

Original paper

Laparoscopic Management of Hepatic Hydatid Cysts in Kerbala

Abdulrazzak Kalaf Hassan

Department of surgery/College of medicine/ University of Kerbala/ Kerbala/ Iraq

Abstract

Background: Hydatid disease is a common problem in Iraq and Surgery is the mainstay of treatment. This is a prospective study of those patients with liver Hydatid cyst who were managed surgically at Al-Hussain Medical City in Kerbala for a period of one and half year from January 2013 to June 2014.

Aim of the study: The aim of this study was to discuss the clinical presentations, diagnoses, and laparoscopic surgical treatment of liver hydatid cysts in comparison with other studies.

Methods: forty patients were enrolled in the study, data collected: preoperative assessment, type of treatment and postoperative follow-up until their discharge from our hospital.

The diagnosis was based on clinical examination, plain X-Ray, U/S & CT scan, MRI and MRCP.

Results and discussion: hydatid cyst forms the commonest space occupying lesion in the liver. The recurrent form of the disease was found in 12 patients (30%) and the multiple liver hydatid found in 16 patients (40%). This relatively high incidence of recurrence and multiplicity of the disease indicate high prevalence of such pathology in our areas.

24 patients (60%) operated laparoscopically and 16 patients (40%) were operated by traditional opened method.

The surgical treatment of hydatid cyst were in form of: Excision and external drainage in 32 patients (80%), excision and omentoplasty in 8 patients (20%).

Post-operative complications included: Wound infection in 5 patients (12.5%), respiratory tract infection in 4 patients (10%), urinary tract infection in 3 patients (7.5%), persistent drainage through the tube drain in 3 patients (7.5%), abscess collection in the residual cavity in 2 patients (5%) and persistent obstruction of the common bile duct in 1 patient (2.5%).

Overall morbidity was 45% of our patients. No mortality was recorded.

Conclusions: laparoscopic treatment of the hepatic hydatid cyst is a new method with great advantages and minimal disadvantage and we highly recommend to assess any patient for laparoscopic treatment.

Keyword: Laparoscope, hepatic hydatid cyst, Echinococcus.

Introduction

The liver is the largest organ in the body. It constitutes one-fiftieth (1/50) of total body weight (1.5 Kg in average adult)⁽¹⁾. Receives dual blood supply from hepatic artery & portal vein. It acts as metabolic, biochemical & microbiological filter⁽²⁾. The diseases that affect the liver are of different pathologies (infective, inflammatory, neoplastic, congenital, metabolic, traumatic, etc). Of the benign conditions that are common in our country is the

hydatid disease. This disease is caused by the larval stage of Echinococcus granulosa. The normal habitant of the mature stage E. granulosa is the small intestine of the dog. The sheep is the usual intermediate host harboring the cystic larval form of this-tapeworm. Human is the accidental intermediate host⁽³⁾. The highest incidence of hydatid disease thus occurs in the great sheep breeding countries e.g. Greece, Australia, Newzeland, South America, Turkey, Iran & Iraq. In our country the disease is

*For Correspondence: E-Mail abdulrazzak2006@yahoo.com

endemic mainly in central & southern Zones⁽⁴⁾.

The danger of infestation is greatest in childhood when intimate contact between children & dogs is likely, ova from infected dog feces are swallowed & hatch into motile hexacanth embryos which penetrate the mucosa of the small intestine to enter the portal vein radicals. They find lodgment in the liver which is the primary filter⁽⁴⁾. About 75% of all hydatid cysts in humans are found in the liver & 15% in the lung (the second filter)⁽¹⁾.

Hydatid cyst is remained a significant cause for mortality and morbidity in spite of recent advances in diagnostic and therapeutic means .

Surgery remains the mainstay of treatment for hepatic echinococcosis. Several nonsurgical options have been explored like percutaneous approach of aspiration, injection and reaspiration (PAIR) has been advocated by WHO in selected cases. Percutaneous evacuation of cyst content (PEVAC) using a large bore catheter⁽⁵⁾. Drug therapy in the form of oral albendazole is given for specific conditions in liver hydatid: 1- Widely disseminated hydatid disease. 2- Localized disease in poor surgical risk patients. 3- Ruptured cysts. 4- Patients in whom significant intraoperative spillage.⁽⁶⁾

The first report of laparoscopic treatment of hydatid cyst of the liver was published in 1994^(7,8) However, gradually reports started appearing in the world literature detailing laparoscopic management of liver hydatid disease^(9,10). The indications, contraindications, advantages, and disadvantages of this technique have been elucidated⁽¹¹⁾.

