

Review Of Hepatic Hydatid Cyst a Prospective Study Of (50) Cases At Al-yarmouk Teaching Hospital

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ABSTRACT

Background: Hydatid disease, or Echinococcosis, is a zoonosis that occurs primarily in sheep-razing areas of the world, but is a worldwide health problem as a result of increased travel & emigration.

It is common in IRAQ & most countries of the Middle East **Aim of the study:** A prospective study of patients with hepatic hydatid cysts are studied in all aspects of the disease. The outcome was compared with the national and international studies. **Patients & methods:** This study was based on data collected from patients, admitted and treated surgically for hepatic hydatid cyst, at Al-yarmouk Teaching Hospital in Baghdad & studied prospectively for the period from (Oct.2008-Oct.2010). **Results:** There were 36 females and 14 males. The highest number of patients was from Baghdad. Six (12%) patients were asymptomatic & were accidentally discovered to have hepatic hydatid disease, While 44(88%) were symptomatic. Upper abdominal pain was the most common presenting symptom in 76% of patients. Most of the cysts were in segment 7 (26.1%) & in segment 8 (23.9%). More than half of patients had one cyst (54%). In 24% of patients, the cysts were communicated to the biliary tree at the time of diagnosis. The liver was the only involved organ in 84% of cases. The treatment was by surgery alone or with addition of medical treatment. Partial pericystectomy (drainage & evacuation) was the way to deal with the cyst in 92% of the cases. Exploration of CBD was done in 6% of cases, while ERCP was done in 2% of the cases preoperatively to deal with CBD obstruction. Scolicidal agents were used in 96% of cases. The residual cavity was dealt with, in most cases by omentoplasty with or without intracystic drain (in 48% of patients), or by excision & external drainage (in 36% of patients). The cysts were inactive in 28% of cases. Emergency presentations constitute 4% of cases. The common postoperative complications were: chest infection (14%) & bile leak (12%). There was no mortality in this study. **Conclusions:** Most patients are young, presented with abdominal pain. Liver is the commonest involved organ. Segment 7 & 8 are the most commonly involved segments. Exploration of CBD for jaundiced patients was done in 6% of cases. Recurrent presentation occurs in 14%. Partial pericystectomy with omentoplasty was the commonest procedure used with low morbidity and can be recommended in the management of hepatic hydatid cysts.

Introduction:

Hydatid disease is one of the oldest diseases known to man, the word Hydatid is Latin in origin (hyadatis) meaning a drop of water ¹. Leuchart (1867) was the first to give a complete & accurate account of the life cycle & morphology of parasite ². In recent years laparoscopic surgical techniques to treat hydatid disease of the liver have been gradually introduced ³. Human echinococcosis (hydatosis, hydatid disease) is caused by the larval stage of cestode (tape worm) of the genus *Echinococcus* which include subtypes of:

- 1- *Echinococcus granulosus*;
- 2- *Echinococcus multilocularis*
- 3- *Echinococcus vogeli*;
- 4- *Echinococcus oligarthus* (1,2,3) species have been generally accepted as parasite of human ⁴

Hydatid disease is a zoonotic infection that has a world-wide distribution ⁵. It is endemic in many cattle raising regions of the Mediterranean and Middle East countries (including IRAQ), Far East, South America, Australia & certain areas of North America ^{6,7}. Hydatid liver disease affects all age groups, both sexes equally, and no predisposing pathologic conditions are associated with infection ⁶. The egg hatch in the small intestine & each releases a six hooked embryo which burrows through the wall to enter the portal circulation. Most of the embryos are filtered out & trapped in the liver or lung, but some may escape these two filters to enter the general circulation & settle down in other organs, including: the brain, kidneys, bones, eyes or the spleen. The embryos become encysted & grow slowly reaching 5-10 mm in diameter in 3-6

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The cyst may continue to grow for many years & can eventually contain up to 5 liters or more of fluid. There may be more than one cyst in one organ or numerous cysts in different parts of the body⁴.

At this stage the parasite has a characteristic 3 layered structure made up of:

- An outer pericyst derived from compressed host organ tissues.
- An intermediate hyaline ectocyst which is non-infective.
- An inner endocyst that is the germinal membrane and contains viable parasites which can separate forming daughter cysts

The parasite has only 2 layers in the lung, brain & peritoneal cavity⁸.

