ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF SURGERY

Patterns and surgical treatment outcome of hydatid disease of the liver at Tikur Anbesa specialized Hospitals in Addis Ababa, Ethiopia, 2024

A thesis submitted to Addis Ababa University College of health sciences, department of surgery for the partial fulfillment of the requirements for the certificate in general surgery

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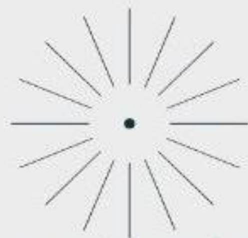

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I, the undersigned general surgery resident declare that I have submitted my original thesis on a title "Patterns and surgical treatment outcome of hydatid disease of the liver at Tikur Anbesa specialized Hospitals in Addis Ababa, Ethiopia " submitted as partial fulfillment of specialty certificate in General Surgery, Addis Ababa University

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Statement of the author

I hereby declare that this thesis is my original work and has not been presented for a degree in any other university and all sources of material used for this thesis have been duly acknowledged.

Name ________________

Signature ______________________

Date __________________

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Abstract

Background: Human echinococcosis, a zoonotic disease caused by Echinococcus tapeworms, occurs worldwide, with cystic echinococcosis found globally except in Antarctica and alveolar echinococcosis limited to the northern hemisphere. In 2020, 23 out of 27 EU/EEA countries reported 529 confirmed cases out of 624. Herbivores and omnivores serve as intermediate hosts, while carnivores are definitive hosts. Humans, as accidental intermediate hosts, do not transmit the parasite. From 2002 to 2006, 24 hydatidosis cases were detected among 36,402 ultrasound patients in Ethiopia

Objective: To describe the pattern and surgical treatment outcome of hydatid disease of liver at Tikur Anbesa specialized Hospitals, 2024 GC

Methods: Institution based retrospective descriptive cross-sectional study design was used to assess ''Patterns and surgical treatment outcome of hydatid disease of the liver at Tikur Anbesa specialized Hospital in Addis Ababa, Ethiopia in a study period. Convenience sampling technique was used

Result: Total of 30 patients diagnosed and managed for liver cystic echinococcosis (CE) were included in the study. The mean age of the patients was 37.5 years. Abdominal pain (n=28; 93.3%) was the most common presenting symptom, while a palpable abdominal mass (n=13; 43.3%) was the predominant presenting sign. Most patients had disease confined to the liver (n=28; 93.3%), with the right lobe being the most commonly affected (n=20; 66.7%). Imaging revealed that most patients had a single liver cyst (n=27; 90%). The majority of patients (n=21; 73.3%) were managed with surgical cystectomy. The most common complication observed was a perioperative surgical site infection

Conclusion - Clinical evaluation supplemented by imaging studies is required for diagnosis, and surgery remains the treatment of choice in most cases

Key words: Hydatid disease, Liver surgery, Echinococcosis, Surgical outcomes, Postoperative complications, Recurrence rate

Acronyms and abbreviations

HD - Hydatid Disease

CE - Cystic Echinococcosis

AE - Alveolar Echinococcosis

LFT - Liver Function Test

PAIR - Puncture, Aspiration, Injection, Re-aspiration

QOL - Quality of Life

LOS - Length of Stay

POC - Postoperative Complications

RR - Recurrence Rate

SOP - Standard Operating Procedure

ALT - Alanine Aminotransferase

AST - Aspartate Aminotransferase

EU/EEA - European Union/European Economic Area

WHO - World Health Organization

CDC - Centers for Disease Control and Prevention

OR - Operating Room

PEI - Percutaneous Ethanol Injection

POD - Postoperative Day

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1. Introduction

1.1 Background

Human echinococcosis is a zoonotic disease (a disease that is transmitted to humans from animals) that is caused by parasites, namely tapeworms of the genus Echinococcus. Cystic echinococcosis is found worldwide except in Antarctica, while alveolar echinococcosis is limited to the northern hemisphere, notably in China, Russia, continental Europe, and North America (1). Cystic echinococcosis is regarded as endemic in sub-Saharan Africa; however, for most countries only scarce data (2)

In 2020, 27 EU/EEA countries reported data on echinococcosis, with 23 countries reporting 624 cases, of which 529 (85%) were confirmed (3). The greatest prevalence of cystic echinococcosis in human and animal hosts is found in countries of the temperate zones, including several parts of Eurasia (the Mediterranean regions, southern and central parts of Russia, central Asia, China), Australia, some parts of America (especially South America) and north and east Africa. Echinococcosis is currently considered an endemic zoonotic disease in the Mediterranean region. The most frequent strain associated with human cystic echinococcosis appears to be the common sheep strain (4)

Between January 2002 and December 2006, 24 hydatidosis cases were recorded out of 36,402 patients admitted for ultrasound examination, resulting in an average annual incidence rate of about 2.3 cases per 100,000 per year. Ultrasound was the most frequently used diagnostic method (5). The majority (65%) of the patients came from rural Ethiopia, with 40% having frequent contact with domestic animals like dogs. Common symptoms were abdominal pain and abdominal mass, with 89.8% of cases presenting a palpable mass or hepatomegaly. Ultrasonography and computed tomography were the main diagnostic procedures (6)

Cystic echinococcosis is widespread in cattle slaughtered at Addis Ababa Abattoir enterprise. The observation of fertile cysts in examined organs suggests that cattle still play some role in the life cycle of this serious zoonosis and

presents potential risks of transmission to other intermediate hosts and human population (7)

The liver is the most common site of the hydatid cysts, followed by the lungs. Cysts in the spleen, kidneys, heart, bone and central nervous system are less common (7). Cysts were found in the right liver lobe in 55.5% of patients, the left lobe in 27.7%, and both lobes in 16.8%. Most patients (78.1%) had a solitary cyst, and 23 patients had hydatid cysts in other organs besides the liver (8)

