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Imaging Findings of Hepatic Paragonimiasis : A Case Report

Hepatic paragonimiasis is a rare form of ectopic infestation caused by *Paragonimus*. We experienced a case of hepatic paragonimiasis that showed characteristic imaging findings. CT and MR images showed a cluster of small cysts with rim enhancement in the subcapsular area of the liver. This finding seems to be characteristic for hepatic paragonimiasis, considering imaging findings in paragonimiasis involving other organs.

Key Words : *Liver abscess; Tomography, X-ray Computed; Magnetic Resonance Imaging; Diagnostic Imaging; Paragonimiasis*

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INTRODUCTION

Paragonimiasis is a parasitic infestation caused by the lung fluke, *Paragonimus westermani* and related species. After ingested, juvenile worms of *Paragonimus* migrate to the lung via tortuous tracks (1). For this reason, although primary site of paragonimiasis is the lung, ectopic infestation can occur in unexpected sites such as the brain, subcutaneous tissue and muscles, omentum and mesentery, retroperitoneum, adrenal glands, ovary, epididymis and liver (1-13).

Liver is known to be an organ in which ectopic paragonimiasis rarely occurs, and to our knowledge, only several cases of hepatic paragonimiasis have been reported in English and Korean literatures (3, 7-11). In this case report, we described CT and MR findings of a case of hepatic paragonimiasis that showed characteristic imaging features.

CASE REPORT

A 42-yr-old man visited our hospital with chronic cough, bloody sputum and weight loss of 5 kg for one year. He had a history of ingesting undercooked freshwater crabs at times.

Chest CT scan showed a 2-cm, well-circumscribed nodule in the left upper lobe (Fig. 1). This nodule appeared to consist of clustered cysts. Several smaller nodules were additionally found in the periphery of both lungs. Liver CT scan at the arterial phase showed a cluster of small, rim-enhancing cysts at the subcapsular area of the segment VII and wedge-shaped enhancement of adjacent parenchyma (Fig. 2). Hepatic capsular enhancement and pleural thickening were also noted, adjacent to hepatic parenchymal lesion. At liver MRI, the lesion appeared low signal intensity on T1-weighted images and bright signal intensity on T2-weighted images, indicating cystic nature (Fig. 3).

Laboratory data including peripheral blood examination and blood chemistry revealed to be in normal range, and stool examination for various parasitic eggs was also negative. But sputum cytologic examination revealed a few *Paragonimus* eggs. Transthoracic needle biopsy was performed under CT guidance for histologic confirmation of the lung lesion. The biopsied specimens were obtained as yellowish and black pieces and were histologically diagnosed as chronic granulomatous inflammation with *Paragonimus* eggs (Fig. 4).

He was treated with praziquantel with an oral dose of 75 mg/kg/day for 3 days, and gradually improved clinically. At follow-up CT scan 6 months after treatment, the hepatic lesions disappeared completely (Fig. 5). The main pulmonary nodule in the left upper lobe showed a marked decrease in size, while most of smaller nodules resolved completely.

DISCUSSION

Human infestation by *P. westermani* occurs from ingestion of raw or incompletely cooked freshwater crabs or crayfish infected with metacercariae. The ingested metacercariae excyst in the upper intestine and penetrate into the abdominal cavity. The juvenile worms migrate into the abdominal muscles and lodge there for 5-7 days and come back into the abdominal cavity. About 2-8 weeks after infestation, they migrate through the diaphragm and the pleural cavity, and finally reach the lung where they become mature adult worms. During the peritoneal stage, the juvenile worms often cause damage to the liver capsule and parenchyma (1).

Clinically, liver involvement by *Paragonimus* has known to be rare. But in an experimental study reported by Hu et al. (12), the frequency of hepatic involvement was higher than expected. They fed metacercariae of *P. westermani* to dogs and found adult worms in the liver 3 to 49 days after ingestion. The number of adult worms found in the liver was correspondent to 5 percent of the ingested metacercariae. And they also found *P. skrjabini* infection caused hepatic damage in all laboratory animals used. The cause of discrepancy between the incidence of hepatic paragonimiasis and frequency of hepatic damage in the experiment has not been explained.

