

The investigation of clinical and radiological findings of hepatic alveolar cyst hydatid disease

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Abstract

Aim: The aim of this study is to investigate the clinical and radiological findings of hepatic alveolar hydatid cyst diagnosed in our clinic.

Material and Methods: Records of patient files with histological diagnosis of hepatic alveolar hydatid cyst between March 2013 and February 2018 were retrospectively reviewed. Fifteen cases were included in the study. Nine of the cases were males (60 %) and 6 were females (40 %). Their ages ranged from 27 to 62 with a mean age of 41 ± 7.3 years. Clinical and laboratory findings and radiological imaging findings of the cases were investigated and recorded.

Results: The most common symptoms were right upper quadrant pain (75 %), jaundice (24 %), fever (13 %) and weight loss (12 %). The most common finding in physical examinations was hepatomegaly (96 %). AST, ALT, and ALP values increased 3-4 times. Bilirubin values were generally increased (0.8-21.2 mg/dL). Abdominal ultrasonography (US) was described as a mass lesion with irregularly border, heterogeneous echogenicity, which consisted of the most solid component. It was located in the right liver lobe (82 %). Multislice Computed Tomography (MSCT) and Magnetic Resonance Imaging (MRI) findings supported the US findings. There was no contrast material involvement in the lesion. Diffusion MRI showed mild diffusion restriction somewhere.

Conclusions: Alveolar echinococcosis frequently confused with other malignant liver lesions. Early diagnosis of the disease is very important in terms of treatment. Immunologic tests and biopsy are helpful in diagnosis. Radiological findings have an important role and contribution in the diagnosis of the disease.

Keywords: Echinococcosis Multilocularis; Liver; Multislice Computed Tomography; Magnetic Resonance Imaging.

INTRODUCTION

Echinococcosis multilocularis is a rare parasitic disease. It can often involve various organs, especially the liver.

There is insufficient knowledge about the liver involvement due to this parasite in humans. Liver involvement of parasite can be life-threatening, especially when the diagnosis is delayed. Immunologic tests and biopsy are helpful in the diagnosis.

Radiological findings have an important role and contribution in the diagnosis of the disease (1,2). Radical surgery is performed in appropriate cases. Following the surgery, medical treatment is done for a while. Liver transplantation is a life-saving in the treatment in the presence of hepatic hilum involvement, bile ducts and vascular invasion where liver resection or surgical treatment is very difficult.

In this article, we investigated the clinical presentation and radiological findings of the hepatic alveolar hydatid cyst.

MATERIAL and METHODS

After obtaining an approval for the study from the Institutional Ethics Committee of University, records of patient files with histological diagnosis of hepatic alveolar hydatid cyst between March 2013 and February 2018 were retrospectively reviewed. Fifteen cases were included in the study. Nine of the cases were males (60%) and 6 were females (40%). Their ages ranged from 27 to 62 with a mean age of 41 ± 7.3 years. Clinical and laboratory findings and radiological imaging findings of the cases were investigated and recorded. The study was conducted in accordance with the principles of the Declaration of Helsinki.

MSCT examination

All patients were examined by MSCT using a Toshiba Aquilion 64 Toshiba Medical Systems, Tokyo, Japan. The scanning area was identified between the diaphragm and the iliac crest. Images were of kVp 120, mAs 150-200 value, and 0.5 mm collimated cross-section thickness,

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0.5 mm reconstruction interval, diameter FOV (30 cm), and with a pitch value between 1-1.5. Investigations were initiated one hour before the examination every 15 min, following totally 1000–1500 mL oral consumption of water. All examinations were performed with the patients in the supine position and automatic injection of 1mL/kg iopromide or iohexol at a rate of 3 mL/sec through the right antecubital vein, through single breath-holding at 65 sec.