1.2 – Statement of the problem

Cystic echinococcosis is widespread globally, except in Antarctica, while alveolar echinococcosis is limited to the northern hemisphere, notably in China, Russia, continental Europe, and North America. In regions where cystic echinococcosis is endemic, human incidence rates can exceed 50 per 100,000 person-years, with prevalence rates of 5%-10% in parts of Argentina, Peru, East Africa, Central Asia, and China. In hyper endemic areas of South America, livestock prevalence in slaughterhouses ranges from 20%-95% (1)

Over the past three decades, the global burden of CE has persistently remained high, especially in Central Asia, as well as North Africa and the Middle East. Efforts should focus on more effective prevention and control measures in these key regions and should specifically target vulnerable populations to prevent the escalation of epidemics (9), This disease causes a significant economic loss directly by causing organ or carcass condemnation and indirectly by affecting human and animal health, which increases the cost for diagnosis, treatment, and control of the disease (10)

The global burden of CE remains high, and it is recommended that more health resources are allocated to low-SDI regions, women and the elderly aged 55 to 65 years to reduce the disease burden of cystic echinococcosis (11)

Imaging is vital for determining the stage, size, location, and complications of cysts and assessing the suitability of minimally invasive PAIR treatment. Uncomplicated active cysts may be managed with chemotherapy alone or with PAIR, while inactive cysts can be observed with a "watch-and-wait" approach. Surgery is preferred for cysto-biliary fistula, significant extra-hepatic extension with high perforation risk, complicated cysts, or when percutaneous treatment expertise is lacking. Hydatid cysts should be considered in the differential diagnosis for various pathologies, including simple cysts, haematomas, necrotic tumors, cystic metastatic carcinoma, haemangiomas, abscesses, tuberculosis, and fungal infections (12)

There are many surgical procedures for the management of liver hydatid cysts. Much controversy exists regarding the most appropriate surgical technique, which should effectively eliminate the parasite as well have a low morbidity and mortality rate and a negligible recurrence rate. 1ndications for surgery in patients with liver hydatidoses are: (1) large cysts with multiple daughter cysts,

(2) single liver cysts situated superficially that may rupture, (3) infected cysts, (4) cysts communicating with the biliary tree, (5) cysts exerting pressure on adjacent vital organs, and (6) cysts in the lung, brain, bones, kidneys, and other organs (13)

1.3 – Significance of the study

The significance of the study on the patterns and outcomes of hydatid disease of liver management in Tikur Anbesa specialized hospital lies in several key areas:

• The study provides valuable data on the patterns and characteristics of hydatid disease in Tikur Anbesa specialized Hospital, offering insights into how the disease manifests in this specific population

• By highlighting the importance of imaging for diagnosing hydatid cysts, the study underscores the need for improved diagnostic facilities and training, which can lead to earlier and more accurate detection

• The findings can guide public health strategies to control and prevent hydatid disease, including educational campaigns and initiatives to reduce transmission from livestock to humans, which is a common issue in endemic areas like Ethiopia

- Overall, the study contributes to a better understanding of hydatid disease management in Tikur Anbesa specialized hospital , potentially leading to improved clinical practices, better health outcomes for patients, and more effective public health strategies

2. Literature Review

The most common presenting complaint was abdominal pain (90%), followed by an abdominal mass (30%). Prodromal symptoms were present in 50% of patients, and jaundice in 3.3% (14). Most patients had nonspecific abdominal symptoms, indicating that liver CE should be considered in the differential diagnosis, especially in endemic areas (15)

Significant advances in understanding Echinococcus biology, immune system interactions, and the development of specific immunological tests and PCR for parasite detection have expanded diagnostic tools. Improved surgical techniques, effective drugs (e.g., BMZ), and minimally invasive treatments (e.g., PAIR) have greatly enhanced the life expectancy and quality of life for patients with hydatid disease (16)

Ultrasonography supported by serology is the primary diagnostic method for E. granulosus infection. Treatment options include surgery, minimally invasive percutaneous drainage, and medical therapies (11). Surgery remains the best treatment, while percutaneous drainage is suitable for selected cases. Over the past 10 years, new sensitive diagnostic methods and effective therapeutic approaches have been developed (17)

A study done Iran on patterns of hydatid disease of liver, most patients (77.4%) had cysts only in the liver, with 65.9% located in the right liver segments. Radical surgery was performed on 17.7% of patients, while 82.3% underwent conservative surgery. Recurrence occurred in 15% of cases. Radical surgery had a lower recurrence rate but resulted in longer hospital stays compared to conservative surgery ($P < 0.05$). Recurrence remains a major challenge in managing hydatid cysts, despite the lower recurrence rate with radical surgery (18)

According to one study in Tikur Anbesa specialized hospital abdominal pain and mass were the most common symptoms, with 89.8% of cases showing a palpable mass or hepatomegaly? Ultrasonography and computed tomography were the main diagnostic tools. Cysts were located in the right liver lobe in 55.5% of patients, left lobe in 27.7%, and bilobar in 16.8%. Most patients (78.1%) had a solitary cyst. Twenty-three patients also had cysts in other organs. The surgical approach was mostly abdominal (89.1%), with some requiring thoracoabdominal (5.8%) or interval thoracotomy (5.1%). Conservative procedures were performed in 92% of patients, while radical

procedures were done in 8%. Postoperative complications occurred in 19.7% of patients (6) Primary or secondary Peritoneal hydatid cyst, represents an uncommon but significant manifestation of the disease. Prevention is the primary choice to reduce the incidence of the disease, but surgical removal of the cyst is the treatment of choice for this kind of disease (19)

This prospective cohort study included 136 patients who underwent surgery for non-liver hydatid cysts (NLHC) in Temuco between 2000 and 2015. The main outcomes measured were early and late postoperative morbidity (POM), hospital stay, mortality, and recurrence. Surgical techniques included total or subtotal pericystectomy and liver resection. The median patient age was 41 years, with 60.3% female. The median cyst diameter was 15.0 cm, and the median surgical time was 95 minutes. The incidence of POM was 9.6%, mostly Grade I or II Dindo & Clavien. There were no deaths, and with a median follow-up of 115 months, recurrence was observed in one patient (0.7% incidence). The study found a lower incidence and severity of POM compared to previous reports (20)

