



ORIGINAL RESEARCH PAPER

Surgery

COMPARATIVE STUDY OF EXTERNAL TUBE DRAINAGE AND OMENTOPLASTY IN THE MANAGEMENT OF RESIDUAL CAVITY OF HEPATIC HYDATID CYST

KEY WORDS:

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ABSTRACT

INTRODUCTION- Hydatid disease of the liver has been known since ancient times. Hydatid disease occurs more frequently in the liver (50-70% of the cases). Surgery remains the gold standard treatment for hydatid liver disease. The aim of surgical intervention is to inactivate the parasite, to evacuate the cyst along with resection of the germinal layer, to prevent peritoneal spillage of scolices and to obliterate the residual cavity. The obliteration of the cyst cavity after evacuation is a controversial procedure in hepatic hydatid disease.

AIMS AND OBJECTIVE: To compare the surgical outcome and various complications of omentoplasty and external tube drainage in the management of residual cavity of liver hydatid cyst.

MATERIAL AND METHOD- This study was carried out on 30 patients with hydatid liver disease. The diagnosis was based on full clinical history and examination, radiological imaging (abdominal USG/C.T). Patients were randomly classified into 2 groups, each of them has 15 patients. Group A was subjected omentoplasty in which omentum pedicled kept in cavity, while group B external tube drainage in which drainage tube kept in cavity.

RESULT- hydatid liver disease occur in all age group, most commonly seen in low socioeconomic group. Higher chance of post operative complication, prolong stay, delay in joining of day to day activity in ETD as compared to OP group.

CONCLUSION- omentoplasty techniques had fewer complications than external tube drainage, with a shorter hospital stay. It can also produce satisfactory results in treating residual cavity of the hepatic hydatid cyst.

INTRODUCTION-

Echinococcosis is a disease that has been documented by humans for centuries. There has been mention of it in the Talmud. It was also documented by ancient scholars such as Hippocrates, Aretaeus, Galen and Rhazes. It was known to Hippocrates who speaks of 'liver full of water' Although echinococcosis has been well known for the past two thousand years, it wasn't until the past couple of hundred years that real development was made in determining and describing its parasitic origin. The name echinococcus was first introduced by Rudolphi in the period between 1801 and 1808¹. The earliest report in the medical literature of hydatid cyst in man was that of Bremses in 1821². During the 1850s, Carl von Siebold showed through a sequence of experiments that Echinococcus cysts do cause adult tapeworms in dogs. Naunyn³ in Berlin, Krabbie⁴ in Iceland and Thomas⁵ in Australia alone defined man's position in the parasite's life cycle as being identical to that of sheep, by feeding larvae derived from human sources to dogs and recovering mature worms in this animal's intestine. George employed the use of Trocar and Canula in the treatment of hydatid disease. In 1911 Casoni, introduced an immediate hypersensitivity skin test for diagnosis of hydatid disease⁶. There are many ways of dealing with the residual cavity, depending on its size and site. Simple cyst closure, omentoplasty, capitonnage, marsupialization, drainage, Roux-en-Y cystojejunostomy are the most important options. In that Proponents of ETD claim that it is technically easier to perform, takes lesser time and identifies biliary leaks. Proponents of OP claim its superiority owing to the facts that it results in decreased postoperative stay, complications and is associated with lesser rate of recurrence and residual infection.^{6,7,8,9,10}

MATERIAL AND METHOD

This study was conducted in our hospital from September 2013 to September 2015.

STUDY DESIGN: - Prospective, Observational, Cross-sectional study

INCLUSION CRITERIA:-

Admitted cases of diagnosed hydatid cyst of liver and subjected to surgery.

Ultrasonography (USG) and/or Contrast Enhanced Computerized Tomography (CECT) documented hydatid cysts of the liver.

EXCLUSION CRITERIA:-

Patients with Gharbi Type V hydatid cysts (dead cysts that appear calcified on ultrasonography).

Infected hydatid cysts.

Small cyst (4ml) and deep in liver parenchyma

Patient is not willing for surgery or managed without surgery.

