

# Subcapsular Liver Hematoma: One of the Many Faces of Acute Fascioliasis

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Subcapsular liver hematoma is an uncommon and underdiagnosed manifestation of fascioliasis. We report 6 cases and review 21 previous reports. The mean age was 51 years; 12 cases were from Peru; and 18 were women. Only 6 patients required surgical drainage. Medical management is the mainstay treatment.

**Keywords.** fascioliasis; subcapsular liver hematoma; zoonosis.

Fascioliasis is a food-borne zoonotic disease mainly caused by the liver trematode *Fasciola hepatica* [1]. The disease is endemic in the Americas, the Caribbean, Africa, Asia, Western Europe, and the Middle East. *Fasciola* is transmitted by ingesting raw vegetables or drinking contaminated water [1, 2]. After an incubation period of 1 to 3 months, patients may develop symptoms attributed to parasite migration through the peritoneum, followed by penetration of the liver capsule [1, 3]. Then, parasites reach the biliary tract, where they become sexually mature and can establish a chronic infection for years. In this phase, *Fasciola* eggs are shed into the environment.

Subcapsular liver hematoma is a rare complication of the fascioliasis migratory phase, resulting from blood vessel damage. Few reports have described its presentation and outcomes [4–16]. Common to some of these case reports is overlooking the fascioliasis diagnosis, often leading to unnecessary surgical interventions [4, 5, 7, 8]. We report 6 cases of subcapsular liver

hematomas associated with fascioliasis in Peru and review 21 previous reports proposing a diagnostic and therapeutic approach.

## CASE REPORT

### Case 1

A 52-year-old woman from the highlands was admitted with 3 months of right upper quadrant abdominal pain and fever. The physical examination revealed hepatomegaly. Hemoglobin was 13.7 g/dL, leukocytes 18 600 cells/mm<sup>3</sup>, and eosinophils 11 532 cells/mm<sup>3</sup>, and liver transaminases and alkaline phosphatase were 2 to 3 times the upper limits of normal levels. A contrasted abdominal computed tomography (CT) scan showed 2 interconnected hypodense lesions (13 × 3.5 cm and 8.5 × 5.3 cm) without enhancement over hepatic segments VI, VII, and VIII, with a volume of about 373 mL (Figure 1A). The Fas2 enzyme-linked immunosorbent assay (ELISA) result for *Fasciola* antibodies was positive, and *F. hepatica* eggs were identified in a stool sample. The patient received a 2-day course of triclabendazole (10 mg/kg/d). A follow-up CT scan 2 months later showed a marked reduction in the collections (Figure 1B). Results from the stool follow-up examination at 3 months were negative.

### Case 2

A 38-year-old woman was transferred for acute moderate anemia that required a blood transfusion at another center. She had been admitted with 6 weeks of right upper quadrant pain and fever. The physical examination revealed hepatomegaly. Hemoglobin was 12.3 g/dL and eosinophils 736 cells/mm<sup>3</sup>, and alkaline phosphatase was at 2 times the upper limits of normal values. An abdominal CT scan showed a single hypodense lesion (16 × 7.2 cm) with no contrast enhancement over segments VI, VII, and VIII, with a volume of about 970 mL (Figure 1C). Results from Fas2 ELISA and stool microscopy for *Fasciola* eggs were positive. The patient received triclabendazole (10 mg/kg/d) for 2 days. A CT scan 11 months later revealed a marked reduction in the subcapsular liver hematoma (Figure 1D). Findings from stool follow-up examination at 3 months were negative.