A study involving 60 patients compared open and laparoscopic surgery for treating hydatid liver cysts. Of these, 23 underwent open surgery and 37 underwent laparoscopic surgery with various types of procedures performed in each group. Cysto-biliary communication was found in 9 patients, and 10 underwent preoperative endoscopic retrograde cholangiography. Complications included hypernatremia in 1 patient, wound infections in 3, and perioperative hemorrhage in 3. Significant differences were found in cyst location and size between the two groups. Laparoscopic surgery resulted in shorter hospital stays; shorter operation times, less blood loss, faster recovery, and lower wound infection rates. Recurrence rates were 2.7% for laparoscopic surgery and 4.7% for open surgery (21)

According to study done in china on association between radical versus conservative surgery and short-term outcomes, Radical Surgery was associated with a 60% reduction in developing overall complication in the short term, but may result in more blood loss during surgery than Conservative surgery (22)

A study comparing minimally invasive and conventional surgery for treating hydatid liver cysts found that laparoscopic and robotic techniques offer expanded treatment options. These methods result in successful outcomes

regardless of cyst characteristics and provide advantages like shorter hospital stays and quicker recovery, making them valuable choices when combined with careful patient selection and appropriate surgical techniques (23)

A study of 352 patients operated on for liver hydatid disease (HD) found that 73 (20%) had complications, with 41 male and 32 female patients. The most common preoperative complications were intrabiliary rupture (33%) and suppuration (22%). Chest and abdominal pain (72.5%) and fever (56%) were the most common symptoms. Surgical procedures included unroofing and drainage (22%), and various complex procedures (46.5%) for intrabiliary rupture. Intraperitoneal rupture cases underwent laparotomy, evacuation, irrigation, and drainage (5.5%). One patient (1.36%) died, and the postoperative morbidity rate was 55%. The study concludes that complicated liver hydatid cysts present diverse challenges, but successful management is possible despite high postoperative complication rates (24).

Preoperative chemoprophylaxis with albendazole was administered to 33 patients (78.6%) for at least four days. The most common incision types were right subcostal and long midline. The liver was the primary site of disease in 30 cases (71.4%), with the right lobe affected in 73% of these. The retroperitoneum was involved in 3 patients, and the spleen, mesentery, and peritoneum each had 2 cases (4.7%) as the primary site of cysts. Thirty-eight (90.5%) patients underwent deroofing (of the cyst wall), evacuation (of the content), marsupialization (of the edge), and omentoplasty (obliteration of the cavity by placing omentum) (DEMO) Figure 2. None of the patients had perioperative anaphylaxis. Postoperatively, 37 (90.5%) patients took albendazole. Four (9.5%) of the patients had 6 postop complications: 4 surgical site infection and 2 bile leaks (25)

In a study conducted in Bangladesh, surgery was the main treatment for cysts, including cystectomy (16.3%), deroofing (13.8%), and aspiration (6.3%). Percutaneous procedures, such as PAIR (2.5%) and percutaneous aspiration (1.3%), were also used. Conservative treatment was administered to 16.3% of patients. Cysts were incidentally found in 30 patients. The most common complication after surgery was hemorrhage (32.4%), followed by biliary leakage (29.4%) and wound infection (23.5%). One patient (33.3%) developed

itching after a percutaneous procedure. In total, 34 patients underwent surgical treatment and histopathology (26)

Surgery was the preferred treatment in the study population, with 23 patients (43.4%) undergoing surgical intervention. Of these, 56.5% had laparoscopic procedures, while the rest had open surgery. The most common procedure was pericystectomy (60.9%), with 10 patients (43.5%) undergoing partial pericystectomy and 4 patients (17.4%) undergoing total pericystectomy. Other procedures included combined endocystectomy and pericystectomy (17.4%), endocystectomy (8.7%), partial cystectomy (8.7%), and exploratory laparotomy (4.3%). PAIR was used for the primary treatment of unilocular cysts (27)

A systematic review of 57 articles concluded that antihelminthic treatment for liver HC is better than placebo but not ideal alone (evidence level 2a, grade B). Radical surgery is generally preferred over conservative treatment (evidence level 2b, grade B). Omentoplasty with conservative surgery effectively prevents complications (evidence level 2b, grade B). More research is needed on recurrence rates after laparoscopic surgery for liver HC (evidence level 4, grade C). Combining ALB with surgery reduces recurrence risk compared to surgery alone (evidence level 2, grade C) (28)

A study on postoperative biliary fistula (PBF) among 282 patients (median age 23 years; 77.0% male) found that 74.5% underwent conservative surgery, 11.7% radical surgery, and 13.8% percutaneous drainage with PAIR procedure. PBF developed in 16.3% of patients within 5 days post-operation. The PBF group had significantly higher cyst diameters and preoperative alkaline phosphatase levels, with longer hospitalization. High preoperative alanine aminotransferase levels and attempts at fistula closure during surgery were significant predictors of PBF. Cyst diameter did not differ significantly between conservative surgery and biliary intervention groups, but the biliary intervention group had a significantly higher maximum drain output (29)

The operative and postoperative characteristics showed that the Radical surgery groups had significantly longer surgery durations (212.0 and 202.5 min vs. 173.2 min; $p < 0.05$) and higher blood loss (218.3 and 174.6 ml vs. 67.2 ml; $p < 0.05$) compared to the Conservative+Alb group. However, the Radical groups had significantly lower rates of postoperative complications (13.3% and 6.7% vs. 36%; $p < 0.05$) and pleural effusion ($p < 0.05$). The rate of Clavien–

Dindo grade 1 and 2 complications was higher in the Conservative+Alb group, primarily due to pleural effusion ($p < 0.05$). Bile leakage and intra-abdominal abscess rates were not significantly different. The Radical groups had shorter postoperative hospital stays (7.9 and 7.4 days vs. 11.3 days; $p < 0.05$). No relaparotomies or postoperative mortalities occurred in any group (30)

