

Case Report

Hepatobiliary Fascioliasis: Clinical and Radiological Features

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Abstract

Fascioliasis is a worldwide but unevenly distributed zoonosis caused by the trematode *Fasciola hepatica* that infects domesticated herbivores. Fasciolosis also occurs accidentally in humans by ingestion of metacercaria-laden freshwater or water plants. Human infections are common in developing countries and are not rare in Europe. The clinical course has been conventionally described in two phases: an acute phase of hepatic parenchymal invasion of an immature worm larva (parenchymal phase) and a stationary phase after residence in the bile duct and production of eggs (ductal phase). We report a 34 years old woman from Ilam, western Iran with hepatic disorder, RUQ pain, and jaundice. The diagnosis was made by sonography, CT scan and serologic studies. Serologic exam (ELISA) was positive & CT findings were compatible with fascioliasis.

Keywords: *Fasciola hepatica*, Liver, Imaging, Iran

Introduction

Fascioliasis is a rare zoonotic disease, caused by the sheep liver fluke *Fasciola hepatica*. Infection results from ingesting uncooked watercress and other fresh aquatic vegetation in many countries worldwide, especially in sheep & cattle-raising areas. The global prevalence of human infection is in excess of 3 million (1). Infections have been reported from all continents except Antarctica (1). Most of the cases in humans have been reported from South America (Bolivia and Peru), Africa (Egypt), Australia, Mediterranean countries, Germany, England, Portugal, France and China, that have significant sheep and livestock industries (1-3).

Iran is also one of the countries that this disease has been reported with the highest rate. There had been well described outbreaks of human fasciolosis in northern parts and a small one in Kermanshah, western part, during 1988-1989 and 1999 (4-8). In general, the geographic

prevalence of the human disease is parallel to endemic animal illness. The disease mainly involves the hepatobiliary system and manifests in 2 stages: hepatic (acute, invasive) and biliary (chronic). Obstructive jaundice and recurrent cholangitis may occur in the biliary stage.

In contrast to the extensive studies about fasciolosis in the other medical fields, radiologic findings of human fasciolosis have been described only sporadically in a few reports (9-13). In the parenchymal phase (an acute phase of parenchymal invasion of a larva), CT shows subcapsular clustered areas of low attenuation (14). MRI findings of disease have been reported in only two cases. MRI appearance is similar in shape but better than CT in characterizing the hemorrhagic nature of the lesion. Ultrasound findings are nonspecific in this shape. In the ductal phase (a stationary phase after residing in the bile duct), CT shows dilatation of central ducts with symmetric periportal hypo attenuation (peripheral tracking). MRI can not depict

mild ductal dilatation. Ultrasound is most valuable in demonstrating the moving worm within bile duct.

This article explains the availability & features of radiological imaging in diagnosis of fascioliasis.

Case report

A 34 year-old woman from Ilam, western in Iran was admitted in infectious ward of Loghman Hospital due to RUQ pain, jaundice, weight loss and hepatomegaly. In another center, lymphoma was suggested for patient but liver biopsy and laparotomy were negative for malignancy and lymphoma.

When she was admitted, the hemoglobin level was 11.8 gr/dl, the white-cell count was $8300/\text{mm}^3$ with 85 percent eosinophils, the platelet count was $248000/\text{mm}^3$. Elevated bilirubin and hepatic enzymes were seen in blood exam (ALT: 189 U/lit, AST: 167 U/lit, Alk-ph: 874 U/lit, Bil-T: 18.2mg/dl, Bil-D: 11.2 mg/dl). According to the history, physical examination & lab data, helminthic diseases were suggested. In serologic

examination using ELISA, the titer of *Fasciola* antibody was positive (1: 1028). At this time in ultrasonography, multiple moving echogen foci without acoustic shadow were seen in gallbladder with thickened dilated bile ducts. These findings were compatible with biliary phase of fascioliasis. (Fig.1 and 2)

The first abdominal and pelvic CT scan with contrast showed multiple small discrete hypodense bizarre shaped lesions in peripheral part of liver which was dominant in right lobe. (Fig. 3) These lesions were scattered around peripheral branches of portal veins. These findings were compatible with hepatic phase of fascioliasis. Another CT scan after six months showed that these lesions were changed to tubular shape in central part of liver in dilated biliary tree.

