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# A Five-Year Single-Center Experience with *Fasciola hepatica* Infection

## *Fasciola hepatica* Enfeksiyonu ile İlgili Beş Yıllık Tek Merkez Deneyimi

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### Abstract

**Introduction:** *Fasciola hepatica* infection (fascioliasis) is an uncommon zoonotic parasitic disease in humans that primarily involves the hepatobiliary system. It may present with a broad spectrum of clinical manifestations, ranging from obstructive jaundice and cholangitis to chronic biliary inflammation and cirrhosis. This study aimed to describe the clinical, laboratory, and radiological characteristics of fascioliasis cases diagnosed over a five-year period between 01.01.2020 and 01.01.2025 in a tertiary care center and to highlight its relevance in differential diagnosis.

**Materials and Methods:** We conducted a retrospective review of adult patients diagnosed with *Fasciola hepatica* infection between 2020 and 2025 at Elazığ Fethi Sekin City Hospital. Hospital records, electronic files, and discharge summaries were examined. Clinical presentations, laboratory parameters, and radiological findings at initial admission and at one-month follow-up were evaluated. Analyses were performed using SPSS version 20.0, and appropriate statistical tests were applied according to data distribution.

**Results:** Twenty-six patients met the inclusion criteria (mean age: 51 ± 10.93 years; 73% female). Most patients lived in rural areas (61.5%). Abdominal pain was reported in 50% of cases, and peripheral eosinophilia was documented in all patients. Ultrasonography, computed tomography, and magnetic resonance imaging frequently suggested malignancy (69.2%); however, these lesions regressed after treatment with triclabendazole. Significant reductions were observed in alkaline phosphatase (ALP), lactate dehydrogenase (LDH), eosinophil count, and leukocyte count, while serum albumin levels increased after treatment (p < 0.001). Stool microscopy was performed in two patients but failed to detect parasitic eggs.

**Conclusion:** Fascioliasis should be considered in the differential diagnosis of hepatic lesions, particularly in patients from rural settings who present with eosinophilia and abdominal pain. Early diagnosis can be achieved through a combination of serology, imaging modalities, and strong clinical suspicion. ALP, LDH, and eosinophil levels are valuable, non-invasive indicators for monitoring treatment response.

**Keywords:** Eosinophilia, *Fasciola hepatica*, hepatic lesions, parasitic infection, triclabendazole

### Öz

**Giriş:** Fasiyoliyazis, insanlarda nadir görülen bir paraziter enfeksiyon olup, safra yollarını etkileyebilir ve obstrüktif sarılık ile kolanjitten siroza kadar geniş bir klinik yelpazede bulgu verebilir. Bu çalışmanın amacı, üçüncü basamak bir sağlık merkezinde beş yıl içinde tanı konulan fasiyoliyazis vakalarının klinik, laboratuvar ve radyolojik bulgularını tanımlamak ve ayırıcı tanıdaki yerine dikkat çekmektir.

**Gereç ve Yöntem:** Elazığ Fethi Sekin Şehir Hastanesi'nde 2020–2025 yılları arasında *Fasciola hepatica* tanısı alan erişkin hastaların dahil edildiği retrospektif bir çalışma yürütüldü. Hastane kayıtları, dosyalar ve taburcu özetleri incelendi. Başvuru anındaki ve birinci ay takiplerindeki klinik, laboratuvar ve radyolojik bulgular SPSS versiyon 20.0 programı ile değerlendirildi. Verilerin dağılımına göre uygun istatistiksel testler uygulandı.

**Bulgular:** Çalışmaya 26 hasta dahil edildi (ortalama yaş: 51 ± 10,93 yıl; %73'ü kadın). Hastaların çoğu (%61,5) kırsal bölgelerde yaşamaktaydı. %50'sinde karın ağrısı mevcutken, tüm vakalarda eozinofili saptandı. Görüntülemelerde hastaların %69,2'sinde malignite şüphesi oluşmuş, ancak triklabendazol tedavisini takiben lezyonlarda gerileme gözlenmiştir. Tedavi sonrası alkalin fosfataz (ALP), laktat dehidrogenaz (LDH), eozinofil ve

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## Öz

lökosit düzeylerinde anlamlı azalma, albümin seviyelerinde ise artış saptandı ( $p<0,001$ ). Dışkı mikroskopisinde yumurta iki hastada araştırılmış, ancak saptanamamıştır.