Sixteen patients underwent laparoscopic surgery and 20 had open surgery. The laparoscopic group had a significantly shorter mean operating time (110.0 min vs. 137.5 min; $p < 0.0001$) and required less postoperative analgesia (2.37 days vs. 6.85 days; $p < 0.0001$). Drain removal time was similar (4.56 days vs. 4.75 days; $p = 0.36$). The mean hospital stay was shorter for the laparoscopic group (5.87 days vs. 10.85 days; $p < 0.0001$), and they resumed routine activities earlier (11.56 days vs. 27.8 days; $p = 0.0006$). There was no significant difference in postoperative complications, though the open group had a slightly higher rate (31)

All patients underwent surgical treatment and were classified into two groups. Group A (63 patients) had external drainage (42 patients), marsupialization (12 patients), or simple cyst closure (9 patients). Group B (224 patients) had partial cystectomy with omentoplasty (153 patients), pericystectomy (17 patients), left lateral segmentectomy (3 patients), and other specific procedures. Omentoplasty and radical procedures had lower complication rates compared to marsupialization and external drainage. Conservative techniques, like omentoplasty, effectively control hepatic hydatidosis and are preferred when possible (32)

3. Objective

3.1 General objective

To describe the pattern and surgical treatment outcome of hydatid disease of liver surgery done at Tikur Anbesa specialized Hospital, 2024 GC.

3.2 Specific objectives

- To assess the demographic characteristics of patients diagnosed with hydatid disease of the liver at Tikur Anbesa specialized Hospitals, 2024
- To evaluate the diagnostic pattern of various imaging modalities in detecting hydatid cysts in the liver at Tikur Anbesa specialized Hospitals, 2024
- To assess the types of different surgical treatment options in managing hydatid disease of liver at Tikur Anbesa specialized Hospitals, 2024
- To determine the post-op complication following surgical treatment in managing hydatid disease of liver at Tikur Anbesa specialized Hospital,2024

4. Research Design and Methodology

4.1 Study area and study period

The study was conducted at Tikur Anbessa specialized Hospital, Addis Ababa, Ethiopia, on patients who had surgery on hydatid disease of liver from April 2018 to April 2024

The study was conducted by reviewing records of patients with hydatid disease of the liver who underwent surgery during the study period.

4.2 Study design

Institution based a retrospective quantitative cross-sectional study designs was used

4.3 Source and study Population

4.3.1 Source population

The source population was all operated patients at the surgical departments of the Tikur Anbesa specialized Hospital from April, 2018 – April 2024

4.3.2 Study population

All adult hydatid disease of the liver patients admitted to surgical department during the study period

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

All adults with hydatid cyst of the liver aged 15 and above who had undergone surgery

4.4.2 Exclusion criteria

- Patients younger than 15 years of age

- Patients referred from other hospitals after operation
- Patients whose chart is incomplete

4.5 – Sample size determination

The sample size required was determined based on single proportion population formula with the assumption of 10 % marginal error (d), 90% confidence level (z). Post-operative complication occur in study done at Tikur Anbesa specialized hospital 19%

Using n = (zα/2)2 p (1-p)/ d2

Where,

n=required sample size

Zα/2=critical value for normal distribution at 90% confidence level which equals to 1.645

(Z value at α=0.1)

p = Pattern and outcome of hydatid disease of surgery

D =desired precision with 10% marginal error

n =1.645 *0.19(1-0.19)/0.1^2

n = 41

By adding 10% for incomplete data, the total sample size will be 45

- **Due to limited number of patients , all patients (n-30)was taken**

4.6 – Variables

4.6.1 - Dependent Variables

- Patterns of surgery and
- Surgical Outcomes: Postoperative complications (e.g., infection, bile leak, hemorrhage), Length of hospital stay, Morbidity rate ,Recurrence rate of hydatid cysts

4.6.2 - Independent Variables

- Age
- Gender
- BMI (Body Mass Index)
- Comorbidities (e.g., diabetes, hypertension)

- Disease Characteristics: Size and number of hydatid cysts, Location of cysts within the liver
- Presence of cyst complications (e.g., rupture, secondary bacterial infection)
- Surgical Details: Type of surgical procedure (e.g., open surgery, laparoscopic surgery, percutaneous drainage)
- Use of antiparasitic medication pre- and post-surgery

4.7 Data collection tools

Data were collected using a structured tool prepared in English. Initial patient information for those who underwent surgery for hydatid disease of the liver was retrieved from operation logbooks. Patient charts were collected, and principal investigator was responsible for data collection. Only complete patient charts that met the inclusion criteria were included in the study. To ensure completeness and accuracy, the primary investigator rechecked all data collection forms

4.8 Data processing and Analysis

The data was entered to SPSS, version 24 for analysis. Descriptive statistics was used to present the results to frequency, percentage, mean and standard deviation. Chi square or Fischer's extract. A p value of 0.05 or less was considered statically significant

4.9 Data quality control

Various precautions and data quality control mechanisms were integrated into all stages of the data management process to ensure data quality. These measures included pre-testing the data collection tool, closely performing the data collection process, and verifying the completeness and accuracy of the collected data

4.10 Ethical Consideration

Letter of permission was obtained from AAUCHS, IRB (Institutional Review Board). Then cooperation letter will be sent for Tikur Anbesa, to obtain consent to perform data collection. Confidentiality of patient information was maintained by taking the data anonymously. The data extracted from medical registration charts was only be used for the study and every data was kept confidential

4.11 Dissemination plan

The findings of the study will be presented during final thesis defense at AAU College of health sciences. Copies of the final thesis will be sent to libraries of AAU and to Addis Ababa health administration and ministry of health bureau

5. Result

1. 1. Sociodemographic characteristics

Among the 30 patients diagnosed with hydatid disease of the liver at Tikur Anbesa Specialized Hospital, the majority were female (63.3%, n = 19), while males accounted for 36.7% (n = 11).