Classifications of hydatid disease:

I. Hydatid liver cysts: are classified as:

1. Primary cysts: these are single cysts with a host capsule consisting of compressed liver tissue.
2. Multivesicular or secondary cysts: the primary cyst in the liver ruptures to form daughter cyst each of which in every respect is similar to primary cyst, except that, it does not have its own capsule.
3. Secondary abdominal implantations: hydatid cyst spills into the adjacent cavities, & may become secondarily implanted².

II. There is another classification (**GHARBI**) which is used to categorize hydatid cysts as following:

- type I: cyst with clear fluid.
- type II: cyst with non-clear fluid & dislodged membrane.
- type III: presence of daughter cysts inside.
- type IV: cysts with heterogeneous echogenic masses
- type V: cysts with calcified wall⁹.

Clinical Features:

Hydatid cyst usually grows very slowly, & is often:

1. Symptomless, unless they cause pressure on vital organs, or if they rupture spontaneously or in case of an injury. The resulting symptoms depend upon the site, type & rate of growth of cystic lesion¹⁰.
2. Symptomatic: with simple or uncomplicated cyst, by pressure on adjacent organs:
 - Abdominal pain & tenderness &/or palpable mass.
 - Jaundice or ascites (uncommon).
 - Tender Hepatomegaly, chills, spiking fever with secondary infection.
 - Urticaria & erythema: evidence of generalized anaphylactic reaction.
 - Biliary colic, jaundice & urticaria: with biliary rupture
 - Vomiting, with passage of the hydatid membrane in the emesis: hydatid emesis
 - Passage of membrane in the stool: hydatid enteria.
 - Passage of membrane in the sputum with cough.
 - Cysts in other organs can present with: splenomegaly, hematuria, paraplegia, goiter and ophthalmous¹¹

Diagnosis:

1. History: history of contact with dogs or sheep, abdominal pain, dyspepsia, and vomiting.
2. Physical examination: palpable mass, urticaria, erythema, evidence for generalized anaphylactic reaction when ruptured, & jaundice if the cyst ruptures into the biliary tree¹¹.
3. Laboratory diagnosis:
 - Liver function tests.
 - Eosinophilia: is positive in 25% of cases¹¹.
 - Indirect fluorescent antibody.
 - Immunoelectrophoresis.
 - Enzyme linked immunosorbent assay [ELISA].
 - Dot immunobinding assay [DIA]: for the detection of hydatid antigen specific antibodies.
 - HA-DIA [ECHINOSTRIP] is of good predictive value, allow for speedy diagnosis in the office. Overall sensitivity of the test for serum antibody detection in cystic echinococcosis remains in the range of 50-80%.
 - Casoni intra dermal test
 - Weinberg complement fixation test. (The last two tests are widely abandoned, because of their unreliability)¹².
4. Imaging technique:
 - Plain radiograph⁴.
 - Radioisotope scanning:⁸
 - Ultrasound study⁹.
 - Computed tomography:¹³
 - Endoscopic retrograde cholangio-pancreaticography (ERCP):¹⁴.
 - MRI & MRCP:¹⁴

Treatment:

1. Medical treatment with (BENZIMEDAZOLE COMPOUNDS): It is used alone or combined with PAIR. When cyst can't be removed, it's a valid alternative treatment to surgery.^{15,17} Inoperable cases can be treated with albendazole or mebendazole. An overall response rate of 55-79% has been documented, with cure in 29% of cases¹⁸. Patient usually pretreated for a short time [10-14 days] with scolicidal agent, such as albendazole prior to definite surgery or percutaneous drainage⁴.
2. PAIR: The PAIR procedure, it was firstly proposed in 1986 by a Tunisian team. It consists of percutaneous puncture of cyst, aspiration of a substantial amount of cyst fluid, injection of protoscolicidal substance. The most frequently utilized protoscolicidal agents used for percutaneous treatment is 1520% saline and mebendazole solution¹⁵, for a minimum 15 minute & then re-aspiration of fluid cyst content. When properly performed by trained radiologist & surgeon, PAIR has proven safe & effective. More than 500 favorable PAIR

intervention have been reported within 5 year follow up period. The surgical complication rate post operatively is 10-25%, the operation mortality is probably less than 2%, the long term recurrence rate after surgery is 2-10%⁴. The efficacy of PAIR in managing hydatid cysts is greater than 75%¹⁹.

3. Surgical Treatment: Recommended for both symptomatic & asymptomatic cases. Although various surgical methods have their advocates, centers with wide experience tend to favor the most conservative approach²⁰.