Aim of The Study

To discuss the clinical presentations, diagnoses, and laparoscopic surgical treatment of liver hydatid cysts in comparison with other studies .

Patients & Methods

This is a prospective study on 40 patients admitted to the general surgical wards of AL-Hussain Medical City, Kerbala, Iraq, with hepatic hydatid cysts that had surgical management during a period of one and half year from January 2013 to June 2014, A card index of 40 cases with all necessary information was established: Full history, clinical examination, preoperative assessment & concentrating on age, sex, residency, chief complaint, history of present illness, past medical & surgical history, drug history and list of investigations which include general investigations (haematological, biochemical and serological). And the radiological examinations (plain X-ray, U/S , C-T scan and MRI-MRCP) .

The duration of hospital stay (in days) was taken as the total number of nights spent in the hospital.

All major postoperative complications were recorded including wound infections, abdominal collections, abscesses, persistent drainage, postoperative jaundice, respiratory & urinary tract infections.

Follow up of the patient from the time of surgery till the discharge of the patient from hospital with recording all related clinical parameters.

Results

Forty patients with hepatic hydatid cysts were enrolled in this study. 22 patients (55%) were males & 18 patients (45%) were females. The peak age group of patients was 30 - 40 years for both sexes (table 1).

The mode of clinical presentations of hepatic hydatid cysts was as follows:

Twenty-one patients (52.5%) presented with abdominal pain or discomfort, six patients (15%) with palpable mass, five patients (12.5%) with jaundice, two patients (5%) with rupture of cyst (acute abdomen), & six patients (15%) were diagnosed incidentally (table 2).

The main lobe affected was the right lobe in 22 patients (55%) while the left lobe in

4 patients (10%). Both right & left lobes were affected in 14 patients (35%) (figure 1).

The cysts were single in 24 patients (60%) & multiple in 16 patients (40%), twelve patients (30%) had recurrent disease. Fifty percent of multiple hydatid disease was recurrent disease, while the other 50% was primary hydatid disease (table 3).

U/S examination was carried out in 39 patients (97.5%), CT scan in 24 patients (60%), while MRI in 18 cases (45%). 4 patients were diagnosed by CT scan and 2 patients with obstructive jaundice by MRI-MRCP. Two patients with intraperitoneal rupture of hydatid cyst were diagnosed during laparotomy.

Associated extra-hepatic hydatid cysts were found In 10 patients (25%). The concomitant extrahepatic abdominal organs affected were the spleen in 3 patients (7.5%), renal in 1 patient (2.5%) and pelvis in 1 patient (2.5%). Patients who had previous operation for hydatid cyst extra-abdominally were 3 (7.5%) in the lung and 1 (2.5%) in the bone (table 4).

Complicated cases of hydatid cyst were the following (32.5%):

1. Eight patients (20%) with suppuration (infected hydatid cysts).
2. Three patients (7.5%) with intrabiliary rupture causing common bile duct obstruction.
3. Two patients (5%) with intraperitoneal rupture (as acute abdomen presentation).

The largest number of hydatid cysts in the liver in a single patient was 9 cysts. The largest size of hydatid cyst was approximately 30 cm in diameter.

Twenty-two patients (55%) were living in rural areas, while 18 patients (45%) in urban areas (figure 2).

Surgical treatment: The majority of patients 24 (60%) operated laparoscopically and 10 patients (25%) were explored by Kocher's incision, another 4 (10%) by right paramedian incision, while the remaining 2 (5%) of

patients through extended midline incisions.

The mode of surgical treatment was by excision & external tube drainage in 32 patients, (80%), 8 patients (20%) were treated with excision & omentoplasty.

Scolicidal agents used were Povidon iodine (10%).

At discharge of patients from hospital, all those with recurrent hydatid disease and cases of ruptured hydatid cysts (intraperitoneal, intrabiliary) who were totally 18 patients (45%), were recommended to have chemotherapy for 6weeks in the form of albendazole (10 mg/kg in 2 divided doses).

Period of Hospitalization: It ranged from 2-20 days. Average period of hospitalization in patients with liver hydatid was 7 days (table 5).

