The Multi-Detector CT findings of giant abdominal lymphangiectasis mimicking a mesenteric cystic mass in a patient with midgut volvulus

Midgut Volvuluslu Bir Hastada Mezenterik Kistik Kitleyi Taklit Eden Dev Abdominal Lenfanjiyektazinin ÇKBT Bulguları

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Our purpose is to show the Multi-Detector CT (MDCT) findings of an intra-abdominal giant cystic lesion with midgut volvulus and to share our experience with giant lymphangiectasis mimicking a mesenteric cyst or a cystic mass. The pathological evaluation indicated that the cyst contained abdominal lymphatic material. Malrotation is usually detected in infants and children, but rarely in adults. In patients with chronic and recurrent volvulus, chronic venous congestion with lymphatic engorgement may occur. Interference with lymphatic drainage may result in formation of a lymphangioma or a chylous mesenteric cyst. In our case, because of the intestinal lymphatic torsion, there was a cystic lesion mimicking a mesenteric cyst or a cystic mass. To our knowledge, this is the first case of midgut volvulus and large mesenteric lymphangiectasis to be depicted by MDCT.

Keywords: Intestinal lymphangiectasis, MDCT, Midgut volvulus

Anahtar Kelimeler: ÇKBT, İntestinal lenfanjiyektazi, Midgut volvulus
Introduction

M alrotation is a non-specific term that comprises a variety of anomalies in intestinal rotation and fixation [1]. It is usually detected in infants and children, but rarely in adults. The most important complication of malrotation is midgut volvulus, which can result in bowel necrosis [2]. In midgut volvulus, the lymphatic ducts are also torsioned with the mesenteric vein, the artery, and intestinal loops. In this report, we present the MDCT findings of a case with significantly dilated, tortuous abdominal lymphatic ducts mimicking a cystic mass and accompanying midgut volvulus.

Case Report

A 7-year-old boy was admitted to the emergency department with abdominal pain, reduced appetite, nausea, and vomiting. The physical examination revealed severe peritoneal irritation on deep palpation of the right lower quadrant. The white blood cell count was 17,100 /mL. Serum biochemistry tests were within normal limits. Plain films of the abdomen revealed distension of the stomach and duodenum. Abdominal gray-scale sonography showed an 11-cm heterogeneous, semi-solid cystic mass in the right lower quadrant of the abdomen (Fig. 1). In addition, a whirlpool sign, indicating midgut volvulus, was demonstrated on the emergent abdominal color Doppler ultrasound (US). A MDCT scan was performed to acquire more information for a differential diagnosis of the lesion. An abdominal CT examination including sagittal and coronal reconstructed images was performed with a 16-detector-row CT scanner (Aquillon; Toshiba Medical Systems, Tokyo, Japan). A MDCT angiography examination was performed with low-radiation-dose techniques and with the following technical parameters: a detector collimation of 16x0.5, a pitch of 1.75, a reconstruction interval of 1 mm, a slice thickness of 1.25 mm, a table speed of 14 mm/sec, a gantry rotation time of 0.5 sec, and settings of 30 mAs, and 80 kVp. The patient received nonionic intravenous (IV) contrast material (320 mg/mL) at a dose of 2 mL per kilogram of body weight. The scan was initiated 12-15 sec after the start of the IV contrast material injection. Three-dimensional (3D) volume-rendered (VR) images were obtained from axial images at a separate workstation to display vascular and osseous structures. The abdominal MDCT showed a twist of the mesenteric vessels, suggestive of a midgut volvulus, and there was a multicystic mass with smooth contours in the right lower quadrant of the abdomen (Fig. 2a). The superior mesenteric vein (SMV) was positioned abnormally to the left of the superior mesenteric artery (SMA), and the SMA was encircled counterclockwise by the SMV and bowel (Fig. 2b). The MDCT scan provided no further information about the cystic lesion. Because the complaints of the patient significantly regressed within hours, the patient was enrolled into follow-up. On the control US obtained the next day, the lesion appeared to have a reduced size (8 cm) and to have switched position downwards. After 48 hours, the complaints of the patient significantly increased, so emergent surgery was performed.

