

External tube drainage versus omentopexy in the management of residual hepatic hydatid cyst cavity

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الخلاصة:-

الهدف من هذه الدراسة
دراستنا لغرض المقارنة بين نتائج استعمال البزل بواسطة انبوب البزل ونتائج استعمال
المساريق في معالجة فجوات الكبد الناتجة بعد استئصال الأكياس المائية منه.

تمهيد:-

الكيس المائي هي كلمة لاتينية تعني (قطرة الماء). العنصر المسبب للاكياس المائية هو
مرحلة الميتاستيسيتود ما بعد يرقة الدودة الشريطية (اكيونوكوكس كرانيلولوسس) المنتشرة عالميا.
بالرغم من تعدد اعراض المرض يجب تشخيصه ومعالجته بصورة مبكرة لان مضاعفات
الاكياس مثل الالتهاب او الانفجار او انسداد القنوات الصفراوية وحالات الصدمة قد تؤدي الى
تهديد الحياة وتؤدي الى الموت.

المرضى والطرق:-

هذه الدراسة اجريت في قسم الجراحة في مستشفى الصدر التعليمي ابتداءً من بداية شهر
كانون الأول لسنة ٢٠٠٨ ولغاية نهاية شهر تشرين الأول لسنة ٢٠٠٩ وتضمنت الدراسة (٧٧)
مريض مصابين باكياس مائية في الكبد تم تقسيمهم إلى مجموعتين استناداً إلى طريقة معالجة
الفجوة الناتجة من إزالة الكيس المائي. المجموعة الأولى (٤٢) مريض عولجوا بواسطة البزل
بالأنبوب بينما المجموعة الثانية (٣٥) مريض عولجوا بواسطة استعمال المساريق.

النتائج:-

في هذه الدراسة وجد ان هناك (٥٣) أنثى و(٢٤) ذكر. متوسط أعمارهم (٣٢ سنة) أعلى
نسبة للإصابة تقع بين (٢٠-٢٩) سنة. ووجد ان نضوح المادة الصفراء بعد اجراء العمليات في
المجموعة الاولى هو أكثر بتسعة اضعاف مما في المجموعة الثانية مما يعطي فائدة حسابية عالية
بين الطريقتين $P\ value = 0.0027$. معدل ايام الرقود في المستشفى كان اطول في المجموعة
الاولى بالمقارنة مع المجموعة الثانية وكذلك بالنسبة للحالات المصحوبة بمضاعفات بالمقارنة مع
الحالات الغير مصحوبة بمضاعفات.

الاستنتاج:-

لا توجد طريقة مفردة للتعامل مع الفجوة المتبقية في الكبد نتيجة ازالة الكيس المائي وكل
حالة لها الطريقة الخاصة للتعامل معها.
نستنتج من هذه الدراسة ان طريقة استعمال المساريق في سد الفجوة الناتجة من إزالة الكيس
المائي في الكبد فيها اقل مضاعفات واقصر فترة رقود في المستشفى وهي الطريقة الافضل في
معالجة حالات اكياس الكبد المائية سواء كانت مصحوبة او غير مصحوبة بمضاعفات.

Abstract

Aim of this study: Our study is confined to the out come of management of the residual cavity of liver hydatid cysts.

Background: Hydatid is a Latin word meaning a drop of water .The causative organism of Hydatid disease is the post-larval metacestode stage of tape worm Echinococcus granulosus has world-wide distribution .Despite the clinical presentation the disease is to be diagnosed and treated at the earliest because the complications of cysts like infection, rupture, biliary obstruction and anaphylaxis may be life-threatening.

Patient and methods: A prospective study conducted at the department of surgery at Al Sader teaching hospital from the first of December 2008 to the end of October 2009 and included

77 patients have liver hydatid cysts divided into two groups. The residual cavity at the first group (42 patients) was managed by tube drainage procedure while the others (35 patients) managed by omentopexy procedure.