**Sonuç:** Fasiyoliazis, özellikle eozinofili ve karın ağrısı olan ve kırsal kökenli hastalarda hepatik lezyonların ayırıcı tanısında dikkate alınmalıdır. Klinik şüphle birlikte serolojik testler ve görüntüleme yöntemleri erken tanıyı kolaylaştırır. ALP, LDH ve eozinofil düzeyleri tedavi yanıtının izlenmesinde faydalı, invaziv olmayan parametrelerdir.

**Anahtar Kelimeler:** Eozinofili, *Fasciola hepatica*, hepatik lezyon, paraziter enfeksiyon, triklabendazol

## Introduction

Fascioliasis is a neglected tropical disease caused by *Fasciola hepatica* and *Fasciola gigantica*, and it poses a significant global public health concern, particularly in endemic regions. Approximately 50% of infected individuals remain asymptomatic<sup>[1]</sup>. The prevalence of foodborne zoonotic trematode infections may reach up to 21% in tropical and subtropical areas, and fascioliasis disproportionately affects rural communities. An estimated 180 million people worldwide are at risk of infection. The parasite primarily invades the hepatic and biliary systems of mammals—including humans and livestock—resulting in substantial pathological damage<sup>[2]</sup>. Although ruminants such as sheep, goats, and cattle serve as the main hosts, humans become infected as accidental hosts. *Fasciola hepatica* is a leaf-shaped trematode measuring approximately 2–4 cm in length<sup>[1]</sup>.

Human infection occurs through ingestion of water or aquatic plants contaminated with metacercariae, the infective larval stage<sup>[3]</sup>. After passing through the stomach, the larvae penetrate the duodenal wall, migrate into the peritoneal cavity, and then traverse the liver capsule to reach the biliary tree<sup>[4]</sup>. Human fascioliasis progresses through two distinct clinical stages: the hepatic and biliary phases. The hepatic phase typically begins 1–3 months after ingestion of metacercariae and involves larval migration from the liver parenchyma into the bile ducts<sup>[1,4,5]</sup>. Common manifestations during this stage include abdominal pain, fever, eosinophilia, and elevated liver function test results<sup>[4,6–11]</sup>. The biliary phase commonly presents with intermittent right upper quadrant pain, with or without features of cholangitis or cholestasis<sup>[12–14]</sup>.

Extrahepatic manifestations may also occur during the acute phase, likely mediated by immunologic or allergic mechanisms. Reported findings include Löffler syndrome, right-sided pleural effusion with eosinophilia, urticaria associated with pruritus and dermatographism, and, rarely, pericarditis, cardiac conduction abnormalities, meningeal symptoms, focal neurological deficits, or seizures<sup>[12–14]</sup>.

In non-endemic settings, diagnosis is frequently delayed because of the disease's rarity and its overlapping clinical

features with other hepatobiliary conditions<sup>[1,4]</sup>. Serological testing is particularly valuable for early diagnosis because assays typically yield positive results during the early migration phase—before eggs are detectable in stool samples. These tests include indirect hemagglutination, complement fixation, counterimmunoelectrophoresis, immunofluorescence, and enzyme-linked immunosorbent assay. Although serological tests demonstrate high sensitivity, their specificity remains suboptimal. Imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) aid diagnosis in the hepatic phase, whereas ultrasonography (USG) is more informative during the biliary phase<sup>[8,9]</sup>. Nevertheless, definitive diagnosis should be supported by both serological and parasitological evidence<sup>[15]</sup>.