Morbidity & Mortality (table 6):

A. The general post-operative complications (20%):

1. Wound infections: 5 patients (12.5%), which were simple wound infections treated with antibiotics except one patient who needed drainage of abscess collection.
- 2- Respiratory tract infection: occurred in 4 patients (10%) who had effectively treated with antibiotics & chest physiotherapy.
3. Urinary tract infections: developed in 3patients (7.5%), all of them had self-retaining catheters & treated effectively with antibiotics.

B. The specific postoperative complications (15%):

1. Persistent drainage through the tube drain: this occurred in three patients (7.5%), all of them had infected hydatid liver cysts & was managed conservatively.
2. Abscess collection in the residual cavity of hydatid cyst: occurred in two patients (5%), the original operation for their hydatid cysts were excision with external tube drainage, both of them were treated effectively with percutaneous drainage under U/S monitoring & antibiotics.
3. Persistent obstruction of common bile duct: occurred in one case (2.5%) of

obstructive jaundice due to intrabiliary rupture of hydatid cyst for whom ERCP with endoscopic papillotomy and drainage was carried out with good outcome.

No mortality was reported during hospital stay of our patients.

Table 1. Age & Sex Distribution in Patients with Liver Hydatid

Age group	Male	Female	No. of case	Percentage
<10	-	1	1	2.5%
10-20	2	2	4	10%
21-30	2	5	7	17.5%
31-40	8	6	14	35%
41-50	6	1	7	17.5%
51-60	4	2	6	15%
>60	-	1	1	2.5%
Total	22	18	40	100%

Table 2. Modes of Clinical Presentation in liver hydatid cysts

Presenting cause	N (%)
Abdominal pain and/or discomfort	21 (52.5%)
Palpable mass	6 (15%)
Jaundice	5 (12.5%)
Acute abdomen (rupture)	2 (5%)
Incidental	6 (15%)

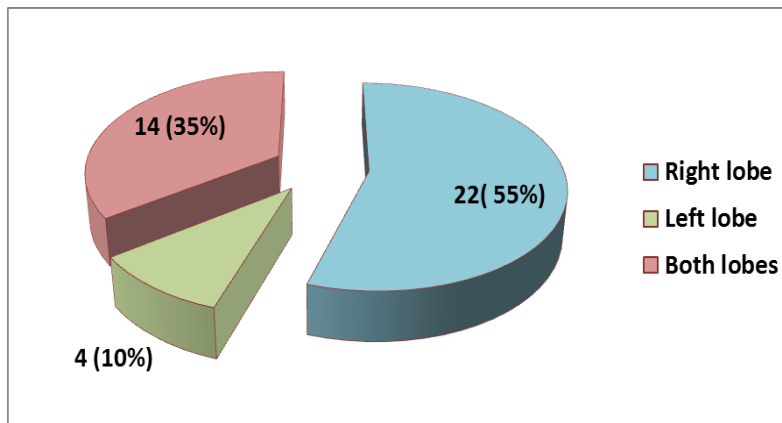


Figure 1. Distribution of hydatid cysts in the Liver Lobes

Table 3. Incidence of Single & Multiple Hydatid Cysts in Primary & Recurrent Hydatid Diseases

Type of hydatid disease	Single hydatid cyst	Multiple hydatid cysts
Primary hydatid disease	20 (50%)	8 (20%)
Recurrent disease	4 (10%)	8 (20%)

Table 4. Extra-hepatic hydatid cysts

Site	N (%)
Spleen	3 (7.5%)
Renal	1 (2.5%)
Pelvis	1 (2.5%)
Pulmonary	3 (7.5%)
Bone	1 (2.5%)

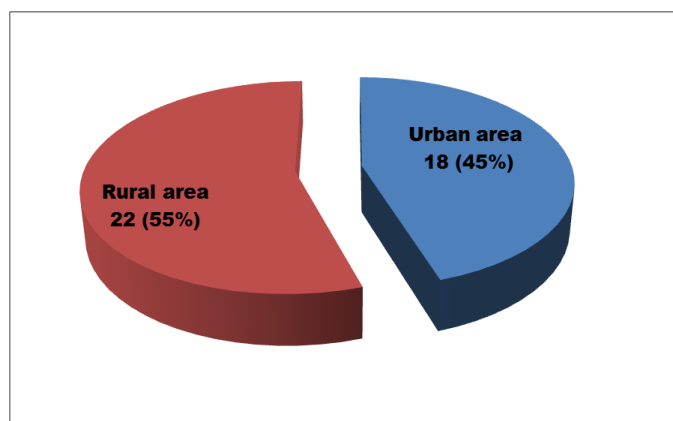


Figure 2. Geographical Distribution of Liver Hydatid Patients

Table 5. Periods of Hospitalization in Patients with Hydatid cysts

Period of hospitalization (wks)	Number & %
< 1 week	30 (72%)
1-2 week	8 (22%)
>2 week	2 (6%)