### Case 3

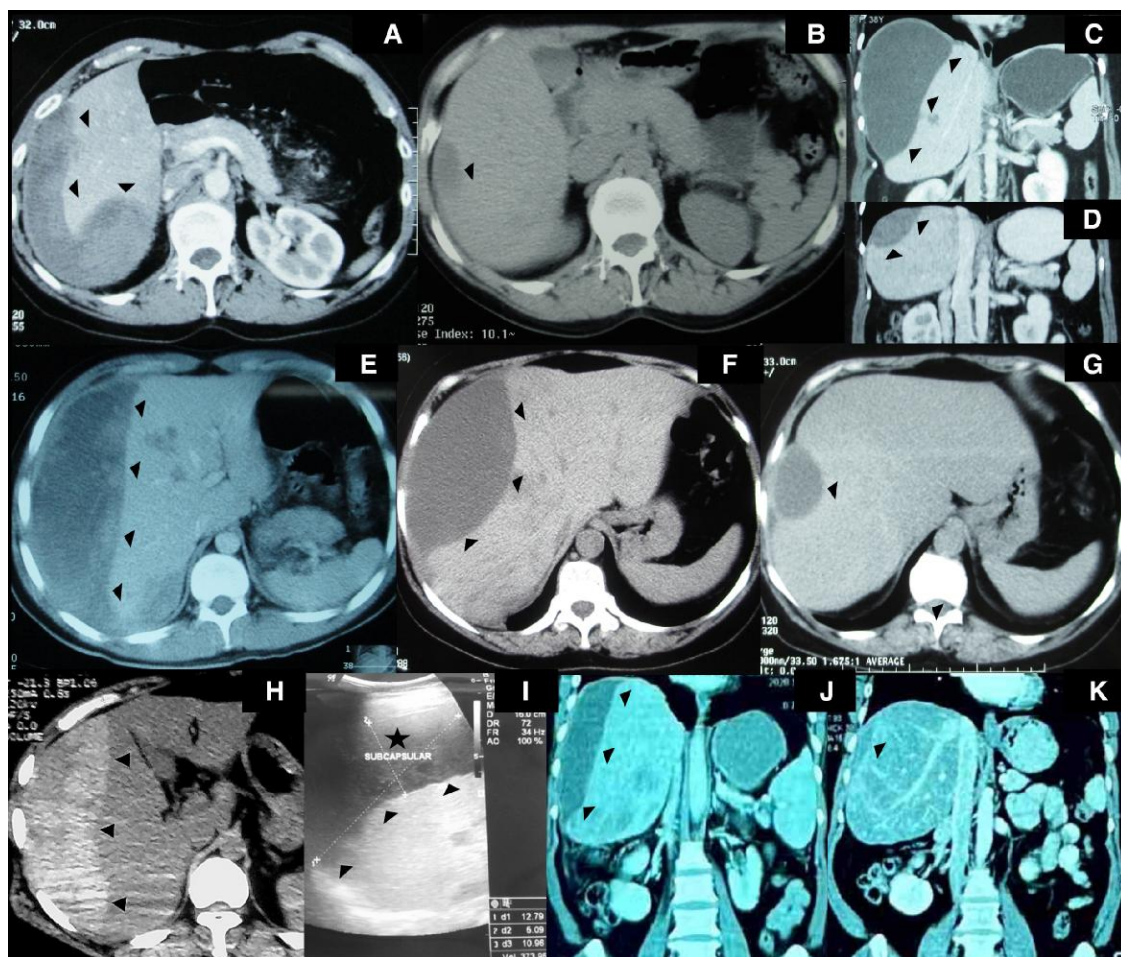
A 22-year-old man was admitted with 6 weeks of generalized pruritus and right upper quadrant pain for 3 weeks. The physical examination revealed scratch lesions and tenderness on palpation of the right upper quadrant. Hemoglobin was 14.7 g/dL, leukocytes 10 000 cells/mm<sup>3</sup>, and eosinophils 900 cells/mm<sup>3</sup>, and liver enzymes were normal. An abdominal CT scan revealed multiple 2-cm round hypodense lesions with

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**Figure 1.** A, Hypodense heterogeneous hepatic subcapsular collection is adjacent to hepatic segments VI, VII, and VIII (black arrows). B, Reduction of hypodense subcapsular collection limited to hepatic segment VII (black arrows). C, Hypodense homogeneous hepatic subcapsular collection is adjacent to hepatic segments VII and VIII (black arrows). D, Reduction of the hypodense subcapsular collection limited to hepatic segment VIII (black arrows). E, Hypodense heterogeneous hepatic subcapsular collection is adjacent to hepatic segments VI, VII, and VIII (black arrows). F, Hypodense homogeneous hepatic subcapsular collections are adjacent to segments VII and VIII (black arrows). G, Reduction of hypodense subcapsular collection limited to hepatic segment VII (black arrows). H, Hypodense homogeneous hepatic subcapsular collection is adjacent to hepatic segments VI, VII, and VIII (black arrows). I, Hypoechogenic heterogeneous hepatic right subcapsular collection (black arrows and star). J, Hypodense homogeneous hepatic subcapsular collection is adjacent to hepatic segments VI, VII, and VIII (black arrows). K, Reduction of hypodense subcapsular collection limited to hepatic segment VII (black arrows).

peripheral enhancement throughout the liver parenchyma and a hypodense lesion ( $18.4 \times 6.4$  cm) over segments VI, VII, and VIII without enhancement, with a volume of about 1047 mL (Figure 1E). Results from the arc2 immunoelectrophoretic test and stool microscopy for *F. hepatica* eggs were positive. The patient was treated with 2 days of triclabendazole (10 mg/kg/d) with resolution of symptoms. The stool follow-up examination at 3 months yielded negative findings.