Regarding age distribution, 10 patients were between 15–24 years, followed by 6 patients in the 25–34 age group, 4 patients in the 35–44 age group, and 5 patients each in the 45–54 and >55 age groups

Table 1- Tables shows Sociodemographic characteristics of hydatid disease of liver patients at TASH Addis Ababa, 2024

		Count	Table N %
sex of respondents	male	11	36.7%
	female	19	63.3%
Age of respondents	15-24	10	33.3%
	25-34	6	20.0%
	35-44	4	13.3%
	45-54	5	16.7%
	>55	5	16.7%
place of residence	urban	12	40.0%
	rural	18	60.0%
occupation of respondents	farmer	10	33.3%
	driver	1	3.3%
	teacher	1	3.3%
	merchant	5	16.7%
	butcher	0	0.0%
	other	8	26.7%
	housewife	5	16.7%
personal history of hydatid cyst	yes	2	6.7%
	no	28	93.3%
comorbidity	DM	1	3.3%
	hypertension	3	10.0%
	Chronic liver disease	0	0.0%
	RVI	3	10.0%
	Other	4	13.3%
	No	19	63.3%
history of previous surgery	yes	1	3.3%
	no	29	96.7%

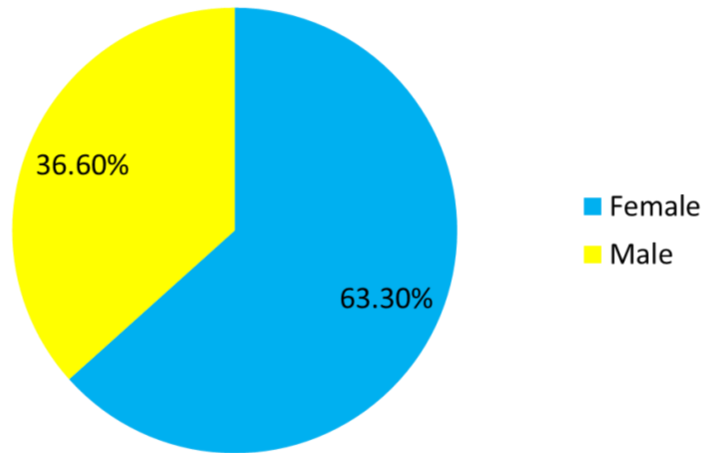

Figure 1 Sexual distribution of hydatid disease of liver patients at TASH Addis Ababa Ethiopia, 2024

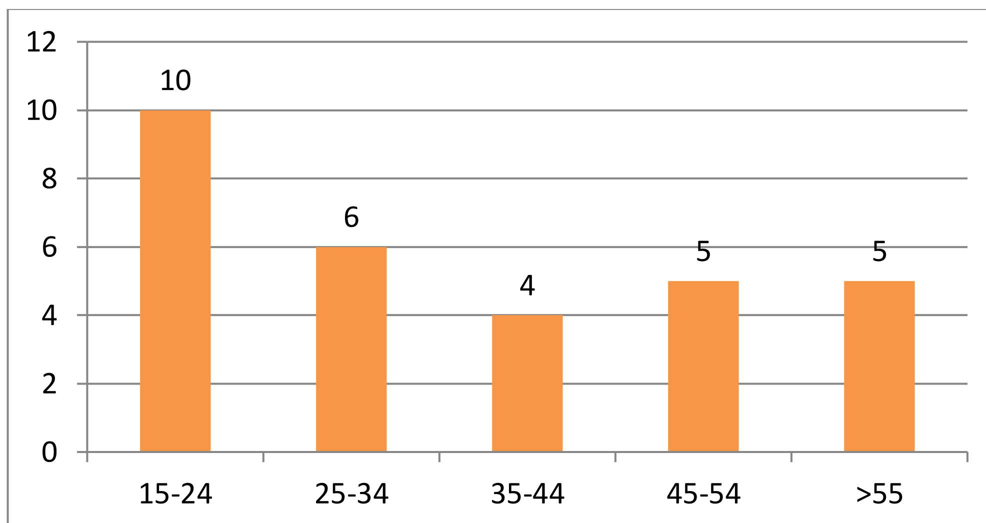

Figure 2- Age Distribution of patients with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

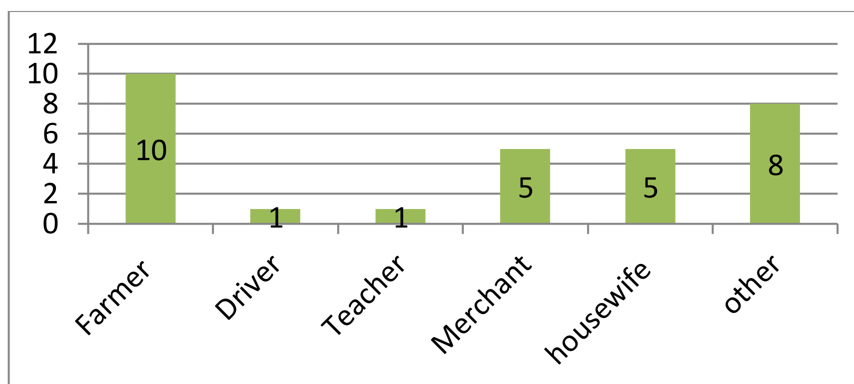

Figure 3- Distribution of occupation of patients with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

The overall gender distribution favours females (19 females vs. 11 males), making females 63.3% of the total population sampled. Urban areas are predominantly female (83.3%), while rural areas show an even distribution between males and females

Table 2- Table shows residency status of patients with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

place of residence					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	urban	12	40.0	40.0	40.0
	rural	18	60.0	60.0	100.0
	Total	30	100.0	100.0	

Regarding comorbidity status, 19 patients (63.3%) had no comorbidities, while 3 patients (10%) had hypertension, 3 (10%) had retroviral infection (RVI), 1 (3.3%) had diabetes mellitus (DM), and 4 (13.3%) had other comorbidities.