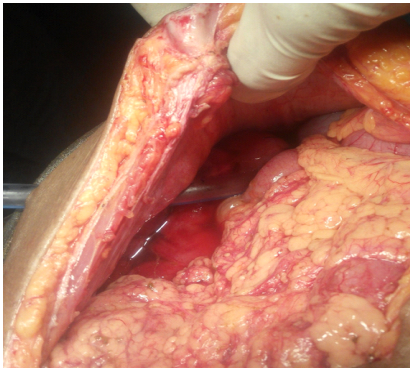
Patient underwent imaging by USG and/or CECT abdomen and pelvis. Chest X-ray was done for all patients to rule out associated lung hydatid cyst. They were subjected to various blood investigations including LFT. Tab albendazole 15 mg/kg/day was given preoperatively and continued postoperatively. Patients were explained in detail about the procedure and an informed consent was taken for the same. Patient underwent standard open hydatid cystectomy by appropriate incision. Scolicidal agent like savlon (1-3% cetrimide and chlorhexidine gluconate solution) or 3% hypertonic saline was injected in the cyst cavity. 5-10 ml of cystic fluid was aspirated and an equal amount savlon was injected and was left in place for 5 minutes. Spillage was prevented intra operatively by mops soaked in scoliceidal agents (savlon or hypertonic saline).

To prevent anaphylaxis patients were given injection hydrocortisone 100 mg IV before opening of cyst cavity and continued postoperatively for three days at the same dose.

Cyst contents were evacuated and cavity thoroughly washed with savlon and 3% hypertonic saline. Deroofing of cyst wall was done. The cavity was thoroughly inspected for any communication with biliary system and if present it was closed with 2-0 polyglactin. For the management of residual cavity of hepatic hydatid cyst, patients were randomly allocated into two groups.

Group 1- Included external tube drainage (ETD) by abdominal drain no.28 or 32FG which was placed in the cavity and

exteriorized by separate skin incision.(image 1)



Group 2- Included omentoplasty (OP) done by fixing live omental pedicle to cyst wall using 2-0 polyglactin. A no.28 FG tube drain was then placed in the Morrison's pouch in both group and exteriorize by separate skin incision.(image 2)



Both groups included 15 patients.

Various surgical outcomes and complications of both procedures like bile leak, wound and respiration tract infection, hospital stay etc were evaluated.

Post operatively patients were given antibiotics like ceftriaxone 1gm 12 hourly, metronidazole 500mg 8 hourly and amikacin 500 mg 12 hourly.

Drain was removed only when quantity was less than 25 ml in 24 hours. Post operative pain was measured by using VAS. It is a simple assessment tool consisting of a 10 cm line with 0 at one end, representing no pain, and 10 on the other, representing the worst pain ever experienced.

The clinician thus assesses the patient's postoperative pain. Pain score was done on post operative day 1, 2, 3 and if score was more than 5 appropriate analgesics were given. Wound was inspected for any soakage or signs of infection on post operative day 3.

If any patient showed features of sepsis, it was evaluated by complete septic profile and USG was done to rule out any intra-abdominal abscess. All patients were discharged on Tab albendazole 400mg once daily for 21 days. Repeat cycle of albendazole was initiated after a gap of 7 days after checking patient's blood count. All patients were followed in the outpatient department and the time taken for return to routine work was noted too. Patients were followed up every 1st, 3rd, and 6th month by USG to see residual cavity. CECT was done if needed.

To calculate the p-value, "Fisher's exact test", "chi square" and "unpaired t-test" was applied.

RESULT

12 of the 30 patients were laborers, which makes up the largest group (40.00%) followed by farmer which included 10 (33.37%) patients. P value was >0.05 so observed difference is statistically

not significant. This hospital caters patients for rural area. and History of contact with sheep or dogs was present in 23 (76.67%) patients and absent in 7 (23.33%) patients. P value was >0.05 so observed difference is statistically not significant.

Abdominal pain was the commonest mode of presentation 22 (73.34%) Followed by abdominal lump 14 (46.66%). Fever was the presenting feature in 9 patients (30.00%).It was mostly due to URTI; UTI and non-specific GI infection which was treated with appropriate antibiotics.1 patient (3.33%) had jaundice as chief complaint. P value was >0.05, so observed difference is statistically not significant.

The hydatid cyst was present in the right lobe of liver in 25 (83.33%) cases, only in 5 cases cysts were in the left lobe (16.67%). P value was >0.05 so observed difference is statistically not significant.

