3 months and aggravated for 1 week. The patient had epigastric discomfort and slight abdominal pain after meals for 3 months, and the symptoms got worsened with a fever of 38.3°C 1 week ago. Admission physical examination: soft abdomen, mild tenderness in the left upper abdomen, no muscle tension, and rebound pain. Clinical test: carcinoma antigen125:118U/ml(0-35U/ml), and other laboratory tests showed no

abnormality. History: About 1 month ago, a child kicked her in the upper left abdomen, showing transient intense pain, and did not seek medical attention.

Enhanced CT abdomen: multiple soft tissue density shadows between the stomach and pancreas with edge enhancement on the enhanced scan, some of the lesions were poorly defined with the gastric wall, and masses of similar nature were seen in the left epigastric greater omentum, diagnosis: the nature of the lesion was to be determined (Figure 1). MRI: multiple mixed-signal shadows were seen between the stomach and pancreas, mainly short T1 and long T2 signals, with separation, and edge enhancement on the enhancement scan, some of the lesions were poorly defined with the gastric wall, and a mass of similar nature was seen in the left epigastric omentum. An ultrasound-guided puncture biopsy was performed to clarify the nature of the mass in the left epigastric omentum. The ultrasound examination showed a mixed cystic and solid nodule in the left epigastric omentum, with a predominantly solid hypoechoic pattern, regular morphology, clear borders, and slightly enhanced posterior echogenicity. CDFI and SMI scan: no significant blood flow was shown within it. Combined with the patient's history of left upper abdominal trauma, it was considered that the hematoma with mechanization might be large and should not be punctured (Figure 3).

To clarify the nature of the mass between the stomach and pancreas, partial gastrectomy and resection of the intra-retinal mass were performed clinically. Postoperative pathology: gastrointestinal mesenchymal tumor (gastric mass) and a large area of necrotic tissue within the fibrous cystic tissue of the omentum (large omental mass) (Figure 4).



Figure 1: CT - The mass with CT value of 26hu could be seen in the omentum of left upper abdomen.

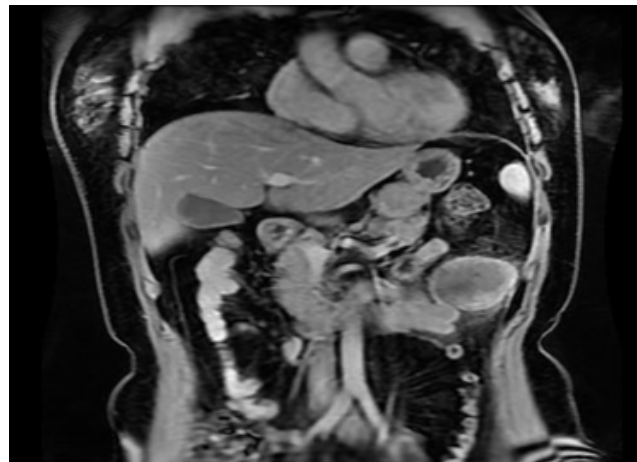


Figure 2: There were multiple mixed signal shadows between the stomach and pancreas, and similar signal shadows were seen in the omentum of the left upper abdomen.

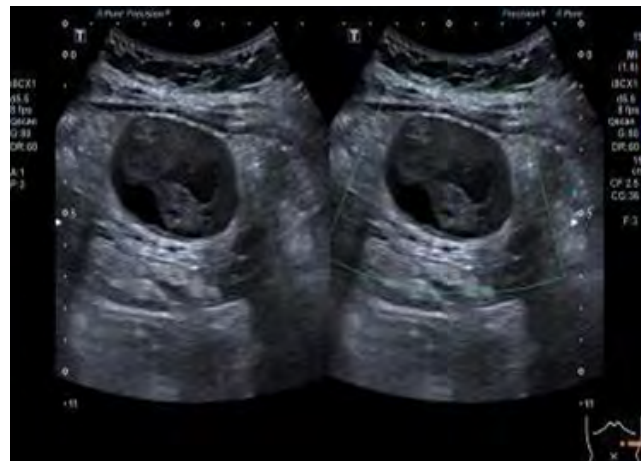


Figure 3: Ultrasound - The size of the mixed cyst solid lesion in the omentum of the left upper abdomen was about 5.20cm × 4.00cm × 4.30cm.