Table 6. Post-operative complications

Complications	Number & %
1. Wound infection	5 (12.5%)
2. Respiratory tract infection	4 (10%)
3. Urinary tract infection	3 (7.5%)
4. Persistent drainage through tube drain	3 (7.5%)
5. Abscess collection (in residual cavity)	2 (5%)
6. Persistent Obstruction of CBD	1 (2.5%)

Discussion

The age of patients with liver hydatid ranged from 4-64 year . The commonest age affected in both males and females was the fourth decade which is similar to the study by Al-Mohana 1999 from Iraq⁽¹³⁾.

In our study, 22 (55%) patients were males & 18 (45%) were females in contrary to the study in which females were predominant^(14,15) while equal in both sexes in H. A. Gharbi study⁽¹⁶⁾.

The residency in rural districts were more susceptible for infection with hydatid disease, as we found that 55% of patients came from rural areas & 45% from urban areas & this is consistent with what is mentioned in literatures⁽¹²⁾

Recurrent hydatid disease was reported in 12 (30%) of our cases & most of patients with recurrent disease tend to have multiple cysts in the liver (table 3). The recurrent hydatid disease might be due to

reinfestation or spillage of hydatid fluid and its contents during the operation.

In our study, the hydatid cysts were located in the right lobe of the liver in 22 (55%) of patients, the left lobe in 4 (10%) and in both lobes in 14 (35%), similar findings have also been reported by other authors^(1,17). The higher right lobe affection than the left is probably due to the larger bulk of liver tissue and larger blood supply.

The commonest clinical presentation in our patients was abdominal discomfort or pain, which was found in 52.5%, which has also been reported by other authors^(3,18). Other clinical presentations were palpable mass in 15% of patients, jaundice in 12.5%, acute abdomen presentation in 5% and incidental diagnosis (asymptomatic cases) in 15%, which are nearly similar to the results reached by Al-Mohana 2000 from Iraq⁽¹⁹⁾.

This percentage of asymptomatic patients, who were diagnosed

incidentally, reflects the necessity of high index of suspicion of Echinococcal infestation in patients who present with an abdominal mass, pain, fever, jaundice, or anaphylaxis⁽²⁰⁾.

Certain features in US, CT, or MRI may warn of biliary communication or impending cyst rupture^(17,21). Biliary involvement may be confirmed by MRI or ERCP^(1,21). Ultrasonographic appearances have also formed the basis of classification of liver hydatid cysts by various authorities like Gharbi⁽¹⁶⁾, WHO⁽⁶⁾. Serologic tests have a sensitivity of 65% to 90%⁽²²⁾ but are not routinely performed in our practice.

In our study, U/S had been done for all patients except one case of acute intraperitoneal rupture of hydatid cyst. however U/S is the initial procedure of choice for diagnosis of suspected hydatid cyst in the abdomen. It is easy, non-invasive, accessible, of low cost, without side effects & can allow accurate localization of the cyst, but it is an operator's dependent examination.

The concomitant extra-hepatic organs affected was the spleen (7.5%) similar to study by ALSamarrae 1998 from Iraq⁽²³⁾, while in the literatures the lung is affected in (15%) or more in patients with hydatid cysts^(2, 24).

Cystobiliary communications were demonstrated in 22% of our patients, while in Al-Mohana study 11% . This reflects the importance in surgical treatment of residual cavity of hydatid cyst to verify any leakage of bile from its wall & if this exists, we try to suture it carefully with non-absorbable suture to prevent subsequent biliary fistula or prolonged drainage of bile^(20, 25).

Surgery remains the mainstay of treatment for hepatic echinococcosis. A variety of surgical procedures are done for hydatid cysts of the liver. These include marsupialization, closed total cystectomy, partial pericystectomy, partial pericystectomy with omentoplasty, and

typical and atypical liver resections.^(1,25,26,27)

In our series, the laparoscopic operative technique was one of the followings :

a. Cyst evacuation with external tube drainage in majority of case (80%). Excision & external tube drainage had been used when there was a big cavity (sizeable cyst), suppuration (infected cyst), bile leak & in case of absence of healthy or accessible omentum e.g. rudimentary omentum (in elderly & in previous abdominal surgery).

b. Excision & omentoplasty in 20%. Excision & omentoplasty used when was no suppuration & with presence of healthy accessible omentum. This method is preferred by most surgeons and they do it wherever it is feasible. The low percentage of patients treated by this method was due to unavailability of accessible omentum.