Table 1: Post-operative Complications (n-30)

Complication	ETD Present study % (N=15)	OP Present study % (N=15)
Pulmonary infection	4(26.67)	2(13.33)
Bile leak	5(33.33)	-
Superficial Wound infection	3(20)	1(6.67)
Residual cavity infection	2(13.34)	-

5(33.33%) patient of ETD show bile leak, where OP group does not show any of the residual cavity infection or bile leak .4 patient of bile leak manage conservatively were one patients treated with ERCP and stenting. with Pulmonary infection was frequently seen in ETD group (26.67%) as Compared to OP group (13.34%) which was treated with chest physiotherapy and antibiotic.Wound infection which was a superficial infection seen in 3(20%) of ETD and 1(6.67%) in OP group which was treated with alternate day dressing and antibiotics. Residual cavity infection occurred in 2(13.34%) patients in ETD group whereas OP group did not show any incidence of it.

Patients with post operative residual cavity infection showed thin pus draining from the tube but no evidence of any collection on USG.

Pain in postoperative also measured by visual analog scale score system which was measured at day 1,2,3 .which show significantly more pain in ETD group as compared to OP group . Pain on 1st postoperative day was 6.4± 0.82in ETD group and in OP group is 5.6±0.91. On the second postoperative day, the mean pain scores observed. Were 4.8±0.99 ETD group and 3.2±0.56 in the OP group. On the third postoperative day, the mean pain scores were 3.4±0.73 in ETD group and OP group 1.8± 0.74 group. P value is <0.05 so observed is difference statically significant.In 14 (93.33%) patients drain was removed within 5 days in OP group. Whereas in ETD 9(60%) patients had removed drain within 5 days. The drains were removed at a mean duration of 4.73±2.1 days in OP group and 5.2± 1.6 days in ETD group.In 14(93.33%) patients of omentoplasty drain was removed within 5 days, whereas in ETD group 7(46.67%) patients had their drain removed between 6-10 days. Out of the remaining 8(53.33%) patients of the ETD group 3(20%) patients had drain removed beyond 20 days. And mean day at which drain was removed is 16.2±13.7day. 9(60%) patients in the ETD group had cyst volume up to 500ml.3(20%) patients had volume more than 1000 ml but up to 1500 ml. Single(6.67%) patient had cyst volume more than 1500 ml.13 (86.67%)patients in the OP group had cyst volume up to 500 ml. No patient in this group had cyst volume beyond 1500 ml. Whenever feasible omentoplasty should be preferred over external tube drainage in the surgical management residual cavity.

6 (40%) patients of ETD group had hospital stay between 11-20 days whereas 4(26.67%) patients stayed for more than 20 days. where in OP group 12 (80%) patients had hospital stay between 1-10 days.Mean duration of hospital stay in ETD group 18.53 ±12.83 days and in OP group 9.8± 3.2 dayIn ETD group, 5 patients

(33.33%) each returned to routine work upto 10 days, 11-20 days and beyond 20 days. In OP group 13 patients (86.67%) returned to routine work by 10 days. Mean duration of joining day to day activity is early in OP group 9.8 ± 3.3 as compared to ETD group days 15.4 ± 6.9 .

During follow-up patient underwent USG at intervals of 1 month, 3 month and 6 months. All patient of ETD group show collapsed cavity were OP group patients show obliteration of cavity. One (6.67%) patient of ETD group showed recurrence at the end of 6th month, whereas no recurrence was noted in OP group.

DISCUSSION

In recent years, liver hydatid has been documented as a public health problem of worldwide dimensions and has been attributed to occupational or domestic exposure (rearing of sheep/pets, consumption of contaminated vegetables). Foci have been recognized from India where the highest prevalence has been reported from Tamil Nadu and Andhra Pradesh¹¹. In general, hepatic hydatid cysts are single, uncomplicated, and situated in the right lobe of the liver.

Surgery still remains the definitive tool in the treatment of hepatic hydatid disease. The main issue is the management of residual cavity of hepatic hydatid cyst, which is efficiently dealt with by various surgical procedures.

The youngest case in our study was 19 years while the oldest, 70 years. The commonest age group was 31-40 years (33.33%). Our data was comparable to Weatherston et al¹² having commonest age group of 31-40yrs (41.30%). The second commonest age group in our study was 41-50 yrs (26.67%) Studies by R.B.Mehta et al¹⁶ and J.Akther et al¹⁴ had maximum representation of age group 21-30yrs (27.1% and 26.49% respectively).

Weatherston et al¹², R.B. Mehta et al¹² and J.Akther et al¹⁴ have also concluded that hydatid disease distribution is seen all age group but it is less likely to be seen in younger population due to its slow growth.

Our study had a female predominance with 60% females and 40% males. This is similar to observations by Ahmed A. et al¹⁵ (65.5% females, 34.9% male), Weatherston et al¹² (63% females, 37% males) and Avgerinos et al¹⁶ (66% females, 34% males).