#### Case 4

A 56-year-old woman was admitted with 4 weeks of right upper quadrant pain. Findings from the physical examination were unremarkable. Hemoglobin was 11.0 g/dL, leukocytes  $11\,500$  cells/mm<sup>3</sup>, and eosinophils  $2564$  cells/mm<sup>3</sup>, and liver transaminases and alkaline phosphatase were 4 and 2 times

the upper limits of normal levels, respectively. An abdominal CT scan revealed 2 connected hypodense lesions ( $14 \times 7$  cm and  $6.5 \times 4$  cm) without enhancement over segments VI, VII, and VIII, with a volume of about 900 mL (Figure 1F). The *Fasciola* Arc2 immune electrophoresis test result was positive, but findings from repeated stool examinations were negative for *F. hepatica* eggs. The patient received a 2-day course of triclabendazole (10 mg/kg/d). The eosinophil count returned to normal after 8 weeks. One year later, a CT scan of the abdomen revealed a reduced hematoma (Figure 1G).

#### Case 5

A 45-year-old woman was admitted with 2 months of right upper quadrant pain, nausea, and emesis. The physical examination revealed tender hepatomegaly. Hemoglobin was 11 g/dL,

leukocytes 8730 cells/mm<sup>3</sup>, and eosinophils 1049 cells/mm<sup>3</sup>, and the transaminases and alkaline phosphatase were normal. Abdominal CT scan showed a hypodense lesion without contrast enhancement, with a volume of about 500 mL (Figure 1H). The Fas2 ELISA result for *Fasciola* antibodies was positive, but multiple stool microscopy test results were negative. The patient received a single triclabendazole dose (10 mg/kg). Within 6 months after treatment, her symptoms and eosinophilia improved; also, an abdominal ultrasound detected a diminished hematoma (Figure 1I). However, the stool microscopy results remained positive for 12 months, and she received repeated courses of triclabendazole. Three months after the last course, the stool examination finding was negative.

### Case 6

A 60-year-old woman was admitted 4 years ago with 6 months of right upper quadrant pain and severe anemia (hemoglobin, 7 g/dL). A contrast abdominal CT scan showed a hypodense lesion (14 × 4 cm) without enhancement over hepatic segments VI, VII, and VIII, with a volume of about 293 mL (Figure 1J). The patient was treated with 2 doses of triclabendazole (10 mg/kg) with clinical and radiologic improvement (Figure 1K). Four years later, she was readmitted with a 6-month history of right upper quadrant pain and nausea. Two weeks before admission, she received 2 doses of triclabendazole (10 mg/kg) in the outpatient clinic for chronic *F hepatica* infection. An abdominal ultrasound revealed hepatomegaly with gallstones and dilated intra- and extrahepatic bile ducts. The patient improved with only conservative management. Results from the stool follow-up examination at 3 months were negative.

## DISCUSSION

The incidence of a subcapsular liver hematoma in patients with fascioliasis is unknown. Some case series suggest that it is uncommon [2, 17, 18]. Ibrahim et al reported on a case series of 260 patients in Egypt; none presented with it [18]. Furthermore, none of 87 patients who underwent extensive radiologic testing in Turkey presented with it [19]. In 2 series from Peru, Torres et al (1970–2002) and Wong et al (2003–2010) reported a total of 345 patients admitted for fascioliasis; only 2 (0.57%) were diagnosed with it [2, 17]. One patient underwent exploratory laparoscopy, drainage of the hematoma, and liver biopsy [2].

Subcapsular liver hematoma due to fascioliasis is likely underreported. The cause of it may be hard to overlook if related to iatrogenic causes or underlying illnesses. However, “spontaneous” liver hematomas in patients with no significant medical history may not raise the possibility of fascioliasis even in

endemic countries. The unspecific symptoms of fascioliasis may cause delayed diagnosis and unnecessary invasive procedures [2]. Early diagnosis and conservative medical treatment lead to the resolution of symptoms [20]. It is unknown if patients infected with *Fasciola* with minor subcapsular liver hematoma remain undiagnosed.

