CT And MR Imaging Features of a Non-Pancreatic Pseudocyst of the Mesentery

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Wide range of congenital and acquired cysts that arise from various tissue linings of the abdomen are grouped as mesenteric cysts. A non-pancreatic pseudocyst of the mesentery is an uncommon, acquired pathologic entity, developing secondary to trauma or infection. Awareness of the imaging features of non-pancreatic pseudocyst may help radiologists to differentiate them other abdominal neoplastic processes and may prevent unnecessary surgery. We report CT and MR imaging features of a non-pancreatic pseudocyst of the mesentery.

Key words: Pseudocyst, mesentery, CT, MR

Eur J Gen Med 2009; 6(1):49-51

INTRODUCTION

A non-pancreatic pseudocyst of the mesentery is an uncommon, acquired pathologic entity, developing secondary to trauma or infection (1-3). These mesenteric cysts are unrelated to pancreatitis and the wall of a pseudocyst is composed of fibrous tissue rather than epithelial lining that are seen in true cysts (2, 3). It may be difficult to make an accurate preoperative diagnosis of a non-pancreatic pseudocyst from other mesenteric cysts or neoplasms (1). We report CT and MR imaging features of a non-pancreatic pseudocyst of the mesentery.

CASE

A 59-year-old man presented to the emergency room with two-day history of abdominal pain, nausea and vomiting. His past medical history was significant for partial gastrectomy and gastrojejunostomy due to peptic ulcer perforation twelve years ago and colonic polyp resection ten years ago. CT scan of the abdomen showed a 5.0×3.8 cm, well-marginated, rounded mass in the left upper quadrant, within the small bowel mesentery. The mass showed homogenous fat attenuation and contained no soft tissue component (Figure 1). The adjacent small bowels and mesenteric vessels were compressed. Based on these CT findings, the mass was interpreted as a lipoma.

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Five months later, the patient was admitted to the emergency room again for a sudden onset of left upper quadrant pain and nausea. He denied fever. His biochemical laboratory values were within normal limits. On physical examination, he exhibited involuntary guarding, rebound, and tenderness over the epigastrium and left upper quadrant. Bowel sounds were normal. CT scan of the abdomen demonstrated interval increase size of the left upper quadrant fatty mass measuring 6.4×4.5 cm. There was a new nodular soft tissue rim surrounding the mass and fat stranding in the adjacent mesentery and omentum. A soft tissue density in the dependent portion and two punctuate calcification abutting its medial aspect is also noted. MR imaging was obtained for further evaluation with a protocol including axial FSE T2–weighted images, axial in-phase and out-of-phase T1-weighted, and axial dynamic fat suppressed T1-weighted gradient-echo images following intravenous administration of 20 cc of gadolinium. On T2- weighted images, the internal content of the mass showed bright signal intensity with dependent dark signal intensity material. On dual echo T1-weighted images, the internal content of the mass showed leveling. While the non-dependent portion was being bright on in-phase images and demonstrating significant signal drop on out-of-phase images, indicating presence of fat, the dependent portion showed no signal drop. Post gadolinium images confirmed, a 3 mm thick enhancing rim (Figure 2). Interval development of enhancing rim raised concern for development of a liposarcoma or

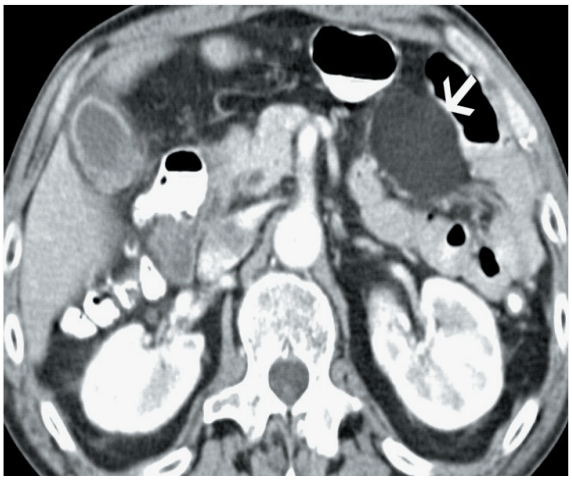

Figure 1. Contrast-enhanced axial CT image demonstrates a 5.0 × 3.8 cm, well-marginated mass within the small bowel mesentery (arrow). The mass showed homogenous fat attenuation and was interpreted as a lipoma.

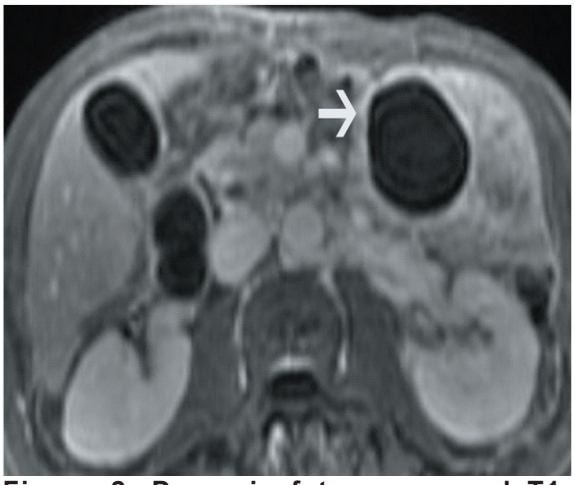

Figure 2. Dynamic fat suppressed T1-weighted image following intravenous gadolinium shows enhancement of the wall of the cystic mass (arrow).

a superimposed inflammatory process and the patient underwent for elective exploratory laparotomy two months after. At surgery, a firm cystic mass was encountered in the mesentery of the proximal jejunum. The mass together with a segment of small bowel and its mesentery was resected and sent to pathology laboratory for evaluation.