Results: There were 53 females and 24 males in this study .The mean age is (32 years). The peak age incidence from (20-29 years) .Post operative bile leakage was found (9) folds more in patients treated with external tube drain than in patients treated with omentopexy gives high statistical significance between them P value =0.0027 The mean hospital stay was longer for external drainage technique in comparison to Omentopexy group and for complicated cases than uncomplicated cases.

Conclusion : There is no single approach to deal with residual cavity of hydatid cysts of liver, and every case should has its individual way of intervention, we conclude that omentopexy has less morbidity, shorter hospital stay and it is the best technique in managing both complicated and uncomplicated hepatic hydatid cysts.

Key words: hydatid cyst, residual cavity, omentoplasty

Introduction

Hydatid is a Latin word meaning a drop of water. It implies a cyst-shaped structure containing water-like fluid. The causative organism of hydatid disease is the post-larval metacestode stage of tape worm Echinococcus granulosus, which has world-wide distribution. Factors like poor hygienic conditions, lack of education and lack of health care contribute to the development of disease. The adult worm lives in the intestine of dogs and other related carnivores (¹). Sheep and cattle are the intermediate hosts for the parasite. Humans happen to be the accidental intermediate host. The most common site where parasites get lodged is the liver. In the liver, the parasite develops into the larval stage - the hydatid cyst, with resultant complications(²). As the hydatid grows slowly, the patient may be completely asymptomatic, even when it reaches a large size. Despite such clinical presentation, the disease is to be diagnosed and treated at the earliest because the complications of cysts like infection, rupture, biliary obstruction and anaphylaxis may be life-threatening(³). Diagnosis is made by a combination of serologic and radiologic investigations supplemented by thorough medical history and examination

Ultrasonography is the most suitable and accurate means of diagnosing hydatid cyst, while computed tomography is invaluable when ultrasonography is equivocal(³). These will typically demonstrate either simple or complex cysts with a cyst wall of varying thickness. The serological test is based on an enzyme-linked immunosorbent assay (ELISA) test for Echinococcal antigens which is positive in over (85 percent) of infected patients. The treatment of early or small hydatid disease involve the use of infected patients of oral anthelmintics such as albendazole (⁴).

There are two basic surgical methods for managing hepatic hydatidosis:

1) Radical methods: this includes total cystopericystectomy and hepatic resection. A total cysto-pericystectomy involves total excision of the intact cyst including the pericyst. Some authors have favored it arguing that the risk of spillage into the peritoneal cavity is low ⁽⁵⁾ and that it leads to more rapid closure of the remaining cavity. However, this method involves major liver resection with increase in operative risk, postoperative bleeding and bile leakage. It should be preserved for peripherally placed cysts, pedunculated cysts and extra hepatic intra abdominal cysts ⁽⁶⁾ and not included in this study. Hepatic resection is indicated if liver parenchyma of one lobe is destroyed or there are multiple cysts in one lobe or a bilobar cyst is found close to the main vascular structures ⁽⁵⁾. However, it is associated with high morbidity and mortality.

2) Conservative surgical method: this involves evacuation of all the contents of the cysts including germinal lining, daughter cysts, hydatid fluid and scolices, leaving the pericyst behind. This is after injection of scolicial agent inside the cavity and followed by irrigation of the cavity with a scolicial agent and management of the residual pericystic cavity. This is the preferred approach for most of the patients ⁽⁴⁾.

Although the radical method has a lower recurrence risk, the conservative method is safer and easier. The most controversial aspect of the conservative method is the management of the residual cavity. Several methods have been put forward for the management of the residual cyst cavity, depending on size, site and number of cysts and preference of the surgeon. These techniques are:

1. Open drainage of cyst cavity into the peritoneal cavity as in case of small, superficial and shallow uninfected cysts.

