

# Hydatid cyst management and follow-up in cancer patient

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## Abstract

Hydatid disease is a rare tapeworm infection that can cause the formation of cysts in the liver and other organs. Although it is uncommon for patients to have both hydatid cysts and cancer at the same time, it is possible, and this can easily be confused with metastasis. Proper management of hydatid cysts in a patient with cancer requires the consensus of oncologists, hematologists, and infectious disease specialists. According to a literature review and investigation of case reports, the treatment approach depends on the stage of the cyst, and chemotherapy management remains unchanged. It is crucial to follow specific treatment guidelines for each stage of the cyst to ensure proper treatment.

## Introduction

Hydatid disease, also known as cystic echinococcosis, is a parasitic infection caused by a tapeworm. It can cause cysts to grow in the liver and other organs. This infection is common in rural and underdeveloped areas where people raise livestock. Tapeworms usually live-in hosts like sheep and dogs. However, humans can get the disease if they accidentally consume anything infected with the parasite egg. Humans become intermediate hosts, but Hydatid disease is not contagious, which means it doesn't spread through person-to-person contact. This zoonotic disease presents as hydatid cysts, with canines as definitive hosts and sheep as intermediate hosts. Hydatid disease can be contracted by humans accidentally through various means such as consuming contaminated water, eating vegetables with infected soil, or having contact with an infected dog. The disease can remain asymptomatic for many years. Cystic echinococcosis can affect any visceral organ in the body, including the lungs, brain, and kidneys. However, the liver is the most affected organ due to the bowel venous drainage system<sup>1-6</sup>

Recent studies in Europe and Central Asia suggest a link between hydatids and tumors. Certain parasite antigens may inhibit tumor growth, indicating a protective effect against cancer by echinococcus. However, the simultaneous occurrence of cancer and hydatid cysts is rare and complex, presenting a challenge for oncologists and infectious disease specialists<sup>7</sup>. At first glance, it may be mistaken for metastasis, but subsequent imaging and serology results confirm the diagnosis of hydatid cysts and raise concerns about initiating chemotherapy. Due to the rarity of such cases, there are no established guidelines for managing them. This literature review explores cases where individuals have experienced both cancer and hydatid cysts, examining their clinical manifestations, management strategies, prognosis, and post-treatment monitoring<sup>4,6</sup>.

## Clinical presentation

Patients with concurrent cancer and hydatid cysts may exhibit overlapping symptoms depending on the type of cancer, or the symptoms may be entirely distinct from the location of the hydatid cyst. In any scenario, individuals with a hydatid cyst may display symptoms related to the condition or remain asymptomatic.

Common clinical manifestations include abdominal pain, masses, and signs of infection for hydatid cysts, while cancer-related symptoms vary based on the tumor type and location. Approximately 10% of hydatid cysts cause signs and symptoms, contingent upon their size and location. In 90% of cases, the parasitic infection is found in the liver parenchyma, followed by the lung parenchyma, with less common sites such as the spleen, kidneys, and brain <sup>8,9</sup>. Consequently, when a patient has both cancer and a hydatid cyst, the clinical symptoms of these two conditions might not necessarily align, depending on the type of cancer and its location. However, in some patients with advanced cancer, hydatid cyst symptoms might raise suspicion of cancer progression and metastatic conditions <sup>9</sup>. It is occasionally diagnosed as a hydatid cyst using imaging and serological tests, but the differentiation between cancer progression and a hydatid cyst is sometimes only revealed during surgery in such cases<sup>10</sup>.

## Diagnosis

In clinical presentation, an asymptomatic individual with a cystic mass in different organs associated with the epidemiological aspect of the disease is considered a suspected case. While serology (Western blot and ELISA) has high diagnostic sensitivity and specificity, false negative results may occur in liver or lung cysts in patients with no release of immunogens into the bloodstream or the presence of antigen-antibody complexes. Radiologists play an essential role in detecting these cysts. The Pan American Health Organization (PAHO) and the WHO support Ghabis and WHO classifications for diagnostic imaging, encompassing various types of hydatid cysts based on imaging characteristics (Table 2) (Figure 1&2). These classifications, along with radiological findings, aid in proper characterization and clinical staging, despite the potential for false negative serology results in some cases<sup>11</sup>. When calcifications occur, they are located in the cyst wall, appearing in curved or ring shapes in the peri cystic layer. They can be seen in 20-30% of cases. Complete calcification of the hydatid cyst is crucial because it indicates the death of the parasite, rendering the cyst clinically inactive <sup>12-16</sup>.