The patient was treated with triclabendazole 10 mg/kg (Tab 250 mg). The patient returned to her usual state of health, and all her symptoms resolved within two weeks after triclabendazole therapy was begun. At a six month follow-up examination, her eosinophil count and the results of liver-function tests were normal.





Fig. 1: first abdominal and pelvic CT scan with contrast multiple small discrete hypodense bizarre shaped lesion were seen in periphery of liver with promiancy in right lobe

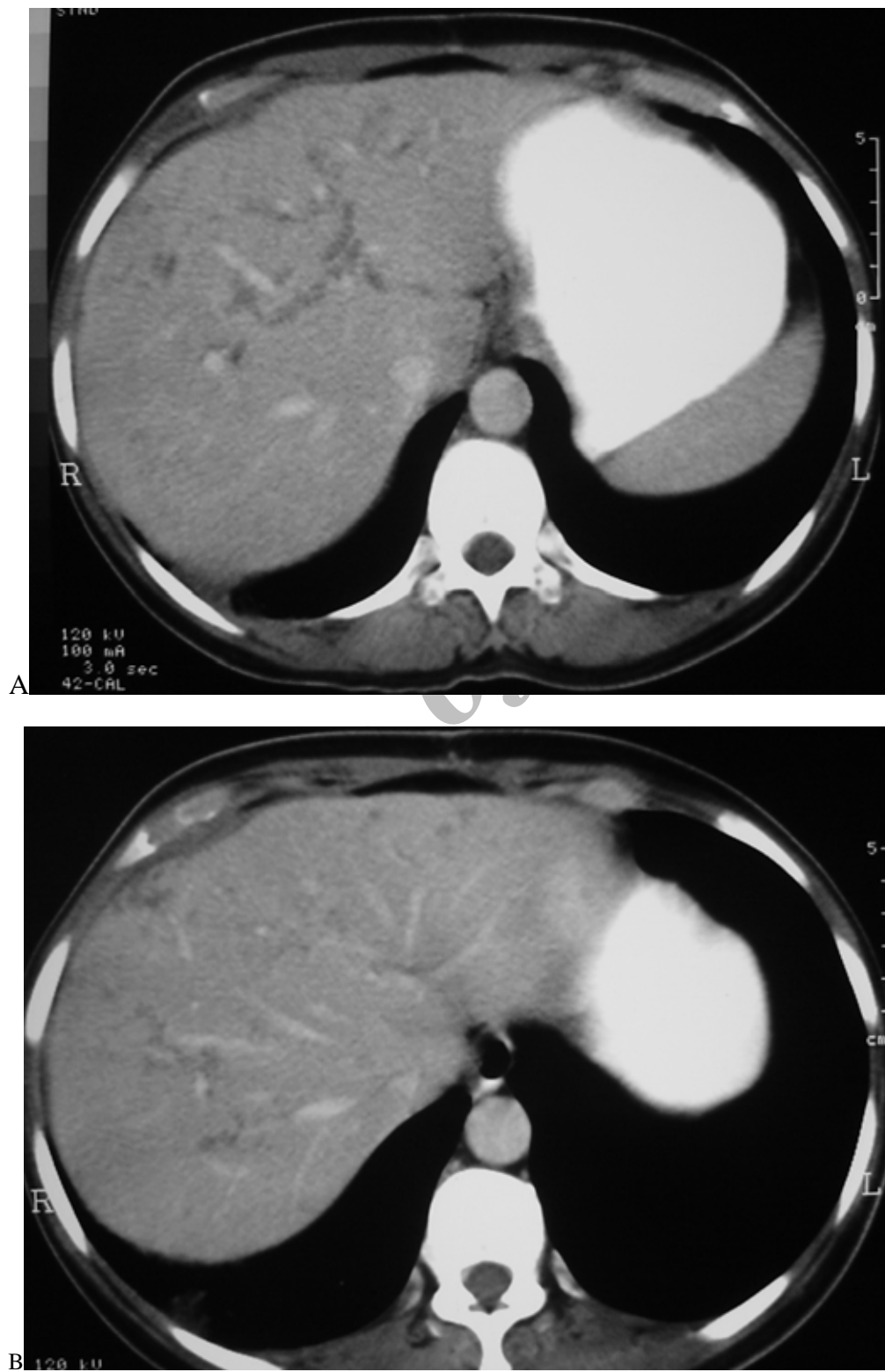


Fig. 2: In CT scan after six month hypodence hepatic lesions were changed to tubular shape in central part of liver in dilated billiary tree.