Triclabendazole is the treatment of choice for fascioliasis. When triclabendazole is unavailable or when patients fail to respond to therapy, alternative agents—such as nitazoxanide, albendazole, or bithionol—may be considered<sup>[2]</sup>.

Although fascioliasis is considered uncommon, it is encountered more frequently in rural regions of our country where pastoral lifestyles and livestock exposure are prevalent. In clinical practice, the disease may be radiologically misinterpreted as a hepatic tumor, metastatic lesion, or cholecystitis/cholestasis. In this study, we aimed to increase clinical awareness of fascioliasis and to highlight that patients from rural areas who present with eosinophilia and are initially evaluated for malignancy or biliary pathology may, in fact, have underlying *Fasciola* infection.

## Materials and Methods

This retrospective study included adult patients diagnosed with *Fasciola hepatica* infection between 2020 and 2025 at Elazığ Fethi Sekin City Hospital. Patient information was collected from the hospital information system, medical records, and discharge summaries.

Laboratory investigations comprised complete blood count, aspartate aminotransferase (AST), alanine aminotransferase (ALT), lactate dehydrogenase (LDH), gamma-glutamyl transferase (GGT), total and direct bilirubin, serum albumin,

coagulation parameters, and *Fasciola hepatica* indirect hemagglutination assay (IHA) tests. Stool examinations were not performed in all patients due to the limited sensitivity of egg detection in chronic infection and because some patients presented during the acute phase when eggs are not yet detectable.

Abdominal USG was performed in all patients as the primary imaging modality. Patients with suspicious lesions on USG underwent further evaluation with MRI or CT. One patient presenting with clinical features of cholestasis underwent diagnostic endoscopic retrograde cholangiopancreatography (ERCP). All patients were followed from initial presentation up to six months after treatment.

The study was approved by the Elazığ Fethi Sekin City Hospital Non-Interventional Research Ethics Committee (approval number: 268525027, dated: 06.02.2025).

### Statistical Analysis

Statistical analyses were performed using IBM SPSS statistics version 20.0 (IBM Corp., Armonk, NY, USA). Normality of variable distributions was assessed using visual inspection and analytical tests (Kolmogorov–Smirnov and Shapiro–Wilk tests). Normally distributed continuous variables were analyzed using the paired-samples t-test, whereas non-normally distributed variables were analyzed using the Wilcoxon signed-rank test. Categorical variables were evaluated using the McNemar test. Non-parametric variables are reported as median and interquartile range. A p-value < 0.05 was considered statistically significant.

## Results

In this study, 26 patients were diagnosed with *Fasciola hepatica* infection. The mean age was  $51 \pm 10.9$  years, and the female-to-male ratio was 19:7, indicating a higher prevalence among females (73%). Most patients resided in rural areas (61.5%, n=16), whereas 38.5% (n=10) were from urban regions (Table 1).

Abdominal pain was reported in 13 patients (50%), while nausea and weight loss were each observed in 4 patients (15.3%). Jaundice was present in only one patient, and another experienced intermittent diarrhea for one month. Physical examination revealed mild right upper quadrant tenderness in 12 patients (46.2%) and hepatomegaly in 3 patients (11.5%).

All patients had a positive IHA test. Radiological imaging (MRI, CT, or ultrasound) suggested a “tumor/metastasis?” in 69.2% of cases (n=18), whereas only 28.7% (n=7) were reported as “suspected *Fasciola hepatica*” (Figure 1). Lesions initially interpreted as tumors or malignancies resolved after treatment, a difference that was statistically significant (p < 0.001).

Imaging studies were normal in 8 patients. One patient was diagnosed during ERCP, where the parasite was directly visualized; this patient also tested positive by IHA and had

**Table 1. Demographic datas.**

Parameter	Value
Age (mean ± SD)	51 ± 10.94
Sex (F/M)	19 (73%)/7 (27%)
Rural/urban	16 (61.5%)/10 (38.5%)



**Figure 1.** (a) Upper abdominal CT scan of a patient with fascioliasis showing multiple hypodense nodules in the liver with a heterogeneous appearance, diffusely distributed but predominantly central. (b) Upper abdominal CT scan of a patient with fascioliasis demonstrating a heterogeneously hypodense nodule located peripherally in the liver.

been initially hospitalized with a preliminary diagnosis of cholecystitis.