Surgical procedures:

1. Endocystectomy
2. Partial pericystectomy (conservative resection) [with, or without obliteration of the residual cavity].
3. Total cystopericystectomy
 - Closed, without wall opening.
 - Open, with evacuation
3. Liver resection
 - a. Anatomical resection.
 - b. Non-anatomical resection⁴.
4. Laparoscopic: Puncture, aspiration, irrigation & evacuation
 - a. Cystostomy [puncture only].
 - b. Cystostomy with intra cystic closed suction drainage.
 - c. Partial pericystectomy without drainage.
 - d. Partial pericystectomy with drainage²¹.

Methods Used For Obliteration Of Residual Cavity After Surgery:

- External drainage
- Reapproximation (capitonnage).
- Obliteration with omentum (omentoplasty), with or without external drainage.
- Left open to the peritoneal cavity.
- Marsupialization procedures²⁷.

PATIENTS & METHODS:

Fifty cases of hepatic hydatosis were studied prospectively at AL-Yarmook Teaching Hospital in Baghdad, for a period of two years (Oct. 2008 - Oct. 2010). Cases collected were received from the hospital surgical clinic & private clinics. All patients were evaluated by history interrogation regarding their occupation, residency (urban or rural), main complaint to seek medical advice, other related symptoms and past history of same problem. Patients were examined for their general condition and abdominally for a palpable mass. Proper examination of the abdomen & other organs was done to detect other affected organs and to decide patient's fitness for surgery. The study includes only patients who had operation for their pathology. All patients were investigated by the following:

Complete blood picture, white cell count & ESR, Liver function tests, bleeding profile. Blood urea, serum creatinine, blood sugar and ECG were ordered for those over 40 years of age and in others when indicated. Abdominal ultrasound & chest x-ray was done for all patients. CT scan of the abdomen was done for all elective cases. Plain X ray of the abdomen, MRI, MRCP, ERCP and pulmonary function tests were done for patients as indicated. All patients were admitted to the surgical ward & treated surgically. Medical treatment with antihelminthic drugs (Mebendazole, Albendazole or Praziquantel) in the perioperative period was given according to the team preference. Some had this drug in the pre and post operative period, while others in the post-operative period only for one month in most cases. Another group did not receive such medication. Under general anesthesia, patients were explored through a suitable incision. Information about surgical procedures were documented. All patients were followed post-operatively until their discharge. During their stay, post-operative complications were collected.

Results:

A total of 50 patients with hepatic hydatid cysts were studied prospectively for the period from (Oct. 2008 - Oct. 2010). & the results were as below:

Age distribution showed that the highest incidence occurred in the 3rd decade which includes 17(34%) patients, followed by the 6th decade includes 10(20%) patients. The number of patients in the 4th & 5th decades was 9(18%) for each as in **Fig.1**

The mean age was (38.1) year & the age range is from (14-69). **Residence:** in our study there were 27 (54%) patients from rural areas & 23(46%) patients from urban areas. **Clinical presentation:** six patients (12%) were asymptomatic, & were incidentally discovered to have hepatic hydatid disease, while 44(88 %) presented with symptoms. Only 2(4%) cases presented as emergency (both as an acute abdomen due to intra-peritoneal ruptured cysts), while the other 48(96%) were managed as elective cases. **The main presenting signs & symptoms** of our patients is shown in (**Fig.2**). It reveals that the most common presenting symptom was abdominal pain in 38(76%) of patients. It was mild intermittent or described as heaviness. Jaundice as a presenting feature was the 2nd in order & occur in 4(8%) followed by abdominal mass in 2(4%) of patients. **The distribution of hydatid cysts in liver segments** is shown in (**Table.1**). It reveals that from the total of 92 cysts located in the liver, most cysts (24 cysts, 26.1%) were located in segment 7, followed by segment 8 (22 cysts, 23.9%), followed by segment 5 (19 cysts, 20.6%). Five cysts (5.4%) in segment 4 & three cysts (3.3%) in segment 1.

Both segments 2 & 3 contain two cysts (2.2%) in each. The total right lobe cysts were 80(87%) & the total left liver cysts were 12 (13%).