MRI examination

The 1.5T (Ingenia, Philips) MRI device was used for MRI analysis. All patients were analyzed using the 32-channeled body coil and under respiratory monitoring. Diffusion analyses were performed on all patients with the b 400 and b 1000 values, and ADC mappings were obtained from these analyses. The ADC mappings and other measurements were performed by a radiologist with experience in abdominal radiology.

The following parameters were used in the T2A fast spin-echo images obtained from the patients: Matrix: 288x251, Number of Excitations (NEX): 1.0, Field of view (FOV): 40x35 cm, cross-sectional thickness: 5 mm, space between cross-sections: 0.5 mm, Repetition Time (TR): 441 msn, TE: 80 msn.

The following parameters were obtained from the DW images: Matrix: 132x114, Number of Excitations (NEX): 2.0, Field of view (FOV): 40x35 cm, cross-sectional thickness: 5 mm, space between cross-sections: 0.5 mm, Diffusion direction: All directions, Repetition Time (TR) and Echo Time (TE): minimum.

A dynamic series consisted of one pre-contrast series followed by early arterial, late arterial and portal phase imaging with 32-second intervals for the start of each phase imaging.

RESULTS

The most common symptoms were right upper quadrant pain (75%), jaundice (24%), fever (13%) and weight loss (12%) during admission to the clinic. The most common finding in physical examinations was hepatomegaly (96%). Abdominal ultrasonography (US) was also described as a mass lesion in the range of 8-23 cm size with irregularly border, heterogeneous echogenicity, which consisted of solid (88%), cystic (11%) and calcific areas (7%). Most of the cases were located in the right liver lobe (82%). Table 1 shows the primary characteristics of the patients. In the laboratory study, AST, ALT and ALP values increased 3-4 times. Bilirubin values were generally increased at different values (0.8-21.2 mg/dL) (Table 2).

Table 1. Primary characteristics of hepatic alveolar hydatid cyst	
Duration of symptoms	1 month to 3 years
Clinical presentation	Abdominal pain, jaundice, fever
Physical examination	Hepatomegaly and liver mass
Lobe or involvement	Right lobe
Size	8-23 cm

Table 2. The laboratory studies: AST, ALT, and ALP values	
BILIRUBIN	0.8 to 21.2 mg/dL (6.9±9.2)
ALT, IU/L*	13 - 243 IU/L (71.8±79.3),
AST, IU/L**	22 - 272 IU/L (81.43±83.4)
ALP, IU/L***	82- 1421 (512.7±578)
*ALT, Alanine aminotransferase (normal < 28 IU/L)	
**AST, Aspartate aminotransferase (normal< 28 IU/L)	
***ALP, Alkaline phosphatase (normal< 150 IU/L)	

MSCT and MRI findings supported the US findings. The present appearance of MSCT images was a hypodense solid mass with an infiltrative characteristic. There was a no evidence of contrast enhancement (Figure 1a,b). On MRI, there was a hypo intense signal in the lesion with T1A and T2A images (Figure 2).

Diffusion MRI showed mild diffusion restriction (Figure 3). Contrast-enhanced MRI examination showed no contrast material involvement in the lesion (Figure 4a,b).

In a small number of cases lymph nodes were present in the para-aortic area (2%). The diagnosis of the all cases was confirmed with histopathological examination.



Figure 1. Axial (a) and coronal (b) upper abdominal MSCT scan with contrast enhancement showing hypodense solid liver mass with an infiltrative characteristic. There was a no evidence of contrast enhancement (arrows).

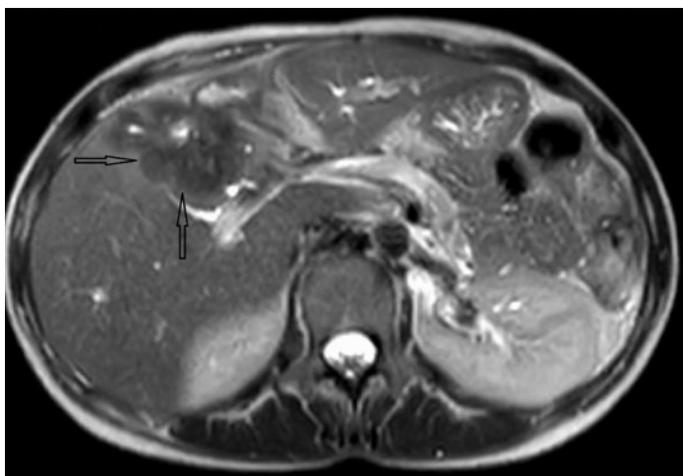


Figure 2. On Axial T2 MR Image, there was a hypointense signal in the lesion (arrows).