Eosinophilia ( $>500/\mu\text{L}$ ) was present in all patients upon admission. Pre- and post-treatment laboratory values during the first month are presented in Table 2. Alkaline phosphatase (ALP), LDH, AST, eosinophil count, and leukocyte count significantly decreased after treatment, whereas albumin levels increased (all  $p < 0.001$ ). No significant changes were observed in ALT, total or direct bilirubin, coagulation parameters, or platelet count between admission and post-treatment assessments.

Microscopic stool examination was performed in only two patients; *Fasciola hepatica* eggs were not detected in either case.

All patients received a single oral dose of triclabendazole (10–12 mg/kg), repeated after two weeks. No adverse effects were reported. Patients in the hepatic phase did not receive antibiotics, whereas one patient in the biliary phase was treated with ceftriaxone for seven days due to an initial diagnosis of cholecystitis.

Clinical improvement, resolution of eosinophilia, and reduction in hepatic lesion size were observed in all patients at the one-month follow-up. Complete clinical and laboratory recovery was achieved in all patients by six months.

## Discussion

Fascioliasis is an infectious disease caused by the liver flukes *Fasciola hepatica* and *Fasciola gigantica*, primarily affecting ruminants such as sheep, goats, and cattle, with humans serving as incidental hosts<sup>[4]</sup>. In most human cases, the clinical course is mild. The incidence of *Fasciola hepatica* infection has increased since the 1980s, and several geographic regions have been identified as endemic for human fascioliasis<sup>[5,6]</sup>. In our country, research has predominantly focused on animals, with limited studies involving humans; consequently, the true prevalence of human fascioliasis remains unknown<sup>[16,17]</sup>. A separate study in our province reported a seroprevalence of *Fasciola hepatica* immunoglobulin G of 2.78%<sup>[18]</sup>.

Diagnosis of fascioliasis can be challenging in non-endemic areas due to its rarity and potential confusion with other hepatic or biliary diseases, often resulting in delayed identification.

**Table 2. Laboratory parameters before and after treatment.**

n = 26 patients	Pre-treatment (mean)	Post-treatment (mean)	p-value
ALP, U/L	167	110	<0.001
LDH, U/L	238	206	<0.001
Eosinophil, $10^9/\text{L}$	5896	1168	<0.001
Leukocyte, $10^9/\text{L}$	12746	8656	<0.001
Albumin, g/L	40	42	<0.001

Traditionally, diagnosis relies on detection of parasite eggs in stool samples; however, this method is unreliable because of typically low egg output<sup>[4,7]</sup>. Serological tests, which generally become positive during the early hepatic migratory phase before eggs are detectable in stool, are valuable for early diagnosis. Although these tests demonstrate good sensitivity, their specificity is limited due to potential cross-reactivity with other parasitic infections<sup>[4,7,18,19]</sup>. In our study, all patients tested positive for *Fasciola hepatica* using the IHA test, while stool examinations conducted in two patients did not detect parasite eggs.

In endemic regions, very young children and women are more frequently affected by fascioliasis. Studies from Türkiye have also reported a female predominance<sup>[20,21]</sup>, which is consistent with our findings.

Eosinophilia was present in all patients (n=26) at initial presentation. The mean eosinophil count decreased from 5,896.9/ $\mu\text{L}$  at admission to 1,168.9/ $\mu\text{L}$  post-treatment, a statistically significant reduction. These results support the use of eosinophil count as a reliable laboratory parameter for both suspecting and monitoring fascioliasis.