On the other hand R.B. Mehta et al^{13,2} had slight male predominance (56.3% males, 43.7% females). Thus there exists a wide variation in the sex distribution in various series, probably because of differences in lifestyle and ecological factors of different geographic areas.

Female predominance in our study could possibly be explained by their involvement in agricultural and cattle rearing activities in the geographic area of our study. Most of our patients were from low socio-economic class which included agriculturists, labourers etc. Labourers were most commonly involved (40%) followed by farmers (33.37%). The findings are similar to Faheem et al¹⁷ (Labourers- 26.67%, Farmers-27.96%, House wives-29.64%), Tiemin Zhang et al¹⁸ (Labourers-15.08%, Farmers- 45.36%) and Alsiagy et al¹⁹ (Labourers- 3.67%, Farmers- 42.2%, House wives-31.1).

Thus occupation involving exposure to animals, poor personal hygiene and low socio-economic class are common high risk factors.

In our study, history of contact with dogs or sheep was present in 76.67% patients. R.N. Sibal et al¹⁹ study (43 cases) had 32.6% patients with similar history whereas S.K. Bhobhate et al²⁰ study had 49.4%. This shows that history of contact with animals is very significant, making it a risk factor which plays a major role in etiopathogenesis of the disease. Poor personal hygiene, usage of unwashed vegetables, unwashed hands, and low socioeconomic status adds to the risk in those people who does not have history of contact with animals.

Mild pain controlled by oral analgesics is the most common clinical presentation. Pain is caused by stretching of the sensitive membrane covering the liver. Patients presenting with mass per abdomen could be due to the fact that most took over the counter analgesics and never consulted their doctors due to ignorance or low financial status. Only one patient presented with jaundice due to infected hydatid cyst compressing the CBD.

The commonest clinical picture in our study was abdominal pain (77.33%) followed by lump (46.66%). It was comparable to study by Ahmed A. et al¹⁵ having 74% patients with abdominal pain and 55% with lump. R.V.S. Yadav et al²¹ study showed lump in abdomen (85.7%) to be the most common symptom followed by pain in abdomen (61.4%).

In our study right lobe of liver was involved in 83.33% cases and left lobe in 16.67% cases. This is in accordance with study by Elfeky et al²² (87.5% - right lobe, 8.3% - left lobe), Ahmed A. et al¹⁵ (78% - right lobe, 13% - left lobe), and Weatherston¹² et al (79% - right lobe, 21% - left lobe). The more common involvement of right lobe of liver could be explained on the basis of following: Blood supply to the right lobe of liver is greater and right lobe is bulkier as compared to left.

Our study group 1 (ETD group) had a 33.33% incidence of bile leak as was noted by Xynos et al²³ (31.57%) and S. Sozen et al²⁴ (25%). Pulmonary infection in this group was 26.67% in our study whereas studies by Wani et al⁵⁴ and Xynos et al had an incidence of 10.71% and 10.52% respectively. Wound infection was 20% in this group and it was comparable to Xynos et al⁵⁶ study at 12.28%. Residual cavity infection of our study (13.34%) was comparable to studies by S. Sozen et al²⁴ (12.5%). Our study group 2 (OP group) had 13% incidence of pulmonary infection which was comparable to study done by Xynos et al²³ (12.63%). Wound infection of 6.67% was comparable to Wani et al²⁵ study (7.14%) and S. sozen et al²⁴ study (7.14%). Bile leak and residual cavity infection were absent in our study.

Post operative biliary leak was absent in patients treated with omentoplasty. It may be because of exceptional absorption and sealing property of omentum decreasing the chances of post operative biliary leak. Because of this property of absorption of fluid as well as particulate matter, it is called as biological blotter.

Omentoplasty is thought to assist in healing of raw surface, promoting resorption of serosal fluid and bringing macrophages to septic foci. Omentum is well known as 'policeman' of the abdomen. It can passively move to a site of intra-abdominal inflammation, where it becomes adherent.

Omentum can also seal off any leaks from viscus. Out of 15 patients treated with external tube drainage, 5(33.33) patients had post operative biliary leak. Out of 5 patients with biliary leak one patient underwent ERCP with stenting whereas in rest leak stopped with conservative management.

Post operative pulmonary infection was commonly seen in ETD (26.67%) group as compared to OP (13.33%) group. It was treated with chest physiotherapy and appropriate antibiotics. Restriction of activity was found to be an important risk factor for development of pulmonary infection and preoperative URTI infection exacerbates it post operatively.

