

# Fascioliasis In Cukurova Region, Turkey: Unnecessary Surgery In Endemic Areas

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## Abstract

*Fasciola hepatica* is a trematoda, which is rarely hosted in humans. The treatment is medical. In complicated cases, surgical and invasive attempts can be administered. It can be diagnosed through serologic and radiological tests. In this study, we investigated cases, half of which were exposed to invasive attempts due to lack of diagnosis though we were in the endemic region. In Cukurova University Hospital, 10 diagnosed *F. hepatica* cases were examined in retrospective. Invasive attempts were performed to 5 cases (50%) during pre-operative period, as serological examination was not made. Two cases were administered mass excision from the liver, segmentectomy to one case, cholecystectomy to 1 case, and T tube drainage, and percutan transhepatic cholangiogram and percutaneous transhepatic biliary drainage were applied to another case. The results suggest that serological methods must be used for diagnosis to avoid unnecessary invasive attempts in suspected cases, particularly in endemic areas.

## INTRODUCTION

*Fasciola hepatica* (*F. Hepatica*) is a trematoda (schistosoma) liver fluke, which infects primarily sheep, goats and cattle. Humans are only accidental hosts of *F. hepatica*<sup>1</sup>. The disease is acquired mostly by consumption of watercress-like vegetables or drinking water contaminated with metacercariae. Following ingestion, the larvae excrete and progresses through the gut wall into the peritoneal cavity toward the liver. Over a period of a few months, they penetrate the capsule and migrate to the bile ducts, where they remain<sup>2</sup>. The disease might be seen in various clinical forms differing from asymptomatic infections to liver failure. Human fascioliasis is defined in 2 periods. The acute stage of the disease is the period after larvae reaches to liver and proceeds onto bile ducts. This takes an average of 3 to 4 months. In hepatocytes, inflammation and necrosis is seen. The chronic period, on the other hand, is characterized by inflammation and fibrosis process in the main bile ducts after the parasite reaches the bile ducts, and the duration differs due to various latent periods<sup>1,3</sup>.

Turkey is an endemic country in terms of *F.hepatica*<sup>4</sup>. Cukurova is in the southern part of Turkey, situated by the Mediterranean Sea where the climate is hot and the region has vast irrigation lands. The aim of our research is to explicate 10 *F.hepatica* cases, 4 of which are surgical, and 1

post invasive attempt diagnosis.

## METHODS

10 *F. hepatica* cases, which had been diagnosed were analyzed retrospectively at Cukurova University Hospital between December 2000 - December 2006. Demographic data of patients (age, sex, symptoms, symptom durations, where the patient resides), laboratory findings, serological findings, diagnosis methods, treatment methods and recovery in follow-ups were noted. Patients were classified as acute and chronic stage patients according to symptom durations and radiological findings. All patients' sera samples were analyzed by fascioliasis serology and they were used for three different serological tests for this reason, Indirect haemaglobination (IHA), Enzyme Linked Immunosorbent Assay (ELISA) and Western-blot (WB), respectively. Also stool and/or bile were analyzed in each and every case.

## RESULTS

Cases consisted of 6 female and 4 males with an age average of 47 (11-65), 8 of whom (80%) resided in the rural parts in Cukurova and 2 acute stage patients (20%) resided in the city. Cases were classified according to the durations of symptoms and radiological findings. Those with symptom duration less than 4 months and whose radiological findings indicated no active suspicious images in the gal bladder or

main bile ducts were classified as acute stage whereas symptom duration exceeding 4 months and whose radiological findings indicated no active suspicious images in the gal bladder or main bile ducts were classified as chronic. 8 patients (80%) were in the acute, 2 patients were (20%) in chronic stages. Most frequently seen clinical symptoms, abdominal pain (7 patients 70%), fever (4 patients 40%), pruritus (4 patients 40%), nausea (2 patients 20%), right upper quadrant pain (2 patients 20%), jaundice (1 patient 10%), epigastria pain (1 patient 10%) and fatigue (1 patient 10%). The only case with jaundice was at the chronic stage. In terms of other symptoms, there was no significant difference between the groups. The demographic data from the cases, symptoms and duration classifications are summarized in Table I.

**Figure 1**

Table 1: Demographic data, symptoms and classification.