2. Obliteration of residual cavity as in case of deeply located cysts ⁽⁷⁾ by:

a) Capsulorrhaphy: the cavity is filled with normal saline and the opening of the cavity is closed without any drain.

b) Capitonage: here the dead space is obliterated by a series of purse-string sutures starting from the bottom of the pericyst ⁽⁸⁾

c) Omentopexy: here a flap of omentum is brought to rest within the pericyst cavity with the assumption that omentum will seal small biliary leaks and obliterate the cavity as well.

d) Introflexion: this is a modification of capitonage in which the upper edge of the pericyst is sutured to the deepest part of the cavity with absorbable sutures and then the edge of the pericyst is sutured to collapsed edge by a running suture.

3) External tube drainage: an appropriate diameter tube drain is placed in the cyst cavity and brought out through a separate opening as in case of infected cysts and cysts with biliary communication ⁽⁷⁾

Initially, the residual cyst cavities were dealt with by marsupialization, but unacceptably high rates of complications were reported ^(2, 9) and hence this procedure fell into disregard. Later on, there were reports of successful treatment by enucleation and external tube drainage ⁽⁵⁾, but problems of increased infection and prolonged drainage and fistulae were noted ⁽⁹⁾. Primary obliteration of the cyst cavity using omentum or capitonage has been used successfully and has shown better results ^(2, 10) but this is used in cases of uncomplicated cysts.

Most studies that compare these management techniques do not take into consideration cyst contents and only focus on surgical techniques.

Patients and Methods

A prospective study done on 77 patients with Hydatid cyst of the liver during (11 months) period (from the first of December 2008 to the end of October 2009) treated by surgical intervention in AL Sadder teaching hospital and different private hospitals by different surgeons in AL Najaf city.

All the patients were subjected to a detailed history and physical examination, base line investigations like haemogram, kidney function tests, liver function tests, coagulogram, electrocardiography and X-ray of the chest. Ultrasonography of the abdomen was the main tool for diagnosis of the number, site, size and the type of cysts. Computerized tomography of the abdomen was performed in those cases where results of ultrasonography were equivocal.

After all the investigations were done, patients were taken for surgical theater. A right sub costal approach was used in most of patients. The operative field was carefully protected from hydatid fluid spillage by using packs soaked in cetrimide 1%. The cyst was decompressed by inserting a large-bore angiocath needle and hydatid fluid was aspirated with a syringe after which cetrimide solution was injected into the cavity and left there for five to ten minutes. The quantity of cetrimide used was less than the aspirated volume of hydatid fluid. The pericyst was opened and the cyst contents were evacuated including all the daughter cysts, the laminated membrane and hydatid fluid.

At the end of the procedure, the cavity was examined for any bile duct leakage which, if found, was closed with vicryl suture.(its difficult to find all the sites of bile leakage) The residual cavity was finally managed by either of the two techniques.

- 1) External tube drainage (42 patients): In these patients a 24 to 32 F diameter tube drain, depending on the size of cyst, was placed in the cyst cavity and brought out through a separate skin wound as in picture (1)
- 2) Omentopexy & extracavitary subhepatic tube drain (35 patients): In these patients a viable flap of omentum was brought to rest within the cyst cavity on the assumption that the omentum would help in sealing off small biliary leaks and obliterate the cavity as well as this will dealt with the fluid inside the cavity by lymphatic drainage, picture (2).

The mention procedure were done randomly on the complicated and uncomplicated hepatic hydatid cysts.

Postoperatively, all the patients were put on intravenous fluids and parenteral antibiotics. Oral nutrition was allowed once the bowel sounds re-appeared. The amount and nature of postoperative drainage and the time of removal of drain was noted, all the patients were monitored for complications like cavity infection, bile leaks and its duration. Duration of hospital stay was recorded for each patient. All patients were followed regularly on an outpatient basis, complicated cases were treated conservatively, and no patient needs re-surgery or other intervention.



Picture -1- shows tube drain



Picture -2- shows omentopexy

Results

A total of (77) patients had been operated upon for liver hydatid cyst , there were (53 females) and (24 males) with F\M ratio of (2.2\1), (Figure 1) the mean age was (32 years) ranging from (5-79 years), the bulk of patients number affected was belonged to second, third and fourth decade age groups. The peak age incidence was from (20-29 years) (Figure 2) and (Table-1-).