Only 2 patients (6.7%) had a history of hydatid disease, while the remaining 28 patients (93.3%) had no such history. Additionally, only 1 patient (3.3%) had a history of previous surgery, whereas 29 patients (96.7%) reported no prior surgeries

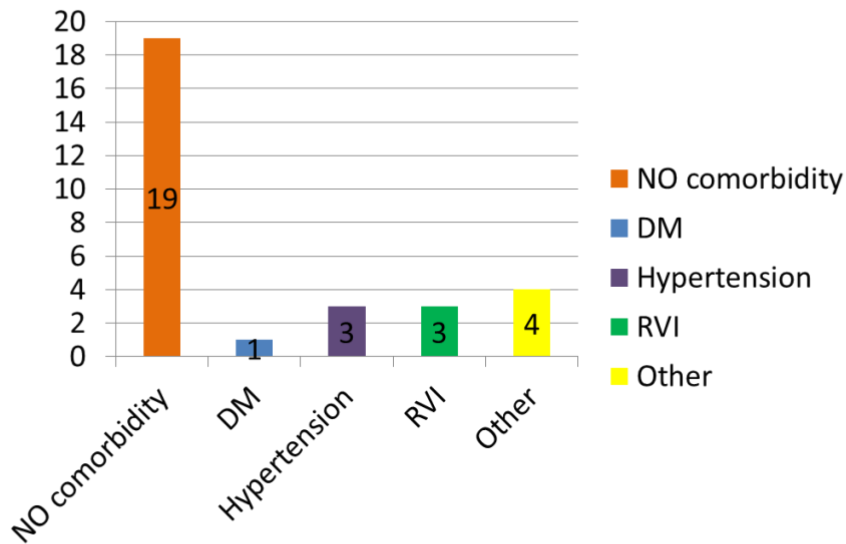

Figure 4- Distribution of occupation of patients with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

The majority of patients (93.3 %, n=28) presented with abdominal pain as the primary symptom. 11 patients (36.7%) presented with abdominal swelling, 8 patients presenting with weight loss and one patient presenting with yellowish discoloration of the eye

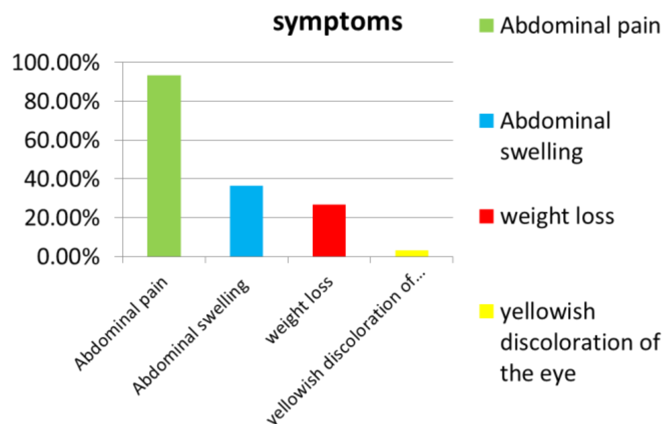

Figure 5- Presenting symptoms of patients with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

Among the 30 patients with hydatid disease of the liver, 13 patients (43.3%) presented with abdominal mass/hepatomegaly, 5 patients (16.7%) presented with abdominal tenderness, and 1 patient (3.3%) had jaundice, the other 11 patients had no any physical examination finding

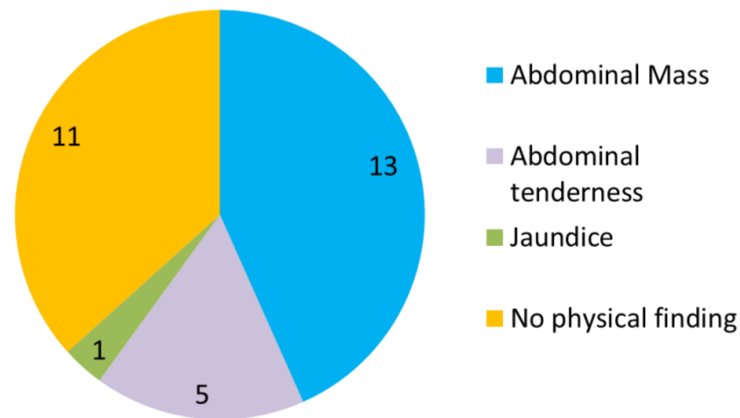

Figure 6- Physical examination finding of a patient with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

Regarding the duration of symptoms, 11 patients (36.7%) presented within 6–12 months, 9 patients (30%) had symptoms for less than 6 months, and another 9 patients (30%) reported symptoms lasting more than 18 months, and 1 patient (3.3%) presented with symptoms lasting 12–18 months.

Among the 30 patients with hydatid disease of the liver, 25 patients (83.3%) were diagnosed using both CT and abdominal ultrasound. This was followed by 3 patients (10%) diagnosed with CT alone and 2 patients (6.7%) diagnosed with abdominal ultrasound alone

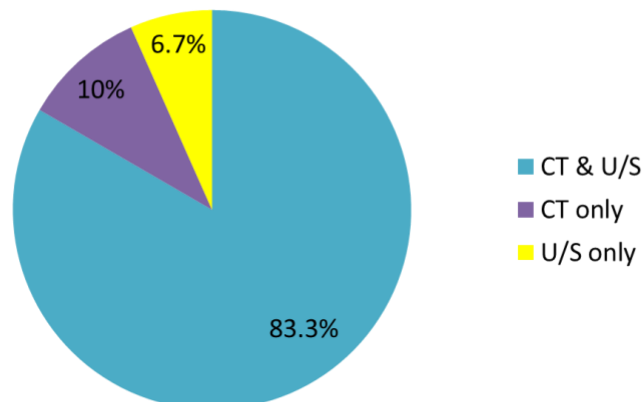

Figure 7- How diagnosis made for hydatid disease of liver patients at TASH Addis Ababa Ethiopia, 2024

Cysts were located in the right lobe in 66.7% of cases (n=20) and in the left lobe in 33.3% (n=10). Segmental distribution was as follows: 6 patients each in segments 6/7 and 5; 5 patients each in segments 6 and 3; 2 patients each in segments 4 and 7; and 1 patient each in segments 5/8 and 6/7/8