Cases	Sex	Age	Symptoms	Duration Of Symptoms (Month)	Place	Acute	Chronic
CASE 1	F	60	Jaundice, epigastric pain, fever, pruritus	5	Rural		X
CASE 2	F	57	Abdominal pain, fever, pruritus	2	Rural	X	
CASE 3	F	45	Abdominal pain, nausea	3	Rural	X	
CASE 4	M	11	Abdominal pain	3	Rural	X	
CASE 5	F	65	Right upper quadrant pain, fatigue	6	Rural		X
CASE 6	F	40	Abdominal pain, pruritus	2	Urban	X	
CASE 7	M	38	Abdominal pain, nausea	3	Rural	X	
CASE 8	M	46	Abdominal pain, pruritus	1	Urban	X	
CASE 9	F	52	Right upper quadrant pain, fever	1	Rural	X	
CASE10	M	56	Abdominal pain, fever	2	Rural	X	

In laboratory findings analysis, eosinophilia was seen in all cases. The average eosinophilia level was 30.5 % (18.2-65%) (with reference 0.9-6%), ALT 3 (30%), Ig E 6 (60%) was high levels at cases. As the average ALT level was 35.8 (21- 85) U/L (reference<41), the average Ig E level was 354.5 (120- 579) IU/ml (reference 10-180). In serology; IHA gave three false negative results but ELISA and WB serology gave positive results in all samples. Diagnostic data and laboratory findings are shown in Table II.

**Figure 2**

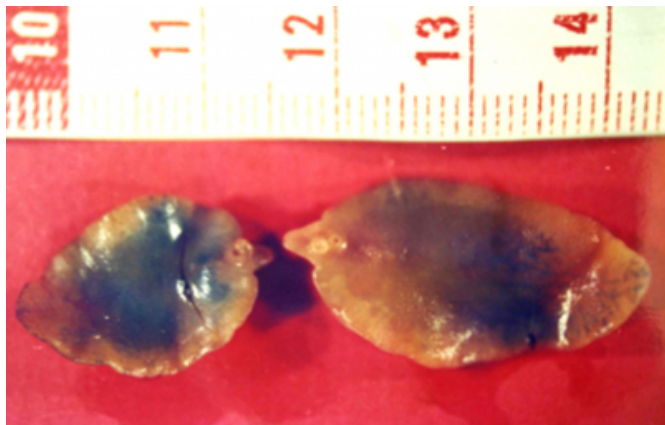
Table 2: Laboratory findings, serologic findings and diagnostic methods.

	ACUTE (n:8)	CHRONIC (n:2)
<b>Laboratory findings</b>		
Eosinophilia	8 (100%)	2 (100%)
Elevated ALT level	2 (25%)	1 (50%)
Elevated Ig E level	5 (62.5%)	1 (50%)
<b>Serologic findings</b>		
IHA	5 (62.5%)	2 (100%)
ELISA	8 (100%)	2 (100%)
Western blotting	8 (100%)	2 (100%)
<b>Diagnostic methods</b>		
Duodenal liquid	2 (25%)	
PTC- guided aspiration		1 (50%)
T- Tube aspiration		1 (50%)
Gaita	2 (25%)	
Liver ultrasound	5 (62.5%)	2 (100%)
Abdomen CT	5 (62.5%)	2 (100%)
Pathology	3 (37.5%)	2 (100%)
Serology	8 (100%)	2 (100%)

Five (62.5%) acute cases diagnosed with serological tests by ELISA and WB. Out of these 5 cases 2 were found out to exhibit lesions in the right lobe of the liver and the liver was tested serologically as well as under ultrasound. The remaining 3 of the acute stage cases were operated following pre-diagnosis of mass in the liver and in 2 cases mass excision was performed from the liver, and 1 case was applied segmentectomy. With the suspicion of F.hepatica at histopathological analysis stage these 3 patients were serologically examined, and the results were positive. Diagnosis was finalized, and single dose was treated with a single dose of triclabendazol 10 mg/kg. One of the chronic stage cases was hospitalized due to obstructive jaundice and acute pancreatic findings but had to be operated because of lack of a final diagnosis. During the operation parasite was extracted from ductus choledochus (Figure 1 and 2).