The mean leukocyte count at presentation was 12,746.2/ $\mu\text{L}$ , which decreased to 8,656.2/ $\mu\text{L}$  after treatment. At admission, 61.5% of patients (n=16) had leukocyte counts above 11,000/ $\mu\text{L}$  (reference range in adults according to Tietz:  $4.5\text{--}11.0 \times 10^9/\text{L}$ ), which declined to 15.4% (n=4) following treatment. This difference was statistically significant ( $p < 0.001$ ). The elevated leukocyte counts at baseline were primarily due to eosinophilia, and levels decreased in parallel with eosinophil counts after treatment.

The mean albumin level increased from 40.1 g/L at admission to 42.6 mg/dL at follow-up. Although baseline albumin levels were within the normal range in all patients, the increase was statistically significant ( $p < 0.001$ ), suggesting that fascioliasis may transiently impair hepatic albumin synthesis due to hepatocellular involvement.

In fascioliasis, elevated ALP is thought to reflect hepatocellular and biliary injury<sup>[19,22]</sup>. In our study, the mean ALP level at presentation was 167.96 mg/dL (range: 69–296), which decreased to 110.6 mg/dL (range: 50–206) post-treatment. This reduction was statistically significant ( $p < 0.001$ ), supporting the use of ALP as a marker for evaluating treatment response.

Elevated LDH in fascioliasis likely reflects hepatocellular damage. The mean LDH level at presentation was 238.85 mg/dL (range: 16–383), decreasing to 206.96 mg/dL (range: 144–291) after treatment, with a statistically significant difference ( $p < 0.001$ ). No significant changes were observed in GGT, bilirubin, or coagulation parameters before and after treatment.

Triclabendazole, an imidazole derivative, is effective against all developmental stages of *Fasciola* spp. It is typically administered as a single dose of 10 mg/kg, repeated after 2–4 weeks; in severe cases, a dose of 20 mg/kg may be used. Treatment efficacy exceeds 90% in most cases<sup>[17]</sup>. Response is monitored by reductions in eosinophil counts, disappearance of eggs in stool, decreased antibody titers, and regression in radiological findings<sup>[23–25]</sup>. Stool examinations were not performed in all patients due to the low sensitivity of egg detection in chronic fascioliasis.

Conventional imaging modalities such as MRI and CT are commonly used for diagnosis<sup>[20]</sup>. ERCP has recently gained prominence, particularly in diagnosing biliary-phase fascioliasis. In our country, Tuna et al.<sup>[24]</sup> reported a 44-year-old patient diagnosed via ERCP who presented with abdominal pain, nausea, and vomiting. In our cohort, 18 patients had liver lesions suspicious for tumors or metastases on abdominal CT or MRI. One patient was diagnosed via ERCP, highlighting the utility of this technique in selected cases. In contrast, only seven patients had imaging findings suggestive of *Fasciola hepatica*. These observations emphasize that fascioliasis should be included in the differential diagnosis of hepatic masses or suspected metastases, particularly in patients presenting with abdominal pain and eosinophilia.

## Conclusion

Fascioliasis is an underdiagnosed yet treatable parasitic infection. In regions with rural populations, it should be considered in patients presenting with eosinophilia, hepatic lesions, or abdominal pain. Non-invasive biomarkers, including ALP, LDH, and eosinophil counts, are useful for monitoring treatment response. Our findings contribute to the growing body of literature on fascioliasis and underscore the value of serological and imaging tools for early diagnosis.

## Ethics

**Ethics Committee Approval:** The study was approved by the Elazığ Fethi Sekin City Hospital Non-Interventional Research Ethics Committee (approval number: 268525027, dated: 06.02.2025).

**Informed Consent:** Retrospective study.

## Footnotes

### Authorship Contributions

Surgical and Medical Practices: Ö.G., Z.Ç., Concept: Ö.G., Y.K., Design: Ö.G., Y.K., Data Collection or Processing: Ö.G., Y.K., Z.Ç., Analysis or Interpretation: Ö.G., Y.K., Literature Search: Ö.G., Z.Ç., Writing: Ö.G., Y.K., Z.Ç.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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