The diagnosis of paragonimiasis is usually made by detecting eggs in sputum and/or stool or by antibody test. The imaging studies may increase the confidence of the clinical diagnosis and demonstrate the extent of involvement. Moreover, definitive diagnosis can be led only by imaging studies, if we are intimate to the characteristic findings of paragonimiasis, and thus allowing to avoid invasive procedure such as biopsy.

In the review of previously reported CT findings, hepatic paragonimiasis was commonly seen as multiple low attenuating lesions which might be scattered or clustered (3, 7, 13). In two case reports, it manifestated as a single, low attenuating lesion mimicking solid mass and mandated surgical resection (8, 9). On the other hand, hepatic paragonimiasis might be concomitantly found with intrahepatic cholelithi-

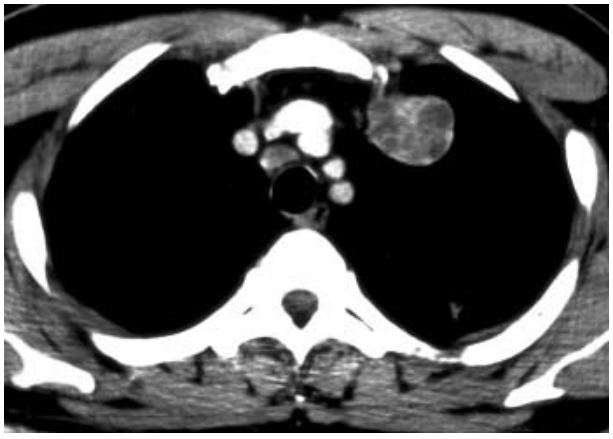

Fig. 1. Contrast-enhanced CT of the chest shows a well-circumscribed nodule composed of clustered cysts in the left upper lobe.

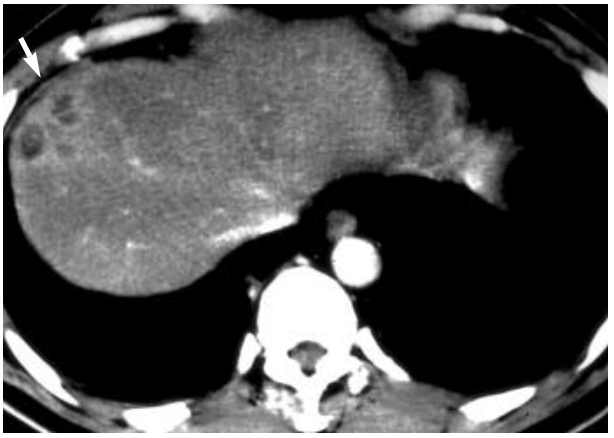

Fig. 2. Contrast-enhanced CT of the liver shows a cluster of rim-enhancing, small cysts at the subcapsular area of the segment VII. Note mild enhancement of the hepatic capsule and pleural thickening (arrow) adjacent to the hepatic lesion.