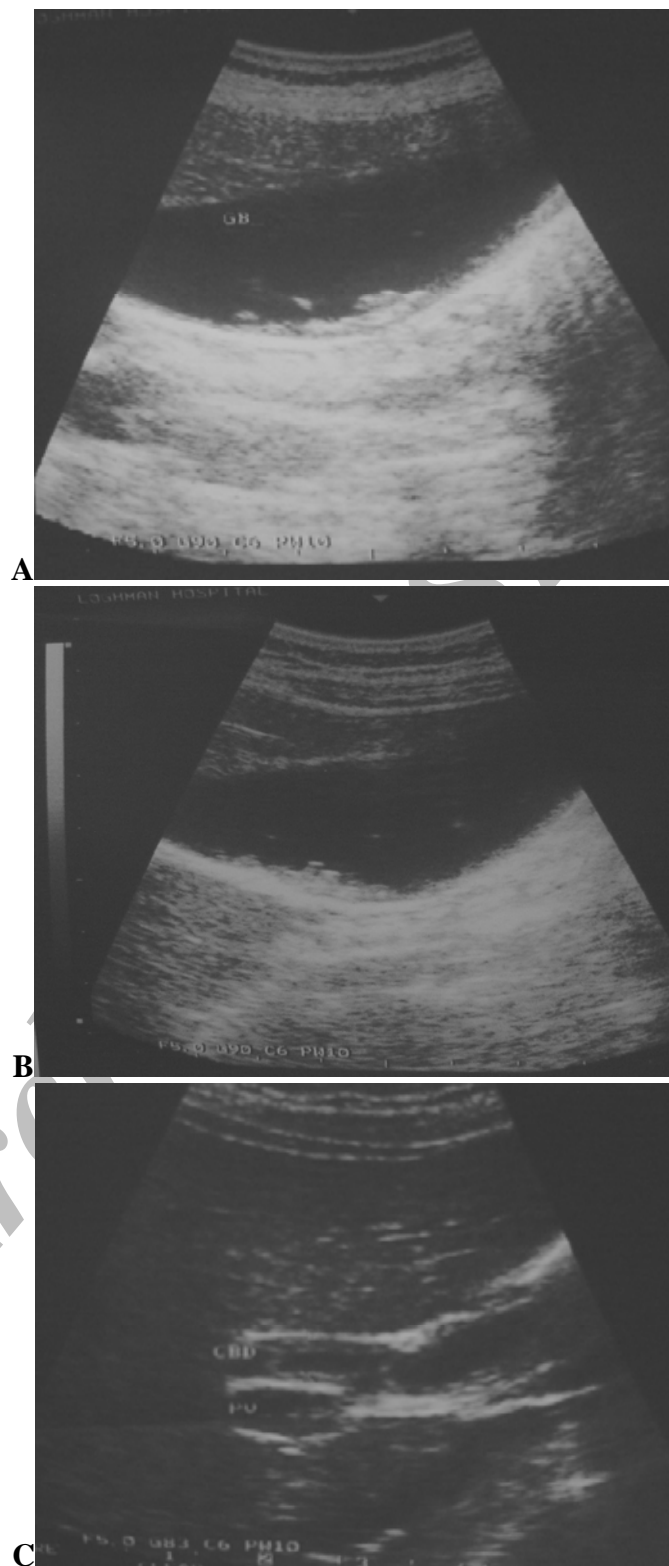


Fig. 3: ultrasonograophy six month after beginning of disease shows, multiple moving echogen foci without acoustic shadow were seen in gallbladder with thickened dilated bile ducts. These findings compatible with billiary phase of FH

Discussion

Human fasciolosis infection with the sheep liver fluke is a worldwide illness. Despite the fact that infection is a major veterinary problem, humans are accidental hosts in the reproductive cycle of the parasite (15). Ectopic migration to the lungs, pleura, heart, pericardium, abdominal wall, epididymis, or brain may also occur (10, 16).

Symptoms during acute stage of disease occur in 80 to 90 percent of patients and include intermittent fever, abdominal pain, weight loss, headache, and itch or urticaria. There may be tender hepatomegaly and normal or minimally elevation of liver enzymes. The levels of hepatic enzymes may be normal or abnormal in spite of biliary obstruction in all patients jaundice is not always present (17). Various findings from mild hepatitis to severe subcapsular hemorrhage, overt necrosis, hemobilia, and hepatic mass have been described for this disease (17-19).