Most of the patients (>88%) had the disease for the first time in their life, while 8 from (77) had recurrent hydatid cyst disease of the liver (Table -2-).

There were (112) hydatid cysts their sizes ranged from (5-25Cm) in diameter.

The right lobe of the liver was the most commonly involved by the disease constituting (> 85%) of cases. Cysts were unilocular in (50) cases while they were multilocular in (27) cases.

A (53) Patients (70%) had single hydatid cysts of the liver while (24) (30%) of cases had more than one (reaching up to 16) hepatic hydatid cysts (Table -2-).

More than (2/3) (53) of cases had uncomplicated hepatic hydatid cysts, while Infected and/or biliary communication (complicated hydatid cysts) was encountered in (24 patients).

For uncomplicated cysts There was no cavity infection for both types of surgery, while there was no bile leak in omentopexy group, bile leak developed in 3 patients (12%) treated by external tube drainage operation, (Table 3)

Our study showed a higher rate of complications (55%) regarding post operative cavity infection and bile leak in patient already having complicated hydatid cysts preoperatively.

Early post operative cavity infection was three times more in patients treated with external tube drainage procedure in comparison to omentopexy group, whereas bile leak was seen more frequent (9 fold) in patients treated with external tube drainage operation than those treated with omentopexy group (Table 3), giving a high statistical significance between them P-value (0.0027).

Our study show that the duration of bile leak was (10-32) and zero days for patients having uncomplicated hydatid cysts treated by external tube drain & omentopexy respectively, for the complicated cysts bile leak persist (15-45) days post operatively for the external drainage technique group, but it was much shorter time for those who were treated by omentopexy (<15 days) (Table 3).

for All patients with bile leak were treated successfully by conservative measures using Anti biotic and antispasmodics to enhance bile flow through sphincter of Oddi without the needs endoscopic sphincterotomy or reoperation.

Table -1- patient characteristics

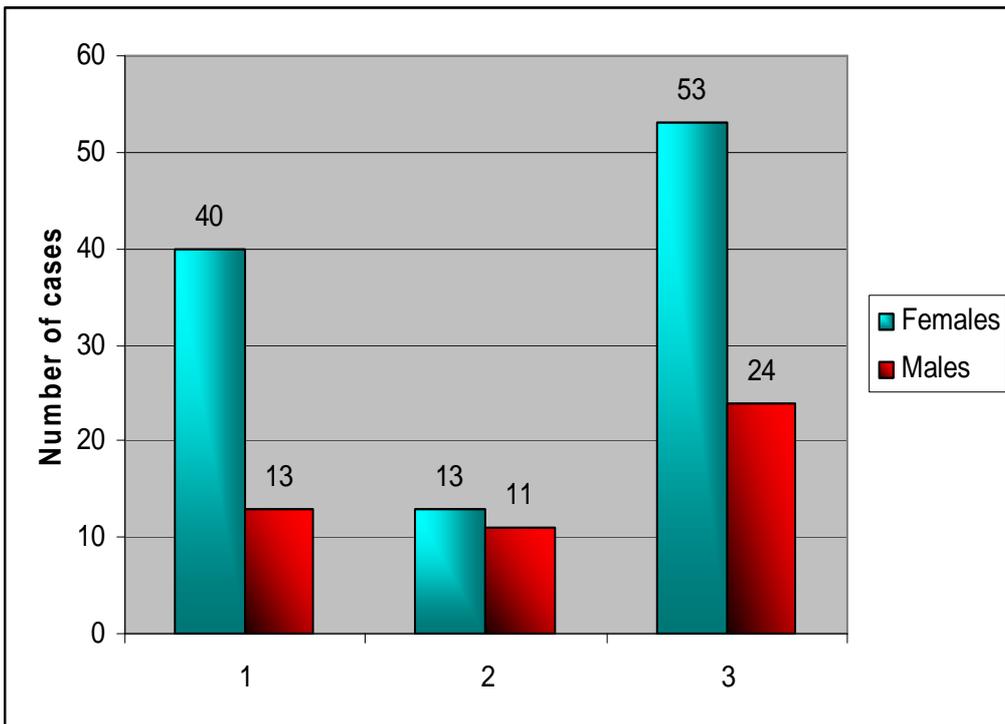
| Cyst cavity and cavity management | No. of patient | Age \years Mean \pm SD | Sex No. female \ male |
|-----------------------------------|----------------|-----------------------------------|--------------------------|
| Uncomplicated | | | |
| Tube drain | 25 | 29.96 \pm 15.41 | 18 \ 7 |
| Omentopexy | 28 | 34.4 \pm 11.85 | 22 \ 6 |
| Total | 53 | 32.26\pm13.73 | 40 \ 13 |
| Complicated | | | |
| Tube drain | 17 | 29.29 \pm 10.88 | 10 \ 7 |
| Omentopexy | 7 | 37 \pm 16.9 | 3 \ 4 |
| Total | 24 | 31.58\pm13.07 | 13 \ 11 |
| All | 77 | 32.05\pm13.4 | 53 \ 24 |