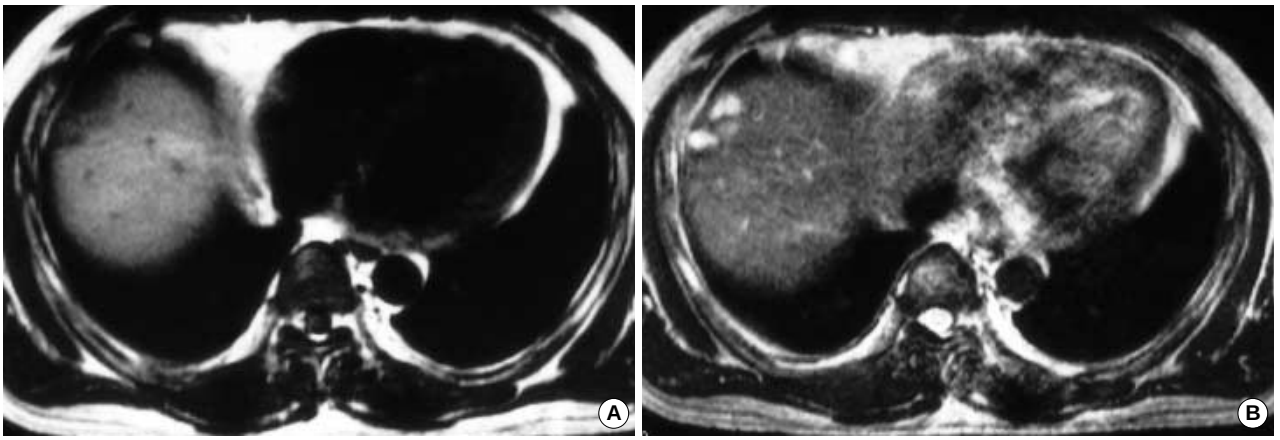

Fig. 3. MRI of the liver demonstrate a low signal intensity lesion on T1-weighted image (A) at the same site as that at CT and a cluster of small bright signal intensities on T2-weighted image (B), suggestive of cystic nature.

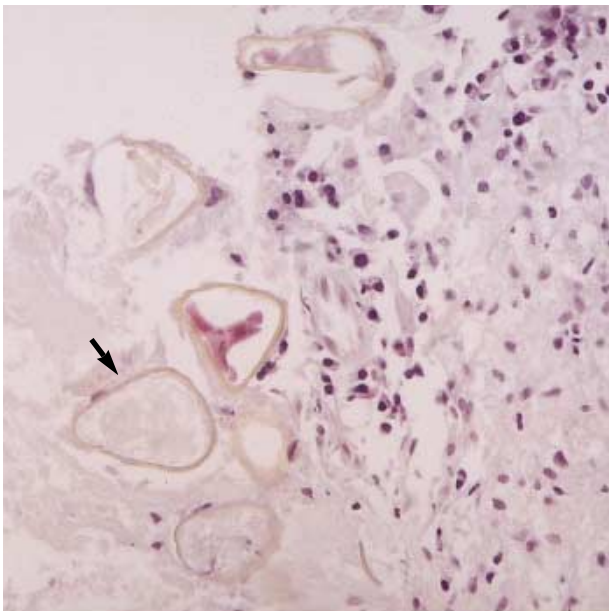

Fig. 4. Photomicrograph of a specimen obtained by lung biopsy reveals *Paragonimus* eggs (arrow) of 90×40 μm in size, with chronic granulomatous inflammation (H-E stain, ×200).

asis and incidentally diagnosed by hepatic resection (11).

In the present case, hepatic paragonimiasis manifestated as a cluster of rim-enhancing cysts, which was similar to the findings of cerebral (2) or pulmonary paragonimiasis (14). In abdominopelvic cavity, similar CT appearances were reported in cases involving the liver, omentum (3) and retroperitoneum (5). The CT and MR imaging features of clustered, rim-enhancing cysts are reflections of eosinophilic abscesses containing necrotic debris and *Paragonimus* eggs histologically (2). Hepatic capsular enhancement and wedge-shaped perilesional enhancement at CT scan can be explained due to inflammatory changes, according to the previously reported microscopic examination in which acute inflammation of the hepatic capsule and adjacent parenchyma were described to be seen adjacent to eosinophilic abscess (12). The peripheral location of the lesion reflects that the worms invade into the liver through the capsule and reside around the capsule rather than in the deep portion, as demonstrated by experimental studies in which metacercariae were present near to the surface in hepatic paragonimiasis (12, 15).

When a cluster of small, rim-enhancing cysts at the subcapsular location in the liver is encountered at CT or MR imaging, the differential diagnoses include fascioliasis and pyogenic abscesses. In fascioliasis, eosinophilic microabscesses are arranged in tract-like fashion with one end of the tract subcapsular in location. And concomitant lung and pleura involvement is more common in hepatic paragonimiasis than in fascioliasis (16). Cystic lesions caused by *Paragonimus* do not coalesce while clusters of microabscesses coalesce into a larger abscess cavity in pyogenic abscess. And pyogenic abscess has no preponderance of the subcapsular area.

Fig. 5. Contrast-enhanced CT of the liver after praziquantel treatment demonstrates complete disappearance of parenchymal lesion in the right lobe.

As shown in the present case, hepatic paragonimiasis has its own characteristic findings at CT or MRI. Thus, knowledge of these findings is helpful in differentiating various cystic lesions found in the liver.

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