The relation of the cysts with the biliary tree as shown in (Fig.3) which reveals the majority (38 patients, 76%) had no cysto-biliary communication while 12(24%) patients presented with cysto-biliary communication (simple & complicated). **The distribution of cysts; hepatic & extra hepatic** is shown in (Table.2) the liver was the single organ involved in 42(84%) patients. Both liver & lung were involved in three (6%) patients. liver & spleen were involved in two (4%) patients, liver & omentum were involved in two(4%) patients. Only one (2%) of patients presented with disseminated intra abdominallydatid cysts.

Medical treatment (antihelmenthics) used in our study in 32(64%) patients in the postoperative period only, while in 15(30%) patients was used in both pre & postoperative periods. Three (6%) patients did not receive medical treatment. **Operations for concomitant hydatid disease of the lung** were done for two (4%) patients. **In our study, 43(86%) of cases** presented for the first time, while 7(14%) of patients presents as recurrent cases. **Scolicidal agents used in our study:** Scolicidal agent was used in most cases (48 patients, 96%), while in two (4%) of patients no scolicidal agent was used. Absolute alcohol was used in 30(60%) of patients, followed by Povidone iodine in 13(26%) of patients. Hypertonic saline was used in 4(8%) of patients & formaldehyde (formalin) used in one patient only. **Methods used for dealing with the residual cavity** are summarized in **Table.3** which reveals that the commonest method used was omentoplasty with or without

intracystic drain in 24(48%) patients. External drainage in 18(36%) & obliteration of the cavity (capitonage) in 8(16%) patients. **Table.4 Summarize the surgical procedures** used for dealing with the hydatid cysts & shows that the commonest method was partial pericystectomy (conservative resection) which was used in 46(92%) patients, followed by total cystopericystectomy in 4(8%) patients. Splenectomy was done for splenic hydatid cysts in 2(4%) patients. **Management of cysto-biliary communications** is summarized in **Fig.4** which shows exploration of common bile duct with T-tube insertion done in 3(6%) patients. Direct suturing of the communicating duct in 2(4%) patients. Missed communications with postoperative bile leak treated conservatively in 6 patients (12%). Preoperative ERCP with sphincterotomy and stenting done for one patient(2%) pre-operatively. **Intraoperative & early postoperative complications** are shown in **Table.5** which reveals that most common intra-operative complications were Anaphylaxis that occur in 2 cases (4%), which was severe & treated by hydrocortisone injections, adrenaline injections, with close observation in the RCU (Respiratory care unit), followed by bleeding due to liver injury which occur in one case (2%), it was significant & require transfusion of (4) units of blood. In early post-operative period, the most common complication was chest infection in 7 patients (14%), followed by bile leak in 6 patients (12%), followed by seroma & wound infection which occur in (3%) & (2%) respectively, followed by subphrenic collection which occur in one patient (2%) & require reoperation & drainage.

