

## Inferior Vena Cava Compression by an Hydatid Cyst

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### Abstract

Human hydatid disease is a parasitic disease caused by the development in humans of the larval form of the dog tapeworm (*Echinococcus granulosus*). It is located more frequently in the liver (50 - 70% of cases) and in the lung (20 - 30%). The hydatid cyst of the liver is a benign tumor whose complications depend on its evolution: it can grow and compress the liver parenchyma, the bile duct or the large vascular axes, originating a compression syndrome of the lower vena cava, portal hypertension, Budd-Chiari syndrome by compression of the suprahepatic veins, compression of the hepatic hilum with jaundice due to biliary obstruction, cholangitis crisis.

We present the case of a 77-year-old patient with hypertension, rheumatoid arthritis and renal failure, diagnosed with hydatid cyst of possible hepatic location through radiological findings in the context of bowel obstruction due to an internal hernia. After developing an abdominal herniation four months after surgery, a substantial growth of the cyst was observed with a symptomatology similar to a lower vena cava syndrome.

**Keywords:** *Inferior Vena Cava; Hydatid Cyst; Echinococcus granulosus*

### Introduction

Hydatidosis is a parasitic zoonosis caused by the ingestion of dog tapeworm eggs (*Echinococcus granulosus*). The human being is an accidental intermediate host; the dog is the definitive host in whose intestine the tapeworm lodges. The eggs eliminated in the dog's faeces are ingested by herbivores that constitute the natural intermediate host. By ingesting raw vegetables or touching the contaminated dog's fur, a human being can become infected; the eggs penetrate the intestinal wall and reach the liver through the portal circulation.

Hydatidosis is located mainly in the liver (50 - 70% of cases) and secondly in the lung (20 - 30%). Other locations are less frequent.

The hydatid cyst of the liver is a benign tumour that produces complications, in 40% of the cases, infectious or biliary, and is responsible for long hospitalizations associated with high costs. The disease has a variable evolution, as the cyst can increase in volume, compressing the hepatic parenchyma, the main bile duct or the large vessels, and causing different manifestations depending on location. Management depends mainly on access, size and patient conditions, with surgery being the standard treatment.

### Clinical Case

A 77-year-old woman diagnosed with hydatid cyst through imaging tests after intestinal occlusion was surgically treated. At that time, the cyst had a 4 mm diameter. After developing an abdominal herniation four months after surgery, a substantial growth was observed (9.5 x 7 cm), with a symptomatology similar to a lower vena cava syndrome. The patient was programmed for cystperytectomy.

In the pre-anesthetic assessment, a history of arterial hypertension, rheumatoid arthritis, gout, polymyalgia rheumatica and renal insufficiency due to compression of the inferior vena cava (IVC) were highlighted. Blood tests found high levels of creatinine and blood nitrogen, with no other finding. No pulmonary symptoms were reported; only tachycardia (possibly related to IVC compression and preload decrease) was highlighted. The CT scan showed a large calcified cystic lesion measuring 9.5 x 7 cm on its anteroposterior and transverse axis, respectively, in the liver segment VI, with no other findings.

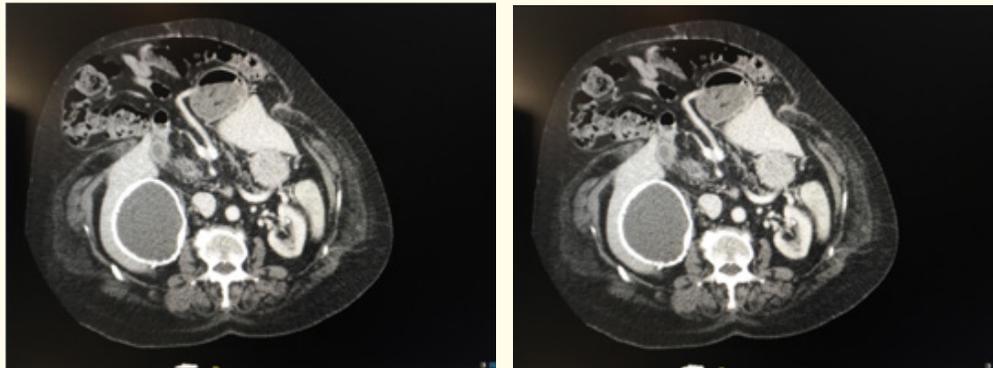


Figure 1

A scheduled intervention was performed under inhalation anesthesia with sevoflurane (chosen for its low impact on the hepatic blood flow) combined with epidural anesthesia through T12-L1 catheter. Antibiotic prophylaxis with cefazolin 2g and anaphylactic prophylaxis with anti-H2 (ranitidine 50 mg) and anti-H1 (dexchlorpheniramine 5 mg) was administered. The left radial artery and the right VVI were cannulated. Right subcostal laparotomy was performed to access the cyst. The surgery did not present complications.