Table -2- liver hydatid Cyst characteristics in 77 patients

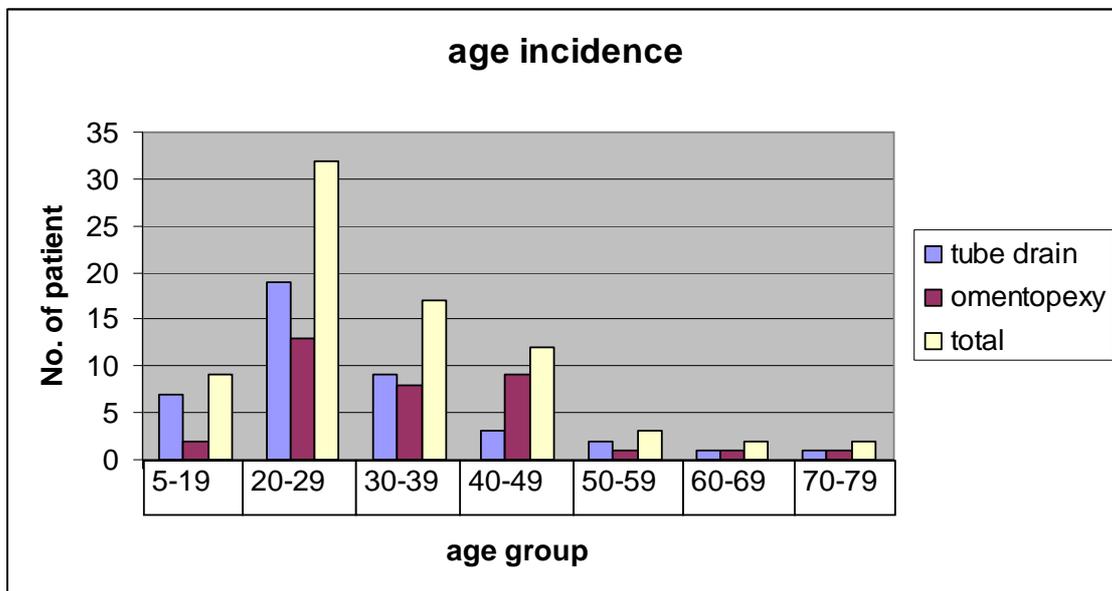
| Cyst content and cavity management | No. of patients with primary\ recurrent | No. of cysts in each lobe Right\left | No. of cysts Single\ multiple | Unilocular\multilocular | Diameter of cysts in cm Mean \pm S.D |
|------------------------------------|---|--------------------------------------|-------------------------------|-------------------------|--|
| Uncomplicated | | | | | |
| Tube drain | 23 \ 2 | 23 \ 4 | 18 \ 7 | 18 \ 7 | 8.82 \pm 2.31 |
| Omentopexy | 26 \ 2 | 24 \ 5 | 21 \ 7 | 20 \ 8 | 7.8 \pm 2.21 |
| Total | 49 \ 4 | 47 \ 9 | 39 \ 14 | 38 \ 15 | 8.33 \pm 2.29 |
| Complicated | | | | | |
| Tube drain | 14 \ 3 | 16 \ 1 | 10 \ 7 | 9 \ 8 | 10.79 \pm 4.4 |
| Omentopexy | 6 \ 1 | 7 \ 0 | 4 \ 3 | 3 \ 4 | 7.42 \pm 2.42 |
| Total | 20 \ 4 | 23 \ 1 | 14 \ 10 | 12 \ 12 | 9.8 \pm 4.2 |
| All | 69 \ 8 88%\12% | 70 \ 10 | 53 \ 24 70%\30 | 50 \ 27 66% \34% | 8.8 \pm 3.07 |