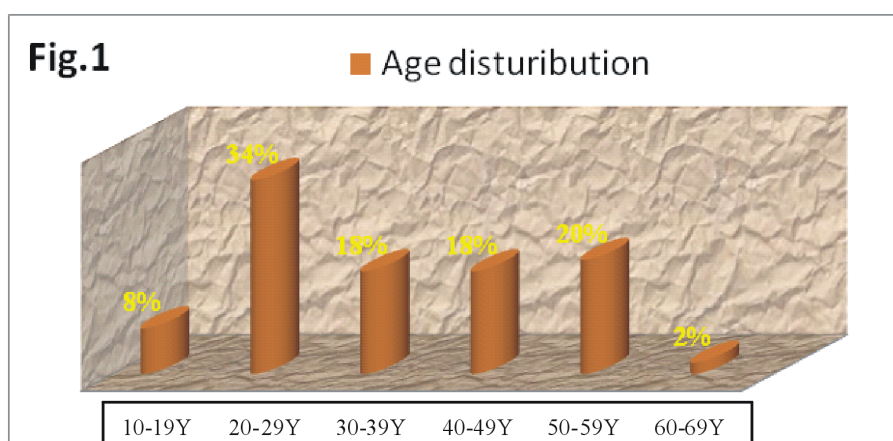


Fig.1

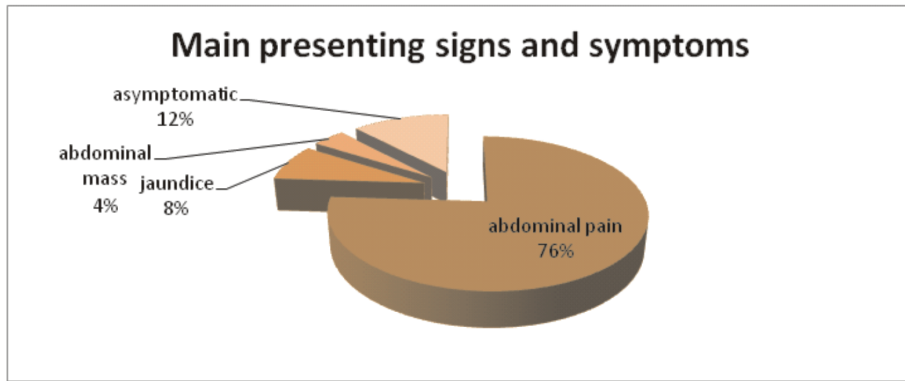


Fig.2

Table.1: Location of cysts in liver segments.

Liver segment	No.	%	
Segment 1	3	3.3%	Left lobe 12(13%)
Segment 2	2	2.2%	
Segment 3	2	2.2%	
Segment 4	5	5.4%	
Segment 5	19	20.6%	Right lobe 80(87%)
Segment 6	15	16.3%	
Segment 7	24	26.1%	
Segment 8	22	23.9%	
Total	92	100%	

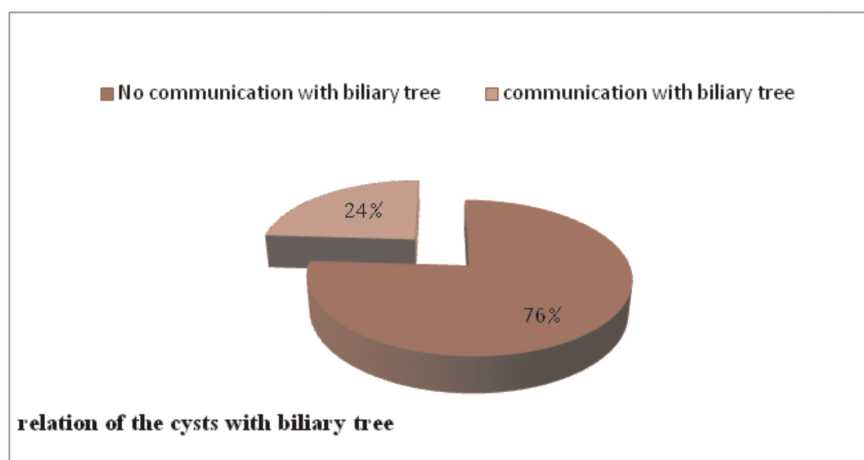


Fig.3

Table.2 : The distribution of cysts; hepatic & extra hepatic.

Site of cyst	No. of patients	%
The liver only.	42	84%
liver & lung	3	6%
Liver & spleen	2	4 %
liver & omentum	2	4%
Liver, spleen, peritoneum, uterus, ovaries & retroperitoneum (diffuse intraperitoneal Hydatid disease)	1	2 %
Total	50	100%

Table.3 : Dealing with the residual cavity.

The method used to deal with the residual cavity.	Number of cysts	%	
Omentoplasty with intracystic drain	11	22%	48%
Omentoplasty only	13	26%	
Excision with external drainage	18	36%	
Obliteration (capitonage)	8	16%	
Total	50	100%	

Table.4 : Surgical procedures used for dealing with cysts.

Method of treatment	No. of patients	%
Partial pericystectomy (drainage & evacuation)	46	92%
Total cystopericystectomy	4	8%
Splenectomy	2	4%
Liver resection	0	0%