## Management

There are no established guidelines for managing a cyst during chemotherapy for patients who have both cancer and a cyst. This is a rare scenario. However, a comprehensive table has been created to describe the treatment and follow-up of such patients. The Table 1 includes the patient's clinical symptoms, hydatid cyst stage, and treatment approaches based on literature review and our patients treated who had cancer and cyst at the same time <sup>6,10-12</sup>.

The our patients with hydatid cysts that has been diagnosed with hydatid cyst based on serology testing or imaging ,including one men with gastrointestinal cancer and three women with breast cancer were observed .The average age of these patients was 50 years ,in one case of gastric cancer ,the patient had a calcified liver cyst ,and chemotherapy was initiated without treating the hydatid cyst due to complete calcification, resulting in a complication- free two-year follow-up .In the remaining three cases, the hydatid cysts were in transitional stage ,and oral albendazole treatment was administered alongside chemotherapy ,with no hydatid cyst-related problems during one-year and two-year follow-ups (Table 1).

Based on literature review and our experiences, in the case of a patient having both cancer and a hydatid cyst, the management of the hydatid cyst primarily depends on the stage of the cyst. The type of chemotherapy or its management strategy does not require any changes. The treatment criteria specific to each stage of the hydatid cyst are followed to manage it.

In general, there are options for treating cystic echinococcosis:

- Percutaneous treatment involves using a technique called PAIR (puncture, aspiration, injection, re-aspiration) to treat the hydatid cysts.
- Surgery, specifically resection, can be used to remove the cysts.
- Anti-infective drug treatment can be employed to address the infection.
- "Watch and wait" involves monitoring the cysts over time without immediate intervention.

For liver cysts, a stage-specific approach is recommended. CE1 and CE3a cysts should be treated with either

albendazole alone (if they are less than 5 cm in diameter) or percutaneous treatment combined with medical therapy (if the cysts are 5-10 cm in diameter). For cysts larger than 10 cm, continuous catheterization may be a viable option. Inactive uncomplicated cysts can be managed expectantly, especially if they become spontaneously inactive (as opposed to treatment-induced inactivity) (Figure 3 & Table 2) <sup>13</sup>.

## Discussion

The coexistence of concurrent hydatid cyst and cancer in a patient necessitates a comprehensive, multidisciplinary approach involving the expertise of oncologists, hematologists, and infectious disease specialists. The choice of treatment for a cyst depends on its stage, complications, and local resources. Surgical and anti-infective drug may be used to manage symptoms. In the case of cancer, treatment plans are contingent upon the type and stage of the malignancy and may encompass surgical intervention, chemotherapy, radiation therapy, or targeted therapy. It is imperative to ensure the effective management of both conditions without compromising the overarching treatment plan, necessitating meticulous monitoring and coordination among the involved healthcare professionals.

In certain instances, prioritizing the treatment of one ailment over the other may be essential to mitigate the risk of treatment-related complications. Due consideration must be given to potential drug interactions between medications and chemotherapeutic agents, as well as the impact of the patient's immune status on the concurrent management of both diseases. Scrutinizing documented cases from specific healthcare facilities can furnish valuable insights into the challenges and successful strategies for managing concurrent hydatid cysts and cancer, thereby contributing to the formulation of optimal practices and guidelines for addressing analogous cases in the future. Based on these investigations, it is crucial to emphasize that the management of hydatid cysts and cancer should adhere to their respective treatment criteria without modifying the timing or nature of chemotherapy. In instances where a hydatid cyst and cancer coexist in a patient, the management of the hydatid cyst is determined exclusively by its stage, without necessitating alterations in the commencement of chemotherapy or adjustments to the chemotherapy regimen. The treatment criteria for each stage of the hydatid cyst are employed to determine its management, without mandating modifications to the type of chemotherapy or its management strategy.