However, the choice of these surgical techniques depends on surgeon's preference & experience, size, site & number of cysts & presence or absence of infection, biliary communication & adequate length of healthy omentum.

Various laparoscopic techniques described are total pericystectomy, puncture and aspiration of contents followed by marsupialization, unroofing and drainage, unroofing and omentoplasty,^(28,29,30,31) One of the problems faced in laparoscopic treatment of liver hydatid cysts is the difficulty in evacuating the particulate contents of the cyst, the daughter cysts, and laminated membrane. Various instruments have been described to evacuate the contents of hydatid cysts. Initially they used a large transparent beveled cannula. Later on, they modified the technique somewhat by creating a continuous vacuum inside the cannula while its tip was firmly adhered to the cyst wall⁽¹¹⁾. Al-Shareef et al⁽³⁰⁾ used a liposuction cannula to evacuate hydatid cysts.

In our medical city we started laparoscopic management of hepatic hydatid cysts since few years, so that

nearly in all cases we started with laparoscope to treat the cyst but some time it was impossible to complete the operation laparoscopically and convert to traditional method and the main indications for conversions in our study were:

- Big cyst with huge number of daughter cysts.
- Adhesions either from previous operations or from the cyst itself.
- Multiples cysts (more than four) with daughter cysts.
- When there were hepatic and other organs (e.g. spleen) cysts.

General post operative complications in laparoscopic operations include: wound infection, respiratory tract infection, urinary tract infection, and those complications related to surgical technique, include : Persistent drainage through tube drain in 3 patients (7.5%), abscess collection in the residual cavity in 2 patients (5%) and persistent obstruction of common bile duct in 1 patient (2.5%). Complications seen in open surgery include pleural effusions, infections, biliary fistulae, sub-diaphragmatic collection, liver abscesses. ^(1,8,20,28) Thus, with laparoscopic management, the severity of complications decreases when compared with that in open surgery.

The overall morbidity specifically related to the surgical technique was 15% of our patients. Most of these complications were managed conservatively with good outcome.

No mortality had been reported in our series.

The mean hospital stay was 5-7 days.

Conclusions

1. The high incidence of recurrent hydatid cyst in our collection in addition to the multiplicity of cyst reflect the fact that this disease is still a problem in our country.

2- Laparoscopic treatment of the hepatic hydatid cysts is simple and with great benefits with specific indications.

3- Even in open operative surgery the preliminary laparoscope is useful for diagnostic laparoscopy and adhesiolysis with accurate localization of the hepatic hydatid cysts.

Recommendation

1. Measures should be taken for prevention of hydatid disease in our country by adopting serious and drastic measures that aim to break the life cycle of this disease at multiple points and to enforce this control programs by a law .

2. Laparoscopic treatment of the hepatic hydatid cyst is a new method with great advantages and minimal disadvantage and we highly recommend to assess any patient for laparoscopic treatment.

References

1. Koti RS, Kanoria S, Brain RD, the liver, in Short Practice of Surgery, Bailey and Love's. Norman S. Williams & Christopher J.K. Bulstrode & P. Ronan O'connell . 26th edition; 2013. Pages1065-1080.
2. Dimitrios F, Georgios F, Vassilios P. "Advances in Liver Echinococcosis: Diagnosis and Treatment". Clinical Gastroenterology and Hepatology. Feb 2007, Vol. 5, No. 2: pages 152-159.
3. Nunnari G, Pinzone M R, Gruttadauria S. "Hepatic echinococcosis: clinical and therapeutic aspects". World Journal of Gastroenterology. 2012 Vol. 18, no.13: pages 1448-1458.
4. Moro P, Schantz PM. "Echinococcosis: a review". International Journal of Infectious Diseases. 2009 Vol. 13, no. 2: pages 125-133.
5. Sharma D, Babu R, Borgharia S, Baruah D, Thomas S, Kumar A. "Laparoscopy for liver hydatid disease: where do we stand today? ". Surgical Laparoscopy, Endoscopy & Percutaneous Techniques. 2009; Volume19: pages 419-423.
6. World Health Organization. "Echinococcosis Fact sheet N°377". March 2014. Updated March 2014.
7. Souadka, Malki EI, Omar H. "Laparoscopic Approach for Liver Hydatid Cyst". Surgical Laparoscopy, Endoscopy & Percutaneous Techniques: august 2014, Vol.24. Issue 4. Pages 391.