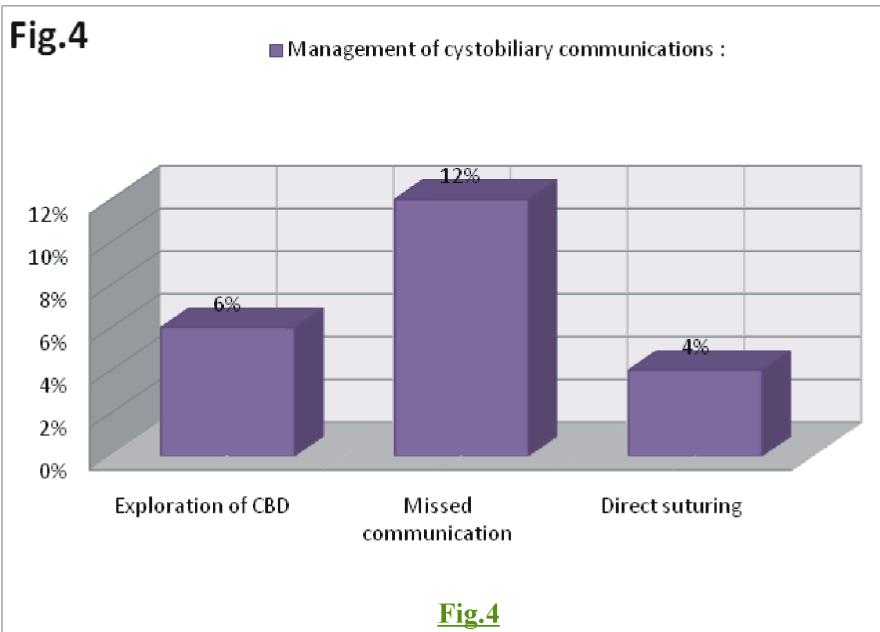


Table.5 : Intraoperative& early postoperative complications.

Complication	No.	%	
Anaphylaxis	2	4%	Intraoperative
Bleeding	1	2%	
Chest infection	7	14%	Early postoperative
Bile leak	6	12%	
Seroma	3	6%	
wound infection	2	4%	
Subphrenic collection	1	2%	

Discussion:

Hydatid disease, or Echinococcosis, is a zoonosis that occurs primarily in sheep-razing areas of the world, but is a worldwide health problem as a result of increased travel & migration²¹. Echinococcosis is endemic in Mediterranean countries, the Middle East, the Far East, South America, Australia, New Zealand, and East Africa. Humans contact the disease from dogs but there is no human-to-human transmission^{22,23}. It is common in IRAQ & most countries of the Middle East⁶.

Age distribution: The highest incidence occurred in ages between 20-50 years²⁴. The mean age in our study was (38.1y) ranges between 14-69 year, this is similar to study by Al-bahrani⁹ (IRAQ-791 cases) which was 39.2 years, Alhurebi²⁵ (YAMEN-97 cases) which was 35.5 years

The main presenting symptoms: The main presenting symptom in our collection was abdominal pain in (76%). This pain was described by our patients as mild pain and some as heaviness. Same results had been mentioned by Mustapha²⁷ (MOROCCO-94 cases) 2001 which was (71.3). The mild symptom is due to the slow growing of hydatid cysts and are even symptomless unless they cause pressure on vital organ or if they rupture spontaneously or because of an injury. Chronic right upper quadrant pain is due to distension of the liver capsule⁷. Other presenting features were cholestatic jaundice (8%) and abdominal mass (4%). Different results had been mentioned in other studies. Palpable mass was present in (24.5%) in study by Mustapha²⁷ (Morocco- 94 case). Cholestatic jaundice was present in 28% in a study by Gonzalez²⁰ (Spain-410 cases). This is explained by the small number of our collection in comparison in those studies. Abdominal pain was severe in those 2 cases who presented as an acute abdomen due to intraperitoneal rupture and in those with intrabiliary rupture with obstructive jaundice. Asymptomatic cases with incidental finding were 12% in our study. Same result was found in Mustapha study from Morocco which was 10%^{27,28}

The relation between hepatic hydatid cyst & the biliary tree: Our results reveal communication with the biliary tree in 24% of cases, which is near to results of Nazar³⁰ (IRAQ-183 cases) 2010 and Kattan²⁹ (Saudi Arabia) which was (18.8) and 25% respectively & it is lower than results of Zeki⁷ (Iraq) which is very high 72.7%. This is probably because cases that need further investigations

(therapeutic and diagnostic ERCP) usually referred to the specialist gastroenterology centers as this type of investigation were available.

The distribution of cysts; hepatic & extra hepatic: the liver acts as the first line of defense, and thus is the most frequently involved organ³¹. In our study the liver involved alone is in 84% of the cases, similar to that of Al-Bahrani⁶ (Iraq) which is 87.6% & more than that of Al - Hadidy²⁶ (SYRIA) 45.6%. Both the liver & lung affected in (6%) of cases which is similar to that of Al Hadidy⁶ (SYRIA) 5.2% & higher than that of Mustapha²⁷ (Morocco) 11.7%, both liver & spleen affected in (6%) of cases which is near to results of other studies^{6,27}, both liver & omentum affected in (4%) of cases which is near to results of other studies^{6,26}. Free intraperitoneal rupture of the hydatid cysts may cause diffuse peritoneal hydatid disease³². In our study there is only one case with diffuse hydatid disease of the abdomen.