Table -3-postoperative cavity related complication

| Cyst content and cavity management | No. of patient with cavity infection | No. of patient with bile leakage | Duration of leakage \ Days ,.mean \pm SD | Biliary Fistula | Mean stay in hospital In days \pm SD |
|------------------------------------|--------------------------------------|----------------------------------|--|-----------------|--|
| Uncomplicated | | | | | |
| Tube drain | Zero\25 | 3\25 (12%) | 21.5 \pm 11.78 | 2\25 | 4 \pm 2.1 |
| Omentopexy | Zero\28 | Zero\28 | Zero | Zero\28 | 3.51 \pm 1.15 |
| Total | Zero\53 | 3\53 | 21.5 \pm 11.78 | 2\53 | 3.75 \pm 1.66 |
| Complicated | | | | | |
| Tube drain | 3\17 | 9\17 (55%) | 29.87 \pm 17 | 6\17 | 9 \pm 4.1 |
| Omentopexy | 1\7 | 1\7 | 15 \pm 0 | 1\7 | 6.85 \pm 3 |
| Total | 4\24 | 10\24 | 18.0 \pm 15.9 | 7\24 | 8 \pm 3.86 |
| All | 4\77 | 13\77 | 18 \pm 14.2 | 8\77 | 5.87 \pm 2.7 |



(Figure 1) Female to male ratio



(Figure 2) age incidence of patients with liver hydatid systs

Discussion

Hydatid cysts liver seen much earlier in life of our patient (peak age incidence from (20-29years) than what was seen by Cuneyt Kayaalp et al ⁽¹¹⁾ study, which needs more attention to the preventive measure and education of people at risk.

Our study showed higher incidence of hepatic hydatid cyst disease in women than in men (53\24) and this finding is corresponding to Cuneyt Kayaalp et al ⁽¹¹⁾ study.

Recurrent hydatid cyst was lower in our series than Cuneyt Kayaalp et al ⁽¹¹⁾ which was (12%) (24%) respectively. The reverse finding was noticed regarding cysts number between our patients and Cuneyt Kayaalp et al ⁽¹¹⁾ giving (70%) and (84%) of cases having single cyst respectively. Interestingly most of our patient had unilocular (66% of cases) hydatid cysts which was double their series (30% of cases) this mean that our patient present or diagnosed at early stage of the disease (single cyst mean early disease).

Bile leak was seen in (29%) of our cases (3 uncomplicated cases and 9 complicated cases) whose treated by external tube drainage surgery with much high incidence in complicated cases giving rise to (53% of cases) these finding were corresponding to Cuneyt Kayaalp et al⁽¹¹⁾ who report (24.4%) and (61%) respectively, the same finding had been seen regarding the bile leak in external tube drainage group in relation to omentopexy group seen (29% ,3%) for both group respectively ,which means that omentopexy is safer and has lower morbidity and hospital stay than external tube drainage procedure.