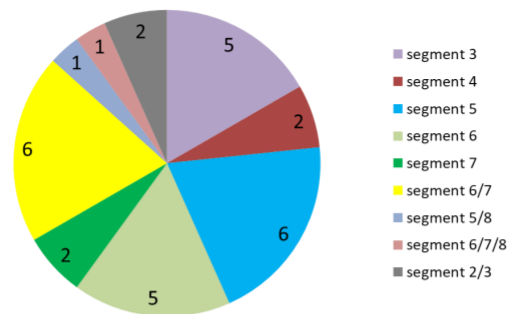

Figure 8- Distribution of cyst in liver segments of patients with hydatid disease of liver at TASH, Addis Ababa Ethiopia, 2024

Of the 30 patients, 18 (60%) had cysts measuring 10–20 cm, while 12 (40%) had cysts smaller than 10 cm. regarding the number of cysts, 27 patients (90%) had a single cyst, 2 (6.7%) had two cysts, and 1 (3.3%) had three cysts. Among those with liver hydatid disease, 28 patients (93.3%) had simple cysts, and 2 (6.7%) had complicated cysts. Liver function tests were normal in 25 patients (83.3%) and abnormal in 5 patients (16.7%)

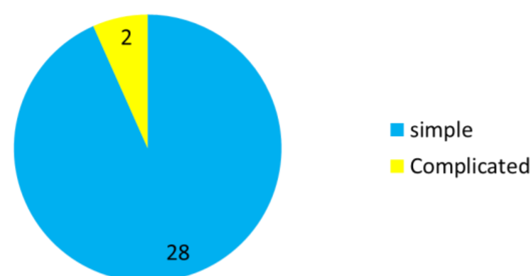

Figure 9- Characteristics of the cyst in patients with hydatid disease of liver at TASH Addis Ababa Ethiopia, 2024

Among 30 patients who underwent surgery for hydatid liver disease 28 patients was abdominal approach and 2 patients was both abdominal and thoracic approach, 21 (73.3%) had cystectomy, 4(13.3 %) underwent cystectomy with fistula ligation, 4 (13.3%) had cystectomy with omentoplasty, and 1 patient had a partial pericystectomy. Hydrogen peroxide was used as a scolicidal agent in

86.7% of cases, normal saline in 6.7%, and povidone iodine and diluted formalin in 3.3 % of patients

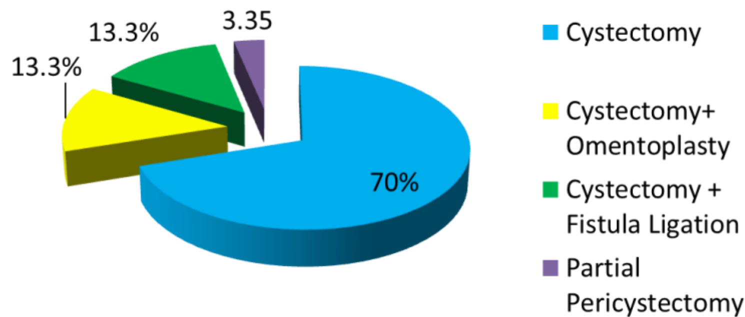

Figure 10- Types of surgery done for hydatid disease of liver patients at TASH Addis Ababa Ethiopia, 2024

Among 30 patients who underwent surgery for hydatid liver disease, 3 (10%) experienced postoperative complications. One patient suffered intraoperative anaphylactic shock and postoperative fluid collection. She was initially managed in the ICU, survived, and later underwent percutaneous drainage for the collection. Two patients developed superficial surgical site infections, which were treated with wound care. There was no record recurrence

A drain was used intra-operatively in all patients (100%), and all received albendazole peri-operatively. The mean follow-up duration was 5.5 months ranges from (1-48 months)

6. Discussion

Our study retrospectively analyzed the demographic and clinical features of 30 patients diagnosed with hepatic CE at Tikur Anbesa Specialized Hospital. Most patients were female (63.3%), while males accounted for 36.7%. This aligns with studies from Iran and South Africa, where females constituted 60.9% and 58.9% of cases, respectively (15, 18)

The majority of patients (93.3%) in our study presented with abdominal pain as the primary symptom, while 36.7% had abdominal swelling. Additionally, eight patients presented with weight loss, and one patient reported yellowish discoloration of the eye. These findings align with a study conducted in Ethiopia, where 84% of patients experienced abdominal pain and 72.3% had a palpable abdominal mass. Similarly, a South African study reported abdominal pain in 69.9% of patients and abdominal swelling in 48%, which is comparable to our results (6, 15)

Diagnosis of hepatic hydatid disease was achieved using CT and ultrasound in 83.3% of cases, CT alone in 10%, and ultrasound alone in 6.7%. Cysts were predominantly located in the right lobe (66.7%) compared to the left lobe (33.3%). Most patients (90%) had a single cyst, while 6.7% had two cysts, and 3.3% had three cysts. A study conducted in Nepal reported similar findings, with USG used in 73.5% of cases and CT in 77.3%. Cyst dimensions ranged from 2.5 cm to 17 cm. Single hepatic cysts were observed in 70.6% of patients, and multiple cysts in 29.4%, with the right lobe most frequently involved (78%), consistent with our study (32,25)

Surgery remains the gold standard for treating hepatic hydatid liver disease (HLD), though complete removal of the parasitic mass is not always fully effective. The main surgical principles are: (1) removal of all infective components from the cyst, (2) prevention of cyst content spillage into the abdomen, (3) management of the residual cavity, and (4) identification and treatment of any biliary tract communication. Surgical approaches are divided into conservative surgery, where the pericyst is not resected but the germinal and laminated membranes are, and radical surgery, where the pericyst is included in the resection (33)

Conservative surgery is a safe and technically simple procedure that requires short operative time and can be employed regardless of where the cyst is located. The conservative approach is primarily supported from endemic areas who emphasize the need for a safe and reliable first-line treatment. Conservative surgical options such as cystectomy are more widely practiced than radical approaches, because they are relatively safe and more straightforward to perform (6, 15, and 33). In our study 21 (73.3%) had cystectomy, 4 (16.7%) underwent cystectomy with fistula ligation, 4 (6.7%) had cystectomy with omentoplasty, and 1 patient had a partial pericystectomy, which is comparable with the above study