Patients presented with recurrent cysts were 7(14%). This is a high number as compared to study of Mustapha²⁷ (morocco) which was 2.12%. This difference may be due to the difference in methods used for treatment & also due to the fact that the already affected patient or the one who has been treated might continue to live in his endemic environment to become reinfested & to develop a new hydatid cyst in the remaining liver parenchyma³³

Scolicidal agent:

Surgical management of hydatid cysts via cyst evacuation resulted in a high rate of peritoneal implantation. This problem prompted the use of scolicidal agents¹³. In our study, the scolicidal agent was used during surgery in 48 patient (96%), this result is near to that of Al-Hadidy (Syria)²⁶ & Al-Bahrani (Iraq)⁶. In our study the most common scolicidal agent used was absolute alcohol which is used in (60%) of patients, followed by povidone iodine which is used in (26%) of patients. The hypertonic saline had been used more in many studies^{38,39} while it was used less frequently in our study because it is not available in our hospital. Hypertonic saline has to be used carefully to avoid biliary injection and hypernatremia. The safety of the other agents in the biliary tree has not been established. No agent should be injected pre-evacuation due to high intracystic pressure¹³.

In our study most of the hepatic hydatid cyst, are dealt with by partial pericystectomy (92%), which is higher than study by Gonzalez (Spain)²⁰ (27.3%) & Mustapha (Morocco) (20.2%)²⁶. This is probably because of good experience and reputation of this procedure among our surgeons & because partial pericystectomy decreases post operative

morbidity & duration of hospital stay²⁷. Liver resection needs surgical training and availability of some instruments e.g. cusa knife, Aragon, etc. Although various surgical methods have their advocates, centers with wide experience, tend to favor the most conservative approach which is partial pericystectomy (evacuation & drainage)⁴.

The residual cavity was dealt with either by Omentoplasty with or without drainage was the most commonly used method in our study (48%), which is similar to results of AKEEL (Iraq) 2004³⁵, but larger than that of Nazar (Iraq-183 cases) 2010 (26.6%)³⁰. This is probably due to its effectiveness in obliteration of the dead space, decrease collection & abscess formation & decrease bile leak⁴⁰. The procedure of evacuation and external drainage of the cavity was used in 36% of cases, which is similar to results of Akeel (Iraq) 2004³⁵. In our study capitonage method was used in (16%), which is near to results of other studies^{30,35}.

In the last 10 years, new methods of treatment of the hydatid cyst have been proposed (percutaneous or laparoscopic). A study from Romania in 2005 published the results of treating 24 cases of hepatic hydatid cyst laparoscopically. Selected cases were managed especially univesicular cysts. They recommend the laparoscopic approach as a standard procedure as it shortens the postoperative hospitalization period, reduces the number of complications as well as the overall costs and facilitates a rapid social reintegration in comparison to the open surgical approach⁴⁰. Another study demonstrates the treatment of fifteen hepatic hydatid cysts in 12 cases by video laparoscopic methods. All the cysts were treated by drainage and omentoplasty with morbidity rate of 8.33%⁴¹.

Recently, the introduction of the PAIR (percutaneous aspiration, injection of scolicalid agent and reaspiration) procedure had improved the treatment options. In a study from India reported the results of ultrasound guided PAIR procedure in 39 hepatic hydatid cysts. Type I & II were managed by the PAIR method while the type III & type IV were managed by percutaneous placement of a Malecot's catheter which was removed after 3-7 days. These new methods were not tried in our hospital during the period of the study⁴².

The exploration CBD & associated procedures: As the cyst grows, bile ducts and blood vessels

stretch and become incorporated within this structure, which explains the biliary and hemorrhagic complications of cyst growth²⁸. Intrabiliary rupture (IBR) is a common and serious complication of hepatic hydatid cyst. The incidence varies from 1% to 25%⁴². Many options of dealing with cysts are practiced including cyst evacuation and omentoplasty followed by either choledochoduodenostomy, T-tube drainage or intracavitary suturing of the orifice, percutaneous drainage of biliary collection or ERCP and sphincteroplasty or nasobiliary drainage⁴³. In our study, CBD obstruction was treated by exploration of CBD in (6%) of patients which is less than study of Zeki (Iraq)⁷ 18.1% & near to that of Gonzalez (Spain)²⁰ 9.1%. In our study there is one case treated by preoperative ERCP & sphincterotomy, which is less than the results of Nazar (Iraq) (5%)³⁰. The low rate of dealing with this complication in this collection is due to the lack of ERCP and interventional imaging experience required to accomplish less invasive procedures.