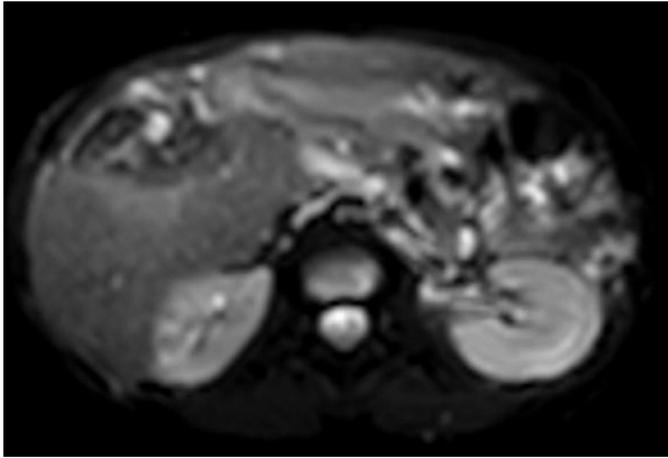


Figure 3. Diffusion MRI showed mild diffusion restriction.

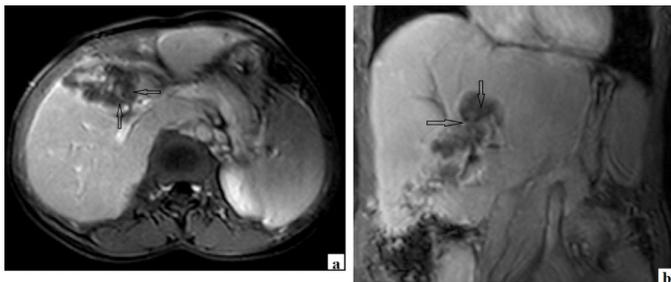


Figure 4. Axial (a) and coronal (b) Dynamic MR Image shows no arterial contrasting in the mass (arrows).

DISCUSSION

Alveolar echinococcosis is a parasitic disease with activated from *Echinococcus multilocularis*. It was seen rarely in the liver (3%). Progression of disease is slowly. There is a large infiltration associated with invasive and destructive changes mimicking a malignant neoplasm in the tissue (3,4). Hepatic hilum infiltration is seen 50% of patients approximately. It results in dilatation of the intrahepatic bile ducts, portal veins and branches, and invasion of the hepatic veins. Although there are no typical radiological findings, US findings also may be useful in the diagnosis. Granular calcification areas, hypoechoic areas (2 cm or less), irregular contours and boundaries, broad necrosis areas are can be seen in the abdominal US (5,6). As the lesions progress, they appear as masses with central necrosis, reaching large sizes. There may be a large number of irregular poorly edged hypodense lesions that commonly involve liver tissue in MSCT, as well as in the appearance of hypodense masses reaching advanced dimensions. Lack of contrast enhancement or poor involvement is a characteristic for parasitic lesion (1,2). Apart from typical peripheral irregular calcification, large homogenous, numerous point and scattered calcifications may also be seen. In particular, the demonstration of small calcified calcifications has a large precaution (7). MRI findings have been described in the literature (8). The fibrous and parasitic tissue boundaries that are observed as hypo intense on T1- and T2-weighted images can be clearly shown.