Table 1 summarizes clinical information from 27 patients with subcapsular liver hematoma associated with fascioliasis [4–16]. Most patients (18/27) were from Latin America, and almost half (12/27) were from Peru. Peruvian patients came from the highlands of the country. Middle-aged women (18/26) accounted for most cases. It is unclear why women presented it more often; studies suggest that *Fasciola* infection occurs in this group more commonly [21]. The mean age of patients was 51 years (SD, 16.7); the median duration of symptoms was 25.5 days (IQR, 10–60); and the median hemoglobin level on admission was 10.1 g/dL (IQR, 8.65–12.75). In cases where an eosinophil count was reported, all patients except 1 had eosinophilia, and most (18/21) had hypereosinophilia. Measurements of the subcapsular liver hematoma diameters were available for 18 patients: the median maximum and minimum diameters were 14 cm (IQR, 8.75–16.45) and 5.3 cm (IQR, 4–7.2). The approximate volumes were available for 11 patients, and the median estimated volume was 901 mL (IQR, 373–1047). Four patients had more than 1 hematoma. Despite the large size of 11 hematomas (greater or equal to the median maximum diameter), all patients presented with hemoglobin levels around 10.1 mg/dL, and 3 received blood transfusions [5, 15]. Of 27 patients, 6 (22%) had a surgical procedure: 4 due to hematoma rupture and 2 due to surgeon’s decision. No mortality and no cases of hepatic compartment syndrome were reported. These findings support conservative management with triclabendazole as standard treatment [22, 23]; surgical interventions may be needed in patients who have hemodynamic instability or develop an acute abdomen [4, 5, 7, 8].

Subcapsular hematoma must be suspected in patients with fascioliasis who live in endemic areas, present with right upper quadrant pain, and have abdominal ultrasound and CT scans showing a hypodense liver collection that does not modify the surface of the liver [19, 24]. A nonenhancing subcapsular collection on a contrast CT scan is highly suspicious for fascioliasis, mainly if associated with eosinophilia, and should prompt the investigation and treatment for this diagnosis.

This study highlights the rarity of subcapsular liver hematoma caused by *F hepatica*, underscoring the importance of including this complication in the differential diagnosis of subcapsular collections, particularly in endemic regions. The findings emphasize the significance of medical management as the primary therapeutic strategy in addressing such cases.



**Table 1. Clinical Characteristics and Outcomes Among 27 Patients With Subcapsular Liver Hematomas Associated With Fascioliasis**