The risk of cyst spread necessitates the elimination of vital scolices to prevent secondary hydatidosis (34). In our study, scolicidal agents were used in all patients: hydrogen peroxide in 86.7% of cases, normal saline in 6.7%, and povidone iodine or diluted formalin in 1%. Similarly, a study in Addis Ababa reported intraoperative use of scolicidal agents in 90.5% of patients, with tissue protection using sponges soaked in 2% formalin or, less commonly, 70% alcohol. This indicates a shift from formalin to hydrogen peroxide, warranting further research to compare their outcomes (6)

Among 30 patients who underwent surgery for hydatid liver disease, 3 (10%) experienced postoperative complications, with no mortality recorded in this study. One patient had an intraoperative anaphylactic shock and postoperative fluid collection, requiring ICU management and subsequent percutaneous drainage. Two patients developed superficial surgical site infections, successfully treated with wound care. This is comparable to a study from South Africa, which reported perioperative surgical site infections in 5.4% of cases, a single iatrogenic pleural breach (2.7%) during partial cystectomy, and perioperative bile leak as the most common complication, occurring in 14 patients (37.8%). (15)

7. Conclusion

This study examines the prevalence, characteristics, and management outcomes of liver hydatid disease in Ethiopia. The majority of patients presented with abdominal pain and swelling, with cysts predominantly located in the right lobe. Most patients had a single cyst, and simple cysts were more common than complicated ones. Conservative surgical options, such as partial cystectomy, are more widely practiced than radical approaches due to their safety and straightforward nature. The consistent use of intra-operative drainage and peri-operative albendazole contributed to positive management outcomes. These findings emphasize the need for early diagnosis and appropriate surgical and pharmacological interventions in managing hydatid disease in Ethiopia, where it remains a significant health challenge. Further studies and increased awareness are crucial to enhancing early detection and treatment strategies

8. Limitation of the study

- The study includes only 30 patients, which may limit the generalizability of the findings to larger populations or different settings
- As a retrospective study, it relies on previously recorded data, which may be incomplete, inconsistent, or biased. This could affect the accuracy of the analysis
- Incomplete medical records or missing preoperative/postoperative information could reduce the robustness of the analysis
- conducted at a single institution, the findings might not be applicable to other settings with different resources, patient populations, or clinical practices

9. Recommendation

- **Conduct Prospective Studies**: Future research should adopt a prospective design to ensure better data quality, minimize bias, and allow for standardized data collection
- **Increase Sample Size**: Larger studies with a more diverse patient population are needed to validate the findings and improve generalizability
- **Perform Multi-Center Studies**: Conducting the study across multiple institutions can provide more representative data and account for regional or institutional differences in surgical practices
- **Standardize Data Collection**: Establish standardized protocols for data collection to minimize inconsistencies and ensure that all relevant variables are thoroughly documented
- **Include Long-Term Outcomes**: Future studies should focus on capturing long-term postoperative outcomes, including functional recovery, patient satisfaction, and recurrence rates.

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Data collection tool

Section 1: Patient Demographics

1. **Patient ID:** ________________________
2. **Age:** _____________________________
3. **Gender:**
   - Male
   - Female
   - Other
4. **Height (cm):** ______________________
5. **Weight (kg):** ______________________
6. **Residence:**
   - Urban
   - Rural
7. **Occupation:** ________________________

Section 2: Medical History

1. **History of Hydatid Disease:**
   - Yes
   - No
2. **Family History of Hydatid Disease:**
   - Yes
   - No
3. **Comorbidities:**
   - Diabetes
   - Hypertension

- Chronic Liver Disease
- Other (specify): ______________________

4. **Previous Surgeries:**
   - Yes (specify): ______________________
   - No

Section 3: Clinical Presentation

1. **Symptoms:**
   - Abdominal pain
   - Nausea
   - Vomiting
   - Jaundice
   - Weight loss
   - Fever
   - Other (specify): ______________________
2. **Duration of Symptoms (months): ________**
3. **Physical Examination Findings:**
   - Hepatomegaly
   - Abdominal tenderness
   - Jaundice
   - Other (specify): ______________________

Section 4: Diagnostic Imaging and Tests

1. **Imaging Modality Used:**
   - Ultrasound
   - CT Scan

- MRI
- Other (specify): ______________________

2. **Size of Cyst (cm): ______________________**
3. **Location of Cyst:**
   - Right lobe
   - Left lobe
   - Both lobes
4. **Number of Cysts: ______________________**
5. **Cyst Characteristics:**
   - Simple
   - Complex (with daughter cysts, septations)

Section 5: Laboratory Results

1. **Liver Function Tests:**
   - ALT: _____________
   - AST: _____________
   - Bilirubin: _____________
   - Alkaline Phosphatase: _____________
2. **Eosinophil Count: ________________**
3. **Hydatid Serology:**
   - Positive
   - Negative

Section 6: Treatment Details

1. **Type of Treatment:**
   - Medical (Albendazole, Mebendazole)

- Surgical
- Percutaneous Aspiration
- PAIR (Puncture, Aspiration, Injection, Re-aspiration)
- Other (specify): ______________________

2. **Duration of Medical Treatment (weeks):** _________________

3. **Surgical Procedure Performed:**
   - Cystectomy
   - Liver Resection
   - Other (specify): ______________________

Section 7: Outcomes

1. **Immediate Complications:**
   - Yes (specify): ______________________
   - No

2. **Long-term Complications:**
   - Recurrence
   - Biliary Fistula
   - Liver Abscess
   - Other (specify): ______________________

3. **Follow-up Period (months):** ____________

4. **Status at Last Follow-up:**
   - Disease-Free
   - Recurrence
   - Under Treatment
   - Deceased

5. **Quality of Life (Patient Self-Assessment):**

    - Excellent
    - Good
    - Fair
    - Poor