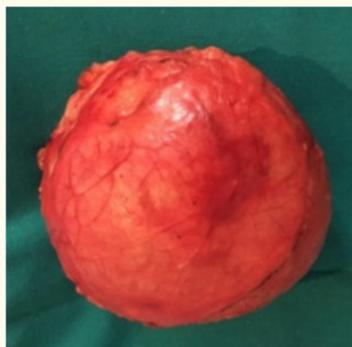


Figure 2

Cholangiography was performed without evidence of membranes inside the bile duct and without communication with the cyst. Surprisingly, the hepatic cyst was found in contact with the lower border of segment VI of the liver but without apparent direct anatomic relation to it. The retroperitoneum was opened and the IVC branch reaching the cyst was clamped without significant bleeding. Emergence and extubation occurred without incidence and the patient was transferred to the critical care unit for postoperative control.



Figure 3

**Discussion**

Hydatidosis occurs in most cases in the liver and lung, in a 2/1 to 3/1 ratio in patients with clinical symptoms. The studies in autopsies show a relationship between these locations of 4/1, which shows the importance of the liver filter as a determining factor for the location of the cyst and expresses that a significant percentage of the hepatic cysts do not cause symptoms, maintaining a balanced agent/guest state throughout life. The most frequent symptoms include pain, palpable mass, jaundice and fever; in the lungs, cough and hemoptysis. Leakage or over infection may also appear.

Diagnosis is based on epidemiology, physical examination, diagnostic imaging and/or serological tests. In hepatic hydatidosis, the gold standard is ultrasound imaging, because of greater sensitivity and specificity.

In all cases, treatment must be individualized. Two scenarios may arise:

1. In symptomatic patients or complicated hydatid cysts, treatment of choice is surgery.
2. In asymptomatic hydatid cysts hosts, management is decided according to type and size of cyst.

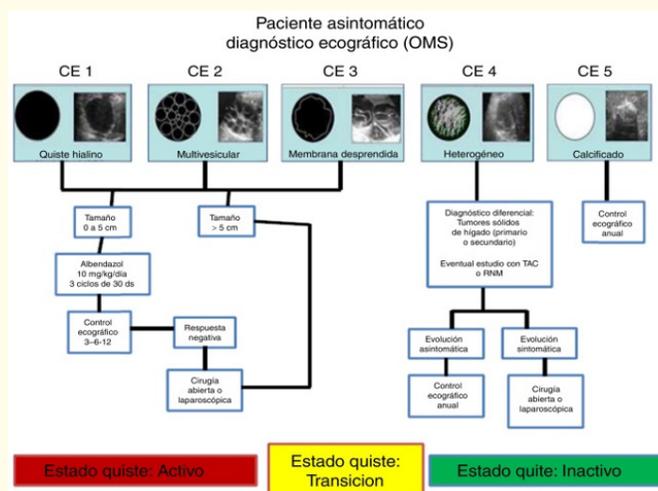


Figure 4

In our case, the diagnosis was an unexpected finding in an asymptomatic patient at that time. However, a few months later the cyst growth and the appearance of symptoms warranted surgical treatment.

With a possible cyst over infection in mind, and the consequent risk of sepsis should a leakage occur, antibiotic prophylaxis for Gram-negative bacteria and anaerobes (main responsibility in hepatobiliary infections) should be performed. The risk of bleeding should also be assessed, according to the cyst location and its anatomical relation to large vessels. In our case, there was contact between the cyst and a vein dependent on the IVC, which was clamped uneventfully.

There is controversy regarding the prevention of exceptional anaphylactic episodes due to passage of hydatid fluid to the systemic circulation, by manipulation during the surgical act itself or by overdistention after intracystic injection of sterilization fluid. In our case, prophylaxis was administered, although there was no presumed contact between the hydatid fluid and the blood. Even so, there are doubts about the effectiveness of this prophylaxis should an anaphylactic shock occur. Likewise, the use of preoperative antiparasitic drugs is under discussion, because they do not reach adequate concentrations in the cystic fluid. Our patient was not treated with antiparasitic drugs preoperatively.

During surgery, it was observed that the cyst did not depend directly on the liver but was located retroperitoneally, although in contact with liver tissue. This infrequent finding may increase the risk of recurrence, as the mechanisms of larval implantation in the retroperitoneum are not clearly known, which conditions a stricter postsurgical control [1-3].

### Conclusion

The hydatid cyst is a public health problem in the countries of the Mediterranean coast. Surgical treatment is the gold standard, although minimally invasive percutaneous, endoscopic or laparoscopic therapeutic methods are increasingly used as initial treatment of the cyst. It is important to note the usefulness of a rigorous preoperative evaluation of the hydatid cyst, in particular the determination of the size, the anatomical relations and the identification of direct or indirect signs of a quistobiliary communication. In the perioperative period, main complications are anaphylactic and hemorrhagic, so it is recommended to stay in a postoperative critical care unit for 24 hours after the intervention.

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