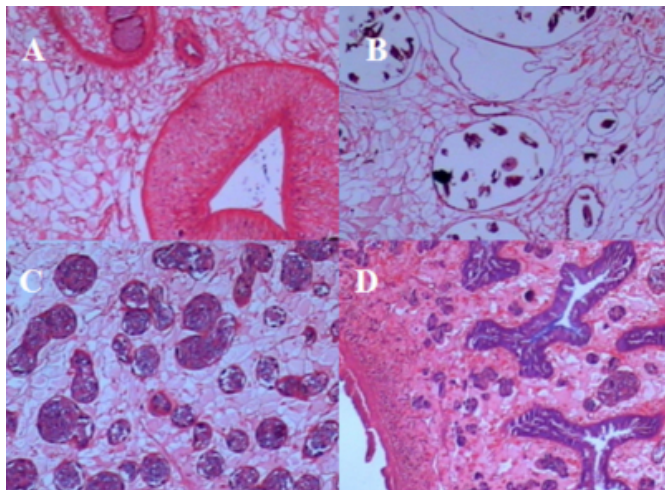
**Figure 3**

Figure 1: *F. Hepatica*



**Figure 4**

Figure 2. A microscopic view of *F. Hepatica*. A: Mouth B: Intestines C: Ovary D: Lungs



The operation was terminated by placement of T-tube in ductus choledochus. Parasite eggs were detected in the bile samples taken from T-Tube. Pathological and parasitological analysis of the parasites showed *F. hepatica*. On the other hand, percutan transhepatic cholangiogram (PTC) and percutaneous transhepatic biliary drainage (PTBD) were applied to the last patient post-radiological analysis. When the parasitological examination of the bile was completed, since no *F. hepatica* eggs were seen we could come to a final diagnosis. Serological data were positive in every 2 cases. The first case was treated with 20 mg/kg triclabendazol given in 2 equal doses. 10 mg/kg triclabendazol was prescribed 1 month afterwards when eggs were detected in bile. The second case was treated with a single dose of 10 mg/kg triclabendazol.

The average follow-up period of cases was 2 and a half years

(1- 5 years). No recurrence was detected in the follow-ups. Other family members who lived in the same household with the patients were tested serologically; however no *F. hepatica* antibody was detected.

## DISCUSSION

*Fasciola hepatica* is a type of trematoda (schistosoma), which is rarely hosted in humans<sub>6</sub>. The source of infection is the vegetarian mammals. Infection in humans arise from ingesting water plants (eg. wild watercress) with metacercariae in mal-hygienic conditions. metacercariae which enters the body via gastrointestinal system perforates the intestines wall and moves onto the peritoneal cavity, reaching the liver parenchyme via glisson capsule. Afterwards, it enters biliary tract. In the biliary tract, the mature fluke releases eggs, which are once again excreted in feces to complete the life-cycle<sub>6</sub>.

*F. hepatica* infection has two different stages with quite different signs and symptoms. The hepatic (first, acute or invasive) stage of the illness occurs when the organism perforates the liver and begins to migrate through the liver parenchyma towards the biliary radices. The onset of this stage occurs 1–4 months following ingestion of metacercariae. The second or biliary stage usually presents with intermittent right upper quadrant pain with or without cholangitis or cholestasis<sub>3,6</sub>. Fascioliasis occurs worldwide. There are significant numbers of patients in Eastern Europe, Iran, Northern Africa and South America<sub>7</sub>. Turkey is one of the most endemic regions. The prevalence of the disease was serologically found to be 3.01% in Antalya province, and between 0.9 and 6.1% in Isparta province, in Mediterranean parts of Turkey<sub>4</sub>. Çukurova is nearby these two regions where research was held. However, no epidemiologic study has yet been done about *F. hepatica* in Çukurova up to date. Therefore, the seroprevalance of the disease is unknown. Cases are seen in forms of sporadic cases. Since this disease doesn't come to minds right away, results in delays in diagnosis and unnecessary laparotomy and invasive operational interference. In 3 of (%37.5) our 8 cases at the acute stage, laparotomy was performed on the liver mass without any serological examination for *F. hepatica* with pre diagnosis, in 2 cases mass excisions and 1 case was segmented. *F. hepatica* has been pre diagnosed in post pathological analysis and serological examinations were made. One case out of the 2, which were at the chronic stage was diagnosed pancreatic and obstructive jaundice and laparotomy was performed, parasite was present and after bile examination diagnosis was made. Since other cases

were not diagnosed, invasive peritonoscopy was performed liver biopsies and diagnosis with PTC guided PTBD treatment was successful.