Superficial wound infection was higher in cases of external tube drainage (20%) as compared to those with omentoplasty (6.67%). Tube may introduce infection inside the body from external environment. It was treated with sensitive antibiotics and alternate day dressing.

In the present study, residual cavity infection (13.33%) was higher in external tube drainage than omentoplasty (0%). Patients with post operative residual cavity infection showed thin pus draining from the tube. USG did not reveal any collection (pus) in residual cavity. Conservative management was confined to such cases.

Ascending infection can be introduced from gut and external tube.

Some tube may not drain the cavity adequately due to complete or partial blockage or due to non-dependent positions. Omentoplasty had the least incidence of fever. Omentoplasty because of its action as biological blotter gives adequate internal drainage and may help in fighting the infection leading to decrease incidence of post operative fever.

Mean of post operative complications was higher in ETD (23.33%) as compared to OP (5%) group. This is comparable to Elfeky et al²² study in which mean complication rate in ETD group was 16.67% and in OP group, 8.32%. This is because the persistent cysto-biliary fistula takes time to close spontaneously and ascending infection from gut can lead to residual cavity infection.

In our study, the mean pain visual analog score was higher in all patients on day 1(6.4), day 2(4.8) and day 3(3.5) of ETD group as compared to OP group day 1,(5.6), day 2(3.2) and day 3(1.8). Wani et al²⁵ also stated comparable findings that ETD [day 1(5.6), day 2(4.8), day 3(1.8)] is more painful as compared to OP [day 1(5.1), day 2(3.8), day 3(2.8)].

The main causes of postoperative pain are the stretching of wound all through the surgery and the total length of incision. The presence of another tube through the abdominal cavity acts as a constant source of stretching and consequently results in pain. Thus it is not surprising to find out that the pain scores in ETD group were significantly higher as compared to the OP group.

The drains were removed in Morrison's pouch at a mean duration of 5.2 days in ETD group and 4.7 days in OP group. Which is comparable to study by Wani et al²⁵(ETD-8.1 days and OP-5.1 days) and Bilge et al²⁶(ETD-9.2 days and OP-7.8 days) Bilge et al²⁶ also showed removal of Morrison pouch drain is earlier in OP group as compared to ETD group.

Higher hospital stay was associated with external tube drainage at 18.53 days in comparison to OP group at 9.8 days. Elfeky et al²² (ETD-14.3 days and OP-6.6days) and Dhananjay et al²⁷ (ETD-18.5 days and OP-9.6days) also state that patient's hospital stay is prolonged in ETD group as compared to OP.

Time taken for spontaneous closure of cysto-biliary fistula, ascending infection from gut and external tube leading to cholangitis, increases the hospital stay.

Mean duration of resuming daily routine activity was earlier (9.8 days) in OP group as compared to ETD (15.4 days). Less postoperative pain and absence of an additional tube drain translated into early ambulation and earlier discharge in OP group. This was also reflected in the earlier resumption of activities of daily life by this group of patients.

Another factor contributing to early discharge in this group was the absence of bile leak and consequent earlier removal of the tube drain. Similar results were reflected in study done by Wani et al²⁵ (ETD-19.42 and OP-13.34 days).

Only one (6.67%) patient in ETD group at 6 months follow up had recurrence. No recurrence was noted in OP group. This fact is supported by Wani et al²⁵(10.714) study which also showed a high recurrence in ETD as compared to OP.

CONCLUSION

Our study included management of residual cavity in 30 cases of hydatid liver disease.

The disease was seen in all age groups; more frequently in elderly and middle age group with female predominance. Low socioeconomic status and occupation involving contact with animals were risk factors for the disease. Absence of history of contact with pets doesn't rule out the possibility of disease. Liver is most commonly involved organ. Right lobe is more commonly involved. Abdominal pain was the most common presenting feature in liver hydatid following lump in abdomen.

Diagnostic modalities for abdominal hydatid were USG abdomen and CT scan. Residual cavity of hepatic hydatid cyst was treated with external tube drainage and omentoplasty. Infection and biliary leak were common complications seen post operatively and its incidence was higher in external tube drainage group. Hospital stay was less in omentoplasty group. One (6.67%) recurrence was observed during the follow up of patients in ETD group. No recurrence was seen in OP group.

Our results support that omentoplasty techniques have fewer complications than external tube drainage, with a shorter hospital stay. It can also produce satisfactory results in treating residual cavity of the hepatic hydatid cyst.

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