Intraoperatively, our patient was found to have malrotation with midgut volvulus and a large cystic mass. The mesentery was detorsioned 540 degrees in a counter-clockwise fashion, including the mesenteric vein, mesenteric artery, and lymphatic ducts. The lymphatic ducts were severely dilated. After derotation of the midgut, the small bowel was placed at the right side of the abdomen, and the colon was placed at the left side. All the intestines were viable, and no bowel resection was required. Preoperatively, on the other hand, the cystic mass in the lower right quadrant was found to have a soft constitution, smooth contours, and a slightly reduced size. The cystic mass was left in its place after a biopsy sample was obtained. The pathological evaluation of the cystic mass indicated that it contained abdominal lymphatic material (Fig. 3). On the control US obtained after one month, the cystic lesion appeared to have regressed and then completely resolved.

Discussion

MDCT can be very useful in the diagnosis of midgut volvulus. MDCT is a fast and technically easy way to fully assess patients with midgut volvulus. The characteristic appearance of a twisted mesentery, collapsed small bowel loops, and mesenteric fat wrapping around the SMA is pathognomonic and is commonly referred to as the “whirl sign” or clockwise whirlpool sign [3-6]. In our case, intestinal obstruction at the duodenojejunal junction, dilated duodenum and stomach, and the whirl sign were depicted on MDCT. In addition, an 11-cm heterogeneous, semi-solid cystic mass in the right lower quadrant of the abdomen was depicted by ultrasonography. In this case, the MDCT scan

Fig. 1 — The ultrasound study demonstrates a semi-solid cystic mass that has heterogeneous echogenicity and is 11 cm in size.
was performed to obtain further information for a differential diagnosis of the cystic lesion; however, no further information was obtained.

In older children, the symptoms of malrotation with volvulus are usually atypical and vague, resulting in delayed diagnosis [7,8]. In patients with chronic and recurrent volvulus, chronic venous congestion with lymphatic engorgement may occur [8]. Interference with lymphatic drainage may result in formation of a lymphangioma or a chylous mesenteric cyst [7]. In our case, because of the intestinal lymphatic torsion, there was cystic lesion mimicking a mesenteric cyst or a cystic mass.

Mesenteric lymphatic vessels, which are very small, unite to form the intestinal trunk, which enters the cisterna chyli. The intestinal trunk receives the lymph from the stomach, intestine, pancreas, spleen, and liver. The size of the intestinal lymphatic vessels varies markedly depending on whether the patient is fasting [9]. Intestinal lymphangiectasis is characterized by tortuosity and marked dilatation of mesenteric lymphatic vessels. Dilatation of the lymphatic vessels and of the cisterna chyli may be observed after surgical ligation of the thoracic duct during gastric or esophageal surgery [10]. Our patient had a large multicystic lesion that accompanied mesenteric torsion and was located in the right lower quadrant. In the light of the above information, we hypothesized that the marked lymphatic dilatation due to mesenteric torsion in our patient was mimicking a mesenteric cyst or cystic mass. After the torsion was corrected through surgery, the control US showed that the cyst disappeared on its own accord, and the biopsy results indicated lymphatic material. These findings are supportive of our hypothesis.

To our knowledge, this is the first case of midgut volvulus accompanied by large mesenteric lymphangiectasis to be depicted by MDCT.

In conclusion, the lymphatic ducts are also torsioned with the mesenteric vein, the artery, and intestinal loops in midgut volvulus. Giant lymphangiectasis secondary to lymphatic torsion may accompany midgut volvulus and mimic a mesenteric cyst or cystic mass. In that case, lymphatic dilatation associated with volvulus should be considered during differential diagnosis.

Fig. 2 — Contrast-enhanced axial MDCT images show a hypodense non-enhanced multicystic mass in the right lower quadrant of the abdomen (a). Contrast-enhanced axial MDCT imaging shows the level of superior mesenteric vessels with characteristic clockwise twisting of the bowel, mesentery, and superior mesenteric vein around the axis of superior mesenteric artery (b).

Fig. 3 — At HE x 100 magnification, extremely enlarged lymphatic structures with lumens filled with eosinophilic content and congested vascular structures adjacent to the fibro-adipose tissue are observed.
Conflict interest statement The authors declare that they have no conflict of interest to the publication of this article.

References