Age, y; Sex	Country	Symptom Duration	Clinical Manifestations; Hb, g/dL; AEC (cells/mm <sup>3</sup> )	Characteristics of the Subcapsular Liver Hematoma	Intervention	Outcome	Reference
52; F	Peru	3 mo	RUQ pain, fever; 13.7; 11 532	Two hypodense lesions with no enhancement measuring 13 x 3.5 cm and 8.5 x 5.3 cm in segments VI, VII, and VIII with a volume of 373 mL	Medical <sup>a</sup>	Recovered	This report
38; F	Peru	2 mo	RUQ pain, fever; 12.3; 736	One hypodense lesion with no enhancement measuring 16 x 7.2 cm in segments VI, VII, and VIII with a volume of 970 mL	Medical	Recovered	This report
22; M	Peru	3 wk	RUQ pain; 14.7; 900	One hypodense lesion with no enhancement measuring 18.4 x 6.4 cm in segments VI, VII, and VIII with a volume of 1047 mL	Medical	Recovered	This report
56; F	Peru	1 mo	RUQ pain; 11; 2564	Two hypodense lesions with no enhancement measuring 14 x 7 cm and 6.5 x 4 cm in segments VI, VII, and VIII with a volume of 901 mL	Medical	Recovered	This report
45; F	Peru	2 mo	RUQ pain; 11; 1049	One large hypodense lesion measuring 15 x 15 cm with a volume of 500 mL	Medical	Recovered	This report
60; F	Peru	6 mo	RUQ pain; 7; NA	One hypodense lesion with no enhancement of 14 x 4 cm with a volume of 292 mL	Medical	Recovered	This report
32; M	Cuba	1 mo	RUQ pain, shock; 8.8; 7215	No computed tomography scan performed. Approximately 2500 mL of blood drained during laparotomy	Surgical <sup>b</sup>	Recovered	[4]
54; F	Cuba	3 mo	RUQ pain, fever, weight loss; 14; 7072	One hypodense lesion measuring 7.3 x 3.9 cm in the right liver lobe. A subcapsular hematoma was found, and a granuloma was biopsied	Surgical <sup>b</sup>	Recovered	[4]
49; M	Cuba	NA	RUQ pain, fever; 13.2; 3564	One hypodense lesion measuring 9.1 x 5.3 cm in the right lobe	Medical	Recovered	[4]
54; F	Cuba	NA	Abdominal pain, jaundice, weight loss; 10.2; 5705	One hypodense lesion measuring 7.3 x 3.9 cm in segments VII and VIII. Granulomas were observed and 1 was bleeding	Surgical <sup>c</sup>	Recovered	[5]
64; F	Cuba	6 mo	Abdominal pain, pallor, jaundice, weight loss; 8.8; 8695	One hypodense lesion in the right lobe. Approximately 2000 mL of blood was drained, and the right lobe was hepatectomized	Surgical <sup>b</sup>	Recovered	[5]
47; F	Spain	NA	Abdominal pain; NA; NA	One hypodense lesion in the right lobe	NA	Recovered	[6]
22; F	Peru	1 mo	RUQ pain, nausea, vomiting; 10.1; 4459	One hypodense lesion measuring 14 x 8 cm in segments V, VI, VII, and VIII. Approximately 800 mL of blood was drained	Surgical <sup>c</sup>	Recovered	[7]
60; F	Chile	3 d	RUQ pain, fever, peritoneal signs; 8.4; 10 024	One hypodense lesion in segments VI and VII. Approximately 250 mL of blood was drained	Surgical <sup>b</sup>	Recovered	[8]
40; M	Peru	15 d	RUQ pain; 9.06; 2460	On hypodense lesion measuring 19.9 x 8 cm in segments VI and VII	Medical	Recovered	[9]
59; M	Peru	7 d	RUQ pain, fever; 15.9; 7791	One hypodense lesion measuring 16.6 x 4.2 cm in segments VI and VII	Medical	Recovered	[9]
76; F	Peru	15 d	RUQ pain, jaundice, fever; 10.3; 0	Two hypodense lesions measuring 13.3 x 7.1 cm and 8.1 x 5.1 cm in segments VI and VII	Medical	Recovered	[9]
47; F	Peru	10 d	RUQ pain; 9.9; 1686	Two hypodense lesions that together measured 16.3 x 7.8 cm in segments VI, VII, and VIII with a volume of 1018 mL	Medical	Recovered	[9]
NA	Turkey	NA	NA	Subcapsular hematoma in segment VI	Medical	Recovered	[10]
70; M	USA	30 d	Fatigue, weight loss, anorexia; NA; NA	Large subcapsular liver hematoma	Medical	Recovered	[11]
70; M	USA	21 d	RUQ pain, fever; NA; 2600	Right giant mixed-density subcapsular liver hematoma measuring 18 x 5.5 cm	Medical	Recovered	[12]
23; F	Afghanistan	2 mo	Cough, shortness of breath, wheezing; NA; 9900	Right large subcapsular liver hematoma	Medical	Recovered	[13]
52; F	Korea	2 d	Abdominal pain; 7.5; 1950	Right subcapsular liver hematoma with active bleeding	Embolization	Recovered	[14]
68; F	Turkey	Sudden onset	RUQ pain, shock, hepatomegaly; 7.5; NA	One hypodense lesion with no enhancement in the right liver lobe measuring 15 x 5 cm	Medical	Recovered	[15]

Table 1. Continued

Age, y; Sex	Country	Symptom Duration	Clinical Manifestations; Hb, g/dL; AEC (cells/mm <sup>3</sup> )	Characteristics of the Subcapsular Liver Hematoma	Intervention	Outcome	Reference
84; F	Turkey	Sudden onset	RUQ pain, hepatomegaly, recurrent urticarial eruption; 8.5; 8026	One hypodense lesion with no enhancement in the right liver lobe measuring 9 cm of maximum diameter	Medical	Recovered	[15]
22; M	Turkey	15 d	RUQ pain, recurrent urticarial eruption; NA; 4448	One small hypodense lesion with no enhancement in the right liver lobe	Medical	Recovered	[15]
61; F	Peru	NA	RUQ pain that radiates to the back; NA; 6732	One hypodense lesion with no enhancement in segments V and VI. Placement of a percutaneous catheter	Percutaneous drainage	Recovered	[16]

Abbreviations: AEC, absolute eosinophil count; F, female; Hb, hemoglobin; M, male; NA, not available; RUQ, right upper quadrant.

<sup>a</sup>Medical: triclabendazole at 10 mg/kg/dose for 1 or 2 doses.

<sup>b</sup>Acute abdomen.

<sup>c</sup>Surgeon's decision.

## Notes

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**Ethical approval.** This study is a case series and was exempted from institutional review board approval. All patients consented to provide information about their illnesses.

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**Potential conflicts of interest.** All authors: No reported conflicts.

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