The gross specimen showed a 6.5×4.0 cm cystic mass, which was filled with homogeneously white, milky fluid. The mass was adherent to the mesenteric side of the small bowel without invasion of bowel wall. Histologic evaluation of the cyst showed the material in the cyst cavity was acellular, necrotic, and lipid-like. The cyst wall was lined by fibrous tissue, with no evidence of an endothelial lining and showed chronic inflammation with lipid clefts and calcification, which are indicative of prior rupture. There were adjacent disorganized muscular arteries and veins that exhibited intimal hyperplasia, organizing thrombus and recanalization. Therefore, the final diagnosis was rendered as a non-pancreatic pseudocyst of the mesentery that had undergone focal rupture.

DISCUSSION

Mesenteric cysts are rare intrabdominal masses with an incidence of approximately 1/100,000 hospital admission in adults (1). Wide range of congenital and acquired cysts that arise from various tissue linings of the abdomen are grouped as mesenteric cysts. Therefore, the term of "mesenteric cyst" refers to topographic site rather than histological diagnosis. Mesenteric cysts can originate from lymphatic (lymphangiomas), mesothelial (mesothelial cyst), gastrointestinal (enteric duplication cyst and enteric cyst) cells, or can be secondary to trauma, surgery or infection (pseudocyst) (2).

Pseudocysts develop secondary to trauma or infection and thought to be the sequelae of a mesenteric or omental hematoma or an abscess that did not resorb completely (3). These cysts are unrelated to pancreatitis; therefore, the cystic fluid contains no high levels of amylase or lipase. Therefore, to prevent confusion with much more common pancreatic pseudocyst, mesenteric pseudocysts are called as nonpancreatic pseudocyst. They may be found incidentally on an asymptomatic patient; abdominal pain, nausea, and vomiting are the most frequently reported symptoms (4). A palpable mass is often the only finding on physical examination (4). On gross pathological examination, nonpancreatic pseudocysts appear as unilocular, thick-walled cystic mass in the mesentery or omentum with serous, hemorrhagic, purulent or occasionally chylous content (3-6). The wall of a nonpancreatic pseudocyst contains no endothelial lining on histopathologic examination and is composed of fibrous tissue that may present calcifications and inflammatory changes (3-6).

On sonography, nonpancreatic cysts frequently demonstrate intracystic echogenic debris (4). Thick-walled cystic mass that may contain fluid-fluid level is typical CT imaging findings of a nonpancreatic pseudocyst. While the non-dependent portion of the cyst shows fat density, the dependent portion demonstrates water density. These two components are easily mixable by patient's motion, and it required approximately 30 minutes for the fluid-fluid level to form (4). This is the reason why the cyst of our patient showed homogeneous fatty content on CT scan whereas demonstrated a fluid-fluid level on MRI due to longer scan time, allowing fluid-fluid level to form. MRI can reliably demonstrate the fatty content of a cyst by using either frequency selective fat saturation or chemical shift (in-phase and out-of phase) imaging (6). Although, frequency selective fat suppression technique effectively reduces macroscopic fat signal, so a larger amount of fat is required for its effect, such as in lipomas and liposarcomas, chemical shift imaging allows identifying small amount of (microscopic) fat within a mass.

Chylous content of a cyst is not unique to nonpancreatic pseudocyst. Rarely, lymphangiomas and enteric duplication cyst can also have a fatty content. Lymphangiomas are rare benign tumors that composed of a proliferation of dilated lymphatic spaces lined by flat endothelial cells, and typically occur in the head and neck of children (2, 3). Lymphangiomas can also occur in the abdomen; most commonly in the retroperitenium or mesentery (1). On imaging, they are typically seen as multiloculated, less frequently unilocular, non-enhancing, thin-walled cystic structures and show variable attenuation value, ranging from clear fluid to fat. When it located in the small bowel mesentery, the cystic space may be filled with chyle (6). Enteric duplication cysts are ectopic enteric tissue and contain all enteric layers in their wall, including mucosa, muscularis and nervous plexus. They are usually attached to a normal bowel and present as a thick-walled, unilocular cyst with serous content, which may be rarely chylous (3). The wall of enteric duplication cyst may enhance with contrast. Unlike enteric duplication cyst, an enteric cyst is lined by enteric mucosa only and appears as a thin-walled, unilocular cyst with serous content (3).

Mesothelial cysts result from incomplete fusion of peritoneal layers and are pathologically differentiated from the cysts from other origins by the presence of mesothelial cell lining in their inner surface (2, 3). These cysts are typically unilocular, contain serous material, and more commonly located in the mesentery or omentum (3). Mesothelial cysts have no discernable wall or internal septations.

In our case, the patient's age and imaging appearance with unilocular cyst with thick wall makes congenital lymphangiomas unlikely, and the lack of endothelial lining is not consistent with a neoplastic process such as lymphangioma, mesothelial cyst or a cyst of enteric origin. In the light of presence of fibrous wall in histological evaluation, the cyst likely represents an acquired pseudocyst that developed secondary to a prior surgery.

When symptomatic, surgical excision of a nonpancreatic pseudocyst is usually recommended (4). If the adjacent bowel is closely involved, than an excision of the cyst with a segmental resection of the bowel may be necessary (4).

In conclusion, a nonpancreatic pseudocyst is seen in patients with prior history of abdominal infection, surgery or trauma and has distinct imaging features, characterized by a thick-walled solitary cyst with chylous content. Awareness of these imaging features may help radiologists to differentiate them from other abdominal neoplastic processes and may prevent unnecessary surgery.

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