An eight out of 77 of our patient (16%) had prolonged biliary leakage (fistula) (>10 days) their amount were ranged between (200-700 cc\day), all of them were closed without endoscopic or surgical intervention which was reported by M. L. Vignote et al⁽¹²⁾

Biliary fistula was more in external drainage group (19%) than the (2%) of the omentopexy group; (only one case had bile leakage for 15 days) this finding was corresponding to Cuneyt Kayaalp et al ⁽¹¹⁾

and slightly higher than Shaleen Agarwal et al ⁽¹³⁾ who reports (13%) incidence post operative biliary fistula complication. the same finding had been seen by Papadimitriou J and Mandrakes ⁽⁹⁾ who conducted a study involving 227 patients with hydatid cysts of the liver. They observed that marsupialization or external tube drainage of the cyst was associated with high incidence of complications like bilious leakage and prolonged hospitalization. On the other hand, omentopexy had fewer complications and shorter hospital stay. This is in agreement with our results. Lotfi and Hashemian ⁽¹⁰⁾ performed omentopexy in (12 patients) and observed that average hospital stay in these patients was (10 days) and following discharge there was no drainage or biliary fistula. Iskender Sayek et al. ⁽¹⁴⁾ reported good results in patients who underwent omentopexy as compared to patients managed with external tube drainage. Similar results were seen in the study conducted by Elhamel and Murthy ⁽¹⁵⁾ involving 50 patients of hydatid liver cysts. Dawson et al. ⁽¹⁶⁾ conducted a study involving 48 patients and concluded that omentopexy is the best technique as it is associated with shorter hospital stay and lower incidence of biliary fistula.

There was no cavity infection in all of our patient with uncomplicated hepatic hydatid cysts which is in contrast to Cuneyt Kayaalp et al ⁽¹¹⁾ finding who stated (5%) postoperative cavity infection rate in uncomplicated cases, their finding is very high in complicated cysts reaching to (35%) of cases ,while the post operative cavity infection rate in our complicated cysts is only (16.7%) which reflect that we dealt properly with

cyst contents in our series with enough time of scolicial antiseptic application and the use of proper antibiotic cover (third generation cephalosporin+metronidazol). Langer⁽⁵⁾ observed in his study that obliteration of the cavity by omentopexy offered little advantage as infection was quite common, this observation is not in agreement with our results. For cysts communicating with the biliary tract, he proposed that an attempt should be made to directly close the fistula with fine sutures, followed by external tube drainage, we agree about trying the best to deal with biliary communication by direct closure in both techniques.

In contrary to Cuneyt Kayaalp et al⁽¹¹⁾ series who registered a (50%) & (71%) post operative cavity complication in Omentopexy and external drainage groups respectively, we have (35.7%) complication rate in external drainage technique and only (6%) in Omentopexy group.

In contrast to Cuneyt Kayaalp et al⁽¹¹⁾ who registered (1.5%) mortality rate we have no death due to cavity or intra abdominal sepsis.

Duration of biliary leakage and fistula was from (10-32 days) for uncomplicated cysts, while it was from (15-45days) for complicated cysts which is much less than Balik AA et al & Vagioanos C, Androulakis JA. studies⁽¹⁷⁻¹⁸⁾ that reports (1-4 months) duration for spontaneous closure.

The mean hospital stay was longer for external drainage technique in comparison to omentopexy group and for complicated cases than uncomplicated cases Giving (4 , 3 & 9,6 days) respectively, this finding is comparable to Pitt HA et al, Langer B & Cuneyt Kayaalp et al^(2,5,11) who stated that uncomplicated cysts have short hospital stay with each cavity management technique than complicated cysts.

Conclusion

There is no single approach to deal with Hydatid cysts of liver, and every case should has its individual way of intervention, we conclude that omentopexy has less morbidity, shorter hospital stay and it is the best technique in managing both complicated & uncomplicated accessible hepatic Hydatid cysts.

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