Massive necrosis is easily detected as hyper intense on T2-weighted images. In T2-weighted images, less than 10 mm in focal areas with peripheral parasitic cysts, corresponding to the active segments of the lesion. In MRI, these vesicles are better seen than MSCT. Diffusion MRI shows mild diffusion restriction in somewhere (9,10).

The diagnosis of the disease is done via serological tests, imaging techniques, and also percutaneous biopsy. Atypical lesions encountered in the liver may be typical radiological findings in endemic areas. The presence of small vesicles scattered within or around a lesion is typical histopathologically. Metastases, primary hepatic neoplasms, less likely Caroli disease, mucinous carcinoma, and hepatic actinomycosis should be considered in the differential diagnosis of large lesions with low-attenuated small areas (10).

In treatment, radical surgery is performed in appropriate cases (11). Following this, medical treatment is continued for a while (12). Liver transplantation is a life-saving in the treatment with hepatic hilum involvement, bile ducts and vascular invasion where liver resection or surgical treatment is difficult (13).

CONCLUSION

In conclusion, Alveolar echinococcosis mimics malignancy and also is frequently confused with other malignant liver lesions. It has an infiltrative pattern. In most cases, diagnosis is delayed and diffuse lesions may be present during the diagnosis. Primary lesion causes liver failure; also complications of metastatic lesions can be lead to mortality. Early diagnosis of the disease is very important in terms of treatment. Radiological findings have an important role and contribution in the diagnosis of the disease.

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REFERENCES

1. Akin O, Isiklar I. Hepatic alveolar echinococcosis. *Acta Radiol* 1999;40:326-8.
2. Choji K, Fujita N, Chen M, et al. Alveolar hydatid disease of the liver: computed tomography and transabdominal ultrasound with histopathological correlation. *Clin Radiol* 1992;46:97-103.
3. Pohnan R, Ryska M, Hytych V, et al. Echinococcosis mimicking liver malignancy: a case report. *Int J Surg Case Rep* 2017;36:55-8.
4. Caire Nail L, Rodríguez Reimundes E, Weibel Galluzzo C, et al. Disseminated alveolar echinococcosis resembling metastatic malignancy: a case report. *J Med Case Rep* 2017;11:113.
5. Barosa R, Pinto J, Caldeira A, et al. Modern role of clinical ultrasound in liver abscess and echinococcosis. *J Med Ultrason* 2017;44:239-45.
6. Cai DM, Wang HY, Wang XL, et al. Ultrasonographic findings of small lesion of hepatic alveolar echinococcosis. *Acta Trop* 2017;174:165-70.
7. Sade R, Kantarci M, Genc B, et al. Computed tomography perfusion imaging for the diagnosis of hepatic alveolar echinococcosis. *Eurasian J Med* 2018;50:1-5.
8. Claudon M, Bessieres M, Regent D, et al. Alveolar echinococcosis of the liver: MR findings. *J Comput Assist Tomogr* 1990;14:608-14.

9. Zheng J, Wang J, Zhao J, et al. Diffusion-Weighted MRI for the initial viability evaluation of parasites in hepatic alveolar echinococcosis: comparison with positron emission tomography. *Korean J Radiol* 2018;19:40-6.
10. Sade R, Kantarci M, Ogul H, et al. Differentiation between hepatic alveolar echinococcosis and primary hepatic malignancy with diffusion-weighted magnetic resonance imaging. *Diagn Interv Imaging* 2018;99:169-77.
11. Qu B, Guo L, Sheng G, et al. Management of Advanced Hepatic Alveolar Echinococcosis: Report of 42 Cases. *Am J Trop Med Hyg* 2017;96:680-5.
12. Fattahi Masoom SH, Lari SM, Fattahi AS, et al. Albendazole therapy in human lung and liver hydatid cysts: a 13-year experience. *Clin Respir J* 2018;12:1076-83.
13. Aliakbarian M, Tohidinezhad F, Eslami S, Liver transplantation for hepatic alveolar echinococcosis: literature review and three new cases. *Infect Dis* 2018;50:452-9.