Fascioliasis might result in significant complications. These are, sub capsular hematoma, hemoperitoneum, hemobilia, cholangitis, obstructive jaundice and liver fibrosis<sup>3,8</sup>. Pancreatitis formation due to obstruction in the pancreatic channel is rarely seen in the literature<sup>9</sup>. Pancreatic obstruction was seen in 1 case and obstructive jaundice complications were seen in 2 cases in our study.

Diagnosis can be made over duodenal liquid, bile and stool examinations and presence of parasite eggs<sup>1</sup>, Eosinophilia (%95), elevated Ig E and elevated ALT level are helpful in diagnosis at laboratory examinations. In histopathological examinations, Charcot Leyden crystals, eosinophilia, necrotic areas and eggs were rarely seen<sup>1,8</sup>. In all of our cases we have come across eosinophilia, elevated Ig E 6 (60%) and elevated ALT 3 (%30). F. hepatica eggs were detected in 4 cases where bile liquid examinations were performed and in two cases where stool examinations were made.

Serological methods are especially very significant in diagnosis of F. hepatica at an early stage and are more significant than stool or bile liquid examinations<sup>1,5</sup>, in our study serology resulted 100% whereas stool examinations gave only 20% positive results. The ratio of finding parasite in feces in fascioliasis cases is quite low<sup>1,8</sup>. Indirect hemagglutination (IHA), Enzyme Linked Immunosorbent Assay (ELISA) and WB analysis can be used for researching the parasite. ELISA methods would be useful especially for the laboratory diagnosis of fascioliasis, in the clinically suspected patients where the etiologic agent could not be identified. ELISA is reported to be 98% accurate<sup>1,5,8</sup>. However, it was evaluated as 100% in our studies.

Radiographic techniques have been used to aid in the diagnosis of fascioliasis. US examination is not specific in the acute (hepatic) stage while it is more helpful than CT in showing diffuse ductal dilation and/or thickening in the chronic biliary stage of the disease. CT shows hypo dense hepatic nodules in the acute (hepatic) stage simulating liver abscesses or metastases while bile duct wall thickening is the main finding in the chronic (biliary) stage of fascioliasis<sup>9</sup>. PTC and ERCP findings are bile duct dilation, tubular filling defects due to parasite itself, and jagged mucosal contour due to hyperplasia of the bile duct epithelium in chronic (biliary) stage of the disease<sup>10,11</sup>.

Human fascioliasis, however, could be just as well cured naturally by itself. However in order to avoid complications, treatment is advised in asymptomatic cases<sup>12,13</sup>. Treatment of the disease is medical. Triclabendazole, nitazoxanide, albendazole, bithionol and praziquantel have been used in the treatment of the disease<sup>12</sup>. Latest literature suggests triclabendazole due to its efficiency and minimum side effects. The disease can be cured by 10 mg/kg single dose postprandial triclabendazole successfully<sup>13</sup>. Apt et al<sup>14</sup> 79.2% in the 24 case study and El-Morshedy et al<sup>15</sup> in the 134 case study 79.4% success have been observed in order to research the efficiency of single dose triclabendazole. Single dose triclabendazole was used in treatment in all our cases. In the chronic stage case where we performed T Tube, although the patient was given two equal doses 20 mg/kg in 24 hours, eggs had to be isolated in the bile. Response was received to the same treatment administered after one month. In our other case in the chronic stage<sup>11</sup> on the other hand, bile ducts were irrigated with povidone iodine by 2.5% with the aid of PDC and thus death of the parasite and drainage of the eggs was made easier. In cases where bile channel was tried and in cases which ERCP and PTC have been performed, external catheter usage might be useful in the analysis of the performance of the drug. There is a need for such serious and more controlled research.

F. hepatica, is a parasite which infects humans rarely and should be in consideration in endemic regions and around all the time since it can cause serious complications. Operations might be necessary for such complications. In most cases however, laparotomy and invasive attempts are made for diagnostic purposes not due to complications. In cases where laparotomy was performed and even in cases where invasive attempts were made, external catheter usage which permits drainage should be considered for the death of the parasite and making drainage of the eggs easier as well as tracing the results of the treatment. The results suggest that serological methods must be used for diagnosis to avoid unnecessary invasive attempts in suspected cases, particularly in endemic areas.

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