In summary, the management of concurrent hydatid cysts and cancer necessitates a comprehensive, patient-centered approach, emphasizing personalized care, close collaboration among healthcare professionals, and a profound comprehension of the intricacies involved in simultaneously treating both conditions <sup>6,10,11,13,14</sup>.

## Conclusion

Research studies have demonstrated that the occurrence of hydatid cysts and cancer simultaneously is a rare phenomenon. According to case reports, when a patient is diagnosed with both these conditions, the coexistence of these two conditions does not affect their outcomes. It is recommended to treat each condition separately, based on their individual criteria. The cyst should be treated based on its stage, without altering chemotherapy, and the initiation and timing of chemotherapy may not need to be changed.

## AUTHOR CONTRIBUTION

**Shiva Shabani:** Conceptualization, writing—original draft, critical revision.

**Shirin Shabani:** Conceptualization, writing—original draft, critical revision.

**Yasaman Zarinfar :** critical revision

All authors read and approved the manuscript.

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## CONFLICT OF INTEREST STATEMENT

The authors declared no conflict of interest.

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## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

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### Figure legends:

**Figure 1: Activity based on the type of echinococcal cysts.** World Health Organization Informal Working Group on Echinococcosis standardized classification of echinococcal cysts (from reference number <sup>13</sup> ). CE, cystic echinococcosis; CL, cystic lesions.

**Figure 2: Ultrasound-based classification of hydatid cysts** The Pan American Health Organization (PAHO) and the WHO support Gharbi's and the WHO classifications for diagnostic imaging <sup>15</sup>.

**Figure 3 : Suggested treatment algorithm for hydatid cysts.** Cyst classifications according to the World Health Organization Informal Working Group on Echinococcosis. PAIR, puncture, aspiration, injection of scolecidal agent, re-aspiration<sup>13</sup> .

**Table 1. Cases where cancer and hydatid cyst occur together - characteristics of such cases.**

| Type of cancer         | Sex & Age          | Hydatid cyst presentation                               | who stage | Hydatid cyst management                 | Fallowup  | Outcome                  | Ref.                     |
|------------------------|--------------------|---------------------------------------------------------|-----------|-----------------------------------------|-----------|--------------------------|--------------------------|
| Colorectal cancer      | -                  | Incidental                                              | No data   | Surgery                                 | No data   | No data                  | 16                       |
| Gastric cancer         | Female/ 52 y       | Incidental                                              | No data   | Surgery(cystectomy)                     | No data   | No data                  | 17                       |
| Liver cancer           | Male/ 54 y         | Incidental                                              | No data   | Surgery(cystectomy)                     | No data   | No data                  | 17                       |
| Gastric cancer         | Male/ 48 y         | Incidental                                              | CE5       | Waite and watch                         | 1 year    | Without complication     | Our patients (2021-2023) |
| Breast cancer          | Female/ 45,50,65 y | Incidental                                              | CE3b      | Albendazole                             | 2 years   | Without complication     | Our patients (2021-2023) |
| Renal cell-carcinoma   | Female/ 727 y      | Mild tenderness in the right upper quadrant of abdomen. | No data   | Surgery(pericystectomy) and albendazole | 5 months  | Without complication     | 10                       |
| Ovarian cancer         | Female/ 55 y       | Incidental                                              | CE3b      | Albendazole and surgery                 | No data   | No data                  | 6                        |
| Endometrial cancer     | -                  | Pelvic mass                                             | No data   | Surgery                                 | 5 monthes | Without complication     | 11                       |
| Hematologic malignancy | Male/ 19 y         | Incidental                                              | CE1       | Waite and watch                         | 3monthes  | Cyst remain in cel stage | 12                       |

### Ghabis classification

Type I  
Type III  
Type II  
Type II

Type IV  
Type V  
Potentially parasitic cyst (very early stage of parasite development). WHO, World Health Organization; CE, cystic echinococcosis