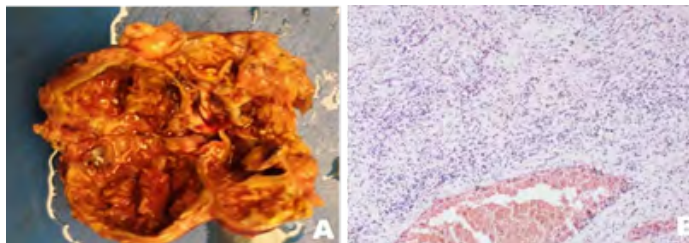


Figure 4: Pathology - A. lesion after operation solid map; B. pathological map (HP × 100)

2. Discussion

The greater omentum is the largest peritoneal fold in the human body. It is composed of four layers of peritoneum, containing a large amount of adipose tissue. The omentum is thin in normal people with a thin body shape, which is difficult to be detected by ultrasound. When the lesions are accumulated over time, the greater omentum may have inflammatory or tumor lesions, which can cause pathological and morphological changes [1]. At this time, abnormal omental tissue is easy to detect, and its ultrasonic signs have certain characteristics. But the diagnosis of the nature of the lesion needs pathological support. The most common benign lesions of omentum were omental tuberculosis [2]. The ultrasonographic manifestations were moderate and high echo. The blood flow could be rich. The ascites of patients with tuberculosis could have dense fiber separation due to fibrin exudation. At the same time, the thickening of the parietal peritoneum and mesenteric lymph nodes was also shown [3]. Metastatic carcinoma is the most common malignant lesion of the omentum. Ovarian cancer is the primary focus of female patients, while digestive tract tumor is the primary focus of male patients. The echo of the omentum was hypoechoic, with nodules and abundant blood flow. The ascites were mostly bloody and heterogeneous echoes [4, 5].

The formation of omental hematoma is mostly related to abdominal trauma, surgery, hemorrhagic necrotizing pancreatitis, and tumor hemorrhage. At present, there are few reports, most of them are cases, the clinical manifestations are not typical, and most of them are abdominal pain. Abdominal enhanced CT examination has high application value in the diagnosis of the origin of hematoma, and abdominal puncture is helpful for the definite diagnosis [6]. The ultrasonic findings of this patient were typical. The thickened omental cystic solid mixed nodule had a regular shape and clear boundary. There was no blood flow inside. At this time, the patient asked about the history of left upper abdominal trauma. The patient remembered that the left upper abdomen had been kicked by a 7-year-old child. Combined with the medical history, the disease was considered an omental hematoma with organization.

This disease should be differentiated from other diseases such as omental cyst, omental metastatic carcinoma, omental stromal tumor, and visceral perforation. 1) The sonographic features of the greater omental cyst were the cystic echo in omentum, clear in the lumen, significantly enhanced in posterior echo, and no blood flow in the cyst [7]. 2) The sonographic features of omental metastasis

carcinoma are diffuse or localized thickening, nodular changes, medium echo or low echo, uneven internal echo, multiple nodules, and small diameter. CDFI often indicates internal blood flow. The primary lesions can be seen by abdominal scans [5]. 3) only a few cases of omental stromal tumors are reported. The sonographic features of these tumors are mostly hypoechoic nodules in the thickened omentum, flake, or scattered anechoic areas in the nodules, and the lesions are larger, with a diameter of more than 10 cm [8]. 4) When visceral perforation occurs, the omentum of the greater omentum is abnormally gathered into a mass or thick sheet, which is a diffuse fog-like medium to slightly strong echo or low echo, which can be gathered around the perforated organs, presenting a “wrapping sign”, and gathering in the space of abdominal viscera as a “packing sign” [9].

Through the study of this case, the author’s experience is as follows: 1) for the single cystic solid mixed lesions in the greater omentum, the shape is regular, the boundary is clear, the posterior echo is enhanced, and there is no blood flow display inside the greater omentum, the medical history should be inquired, and the possibility of hematoma should be considered after excluding other common diseases of omentum. 2) According to the causes of formation, the greater omental hematoma can be divided into “true” and “pseudo” hematoma. True hematoma refers to the accumulation of blood in omental tissue due to the rupture of omental vessels due to trauma or internal factors. The ultrasonographic manifestations of the hematoma are as follows: the shape of the omental tissue is regular, and there is no echo; the echo of the posterior part can be enhanced; there is no blood flow in the hematoma. Pseudohematoma refers to the hemorrhage and deposition of other tissues and organs in the abdominal cavity, which produces inflammatory stimulation and causes the greater omental tissue to gather and surround to form an encapsulated hematoma. Its ultrasonic manifestations need to be further studied.

3. Declarations

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3.2. Ethics Approval and Consent to Participate: This article does not contain any studies with human participants or animals performed by any of the authors. Informed consent was obtained from all individual participants included in the study. The Ethics

Committee of the First Affiliated Hospital of China Medical University (Liaoning, China) approved the study protocol.

3.3. Consent for Publication: The authors affirm that human research participants provided informed consent for publication of the images in Figures 1,2,3 and 4. Publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out.

3.4. Authors' contributions: All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Meiqiao Li, Zhiguang Chen and Xue-mei Wang. The first draft of the manuscript was written by Meiqiao Li and Zhiguang Chen critically revised the work. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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