In our study the most common intra-operative complications were Anaphylaxis that occur in 2 cases (4%), which is near to results of Sally (Iraq) 2006 which was (1.53%)²⁸. In early post-operative period the most common complication was chest infection in 7 patients (14%) which is lower than results by Akeel (Iraq) (23.1%)³⁵. Bile leak in our study was the second most common complication in the early postoperative period which was (12%), which is similar to results of other studies^{30,35}.

Mortality rate: No mortality occurs in our study. This is probably due to good preparation of patients, good surgical skills & good postoperative care. The relatively lower number of patients in our study might be another factor in comparison to other studies^{7,20}.

Conclusion:

- Most of our patients are young with female predominance.
- Liver is the most common organ involved in the peritoneal cavity and most cysts were in segment 7 & segment 8.
- Diagnostic imaging options are progressing with the use of U/S and CT scan for all patients and MRCP when indicated.
- Intrabiliary rupture occurs in 24% of the patients at the time of diagnosis.
- Most surgeons in our hospital use the procedure of Partial pericystectomy (drainage & evacuation) to deal with the cyst & omentoplasty to deal with its cavity with the use of perioperative medical

Treatment.

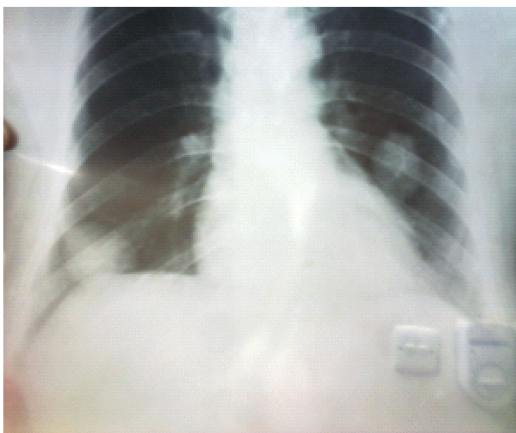
- Recurrent hydatid cyst cases constitute 14% of patients.
- Exploration of CBD was used for those with intrabiliary rupture with obstructive jaundice in 6% of the cases.

Recommendations:

We recommend the availability of ERCP to deal with intrabiliary rupture and obstructive jaundice.

- The practice of minimal invasive surgery in the treatment of hydatid disease such as PEVAC (percutaneous evacuation of the cyst), PAIR & laparoscopic methods.

- The use intraoperative U/S to locate the small cysts that might be missed during surgery.
- Screening of the disease especially in endemic regions and patient's family for earlier detection by portable U/S and serological tests.
- More studies about this disease are necessary in the future for comparison with other studies leading to a better outcome.
- Prevention: Eradication of the disease by prevention is the best treatment.



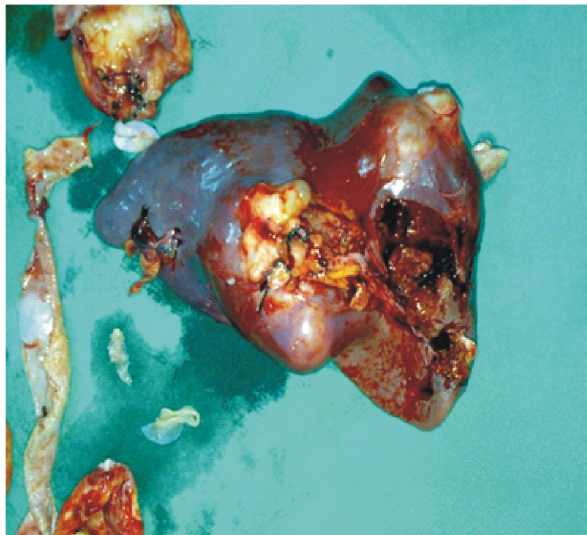
Picture (1): Bilateral hydatid cysts of the Lung



Picture (2): Liver hydatid cyst after drainage & evacuation.



Picture (3): Content of the cyst (Multiple daughter cysts with turbid fluid).



Picture(4): splenic hydatid cysts .



Picture(5): Patient with diffuse intraperitonea lhydatid disease.containing pure pus.



Picture (6): the same patient in picture (5) with infected cyst

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