Serology is helpful in the diagnosis of fasciolosis, especially during acute infection because symptoms develop 1 to 2 months before eggs are detectable in the stool (1). The method most widely used is the enzyme-linked immunosorbent assay (ELISA). The assay detects antibodies to the excretory-secretory antigen products from whole worms. Sensitivities of more than 90% are reported, but the specificity may be less owing to cross-reactivity with other helminths (1). The number of eggs in the feces is scanty, and fewer than 35% of the cases of chronic fasciolosis are diagnosed by parasitic stool tests (20). Kabaalioglu *et al.* described the radiologic features of 23 *F. hepatica* patients (21). Although both ultrasonography and CT are very helpful diagnostic tools, ultrasonography especially provides useful information (22).

Hepatic lesions are produced by migration of the trematodes through the liver and predominate in the invasive stage. Histologically, they

correspond to microabscesses and tunnel-like areas of parenchymal necrosis (23).

Adult flukes, either due to a direct irrigating effect or perhaps to the induction of a high proline concentration in the bile, promote hyperplasia and hypertrophy of the duct epithelium and enveloping periductal fibrosis, resulting in thickening of the duct walls (24). Flukes in the gallbladder as mobile vermiform structures without acoustic shadowing may also be demonstrated by ultrasound (in 4 patients of 9) and CT (22, 25). One finding, both interesting and highly specific, was that dilated common bile duct and bile ducts were filled with non shadowing material isoechoic to the liver. As far as we know, this finding has not been reported previously. We think that this feature is related to the *Fasciola* flukes absolutely filling the bile ducts and highly suggestive of fasciolosis.

Ultrasonography is very helpful in the evaluation of treatment efficacy. Ultrasonography after the therapy shows either resolution or a decrease in the hepatic lesions and lymphadenopathies.

Characteristic parenchymal lesions are also clearly demonstrated at MR imaging. Magnetic resonance imaging reflects the extent of the lesions better than CT at the earlier stage (3-4 wk). In the late parenchymal phase (5-6 wk), the extent of the lesions on the specimens is well correlated with both CT scan and MR imaging. Microscopically, coagulation necrosis was predominant at the third week, whereas a portion of liquefaction is frequently seen at the sixth wk.

Magnetic resonance imaging shows a more detailed pathologic correlation. As with a human case detected with MR imaging (18) each nodule consisted of bright signal center, with a less hyperintense periphery on T2WMRI, and the peripheral portion showed ill-defined enhancement. The peripheral portion was correlated with eosinophilic inflammation surrounding the coagulation necrosis center.

Percutaneous needle liver biopsy reveals non-specific changes, Charcot-Leyden crystals, and

multiple calcification foci and rarely demonstrates *Fasciola* eggs or *F. hepatica* organisms (19).

The medical therapy for fasciolosis is difficult and unrewarding. Unlike infections with other flukes, fasciolosis responds poorly to praziquantel. First-line treatment is with a single oral dose of triclabendazole, a well tolerated benzimidazole used in veterinary practice that is highly effective against mature and immature flukes. Rates of cure are around 80%, (1) and persons not cured with a single dose usually respond to a second dose. Treatment should be repeated if radiographic findings or eosinophilia fail to resolve or the titers of serologic tests do not decrease. Alternative therapy is with bithionol, which causes frequent side effects and nitazoxanide with 60% cure rates (1). The chronic infection is more difficult to treat compared with the acute disease (26-28).

Because of the risk of biliary obstruction and related complications, such as cholangitis or pancreatitis resulting from dead flukes due to the drug therapy, endoscopic mechanical clearance of the bile ducts is mandatory in the biliary stage (29). In biliary obstruction due to *Fasciola*, endoscopic biliary sphincterotomy and extraction of *Fasciola* flukes by balloon or basket are very effective and safe interventions (30-32).

In conclusion, the diagnosis of hepatobiliary fascioliasis is based on a high index of suspicion. *F. hepatica* infection should be considered particularly in people living in or traveling to regions endemic for this disease when abdominal pain, fever, and eosinophilia are observed. Typical findings on ultrasonography, which should be absolutely performed as initial assessment procedure, facilitate the diagnosis. Sonography, MRI, CT scan, serology and typical ERCP findings confirm the diagnosis.

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