8. Jonathan BK. "Laparoscopic treatment of hepatic hydatid cyst". ANZ Journal of Surgery. July/August 2012. Volume 82, Issue 7-8, pages 499-504.
9. Yaghan R, Heis H, Bani-Hani K. "Is fear of anaphylactic shock discouraging surgeons from more widely adopting percutaneous and laparoscopic techniques in the treatment of liver hydatid cyst? "American Journal of Surgery. 2004. 187 : pages 533-537.
10. Tai QW, Tuxun T, Zhang JH, Zhao JM, Cao J, Muhetajiang M, Bai L, Cao XL, et al. "The role of laparoscopy in the management of liver hydatid cyst: a single-center experience and world review of the literature". Surgical Laparoscopy, Endoscopy & Percutaneous Techniques. 2013 Apr. Volume 23:pages 171-175.
11. Misra MC, Khan RN, Bansal VK, Jindal V, Kumar S, Noba AL, et al. "Laparoscopic pericystectomy for hydatid cyst of the liver". Surgical Laparoscopy, Endoscopy & Percutaneous Techniques. 2010. Volume 20, pages 24-26.
12. Eckert J, Deplazes P. "Biological, epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing concern". Clin. Microbiol. January 2004 Rev. 17 : pages 107-135.
13. Al-Mohana J M. "Surgical treatment of hydatid cyst of the liver". Kufa Medical Journal: 1999: pages 118-124.
14. Goyal S, Pandit S, Raina R, Maurya S. "Our Initial Experience of Laparoscopic Management of Liver Hydatid Disease in a Rural Medical College". Archives of Clinical and Experimental Surgery (ACES). 2013; 2: pages 16-23.
15. Suguna SH, Rajendra CP, Jessica M. "Morbidity pattern of hydatid disease (cystic echinococcosis) and lack of its knowledge in patients attending Mamata General Hospital, Khammam, Andhra Pradesh". 2008. Volume : 51. Issue : 1. Page : 143-145.
16. Gharbi H A, Hassine W, Brauner M W, Dupuch K. "Ultrasound examination of the hydatid liver". Radiology. Volume 139, issue 2.
17. www.uptodate.com. "Treatment-of-Echinococcosis in Humans". last updated: Mar 6, 2013.
18. Barnouti HN: "Human hydatid disease (Echinococcosis), Review Article". Arab Journal of Medicine, Vol. 4 No, 8: page 20-27.
19. Al-Mohana JM. "Percutaneous management of hydatid liver disease". Dep. Of Surg., Kufa Un., Med. College, Kufa Medical Journal 2000, Vol.3 No. 1: page 9-12.
20. Hamid R, Shera AH, Bhat A, Baba AA, Abdul Rashid, Akhter A. "Hydatid cyst of liver: Spontaneous rupture and cystocutaneous fistula formation in a child". Journal of Indian Association of Pediatric Surgeons, Vol. 17, No. 2, April-June, 2012, pages 73-74.
21. Marrone G, Crino F, Caruso S, Mamone G, "Multidisciplinary imaging of liver hydatidosis". World Journal of Gastroenterology. 2012 April 7; 18: pages 1438-1447.
22. Mamuti W, Sako Y, Nakao M. "Recent advances in characterization of Echinococcus antigen B". Parasitology International. 2006. Vol.55 pages:S57-S62.
23. Alsammarae AG. "Hospital based study of hydatid disease in Salah Al- Deen Province". Dep. of anatomy and surgery, Tikrit Un., collage of medicine, The Medical Journal of Tikrit University; 1998, 4: pages 62-64.
24. Rokni MB. "Echinococcosis /hydatidosis in Iran". Iranian Journal of Parasitology 2009. 4: pages 1-16.
25. Morris DI Kune GA: Hydatid disease of the liver in Maingot's abdominal operation, 12th edition; 2014.
26. Stoot JH, Jongsma CK, Limantoro I, Terpstra OT, Breslau PJ. "More Than 25 Years of Surgical Treatment of Hydatid Cysts in a Nonendemic Area Using the "Frozen Seal" Method". World Journal of Surgery (2010) 34: pages 106-113.
27. Taleb H. "Hydatid disease in Iraq". British Journal of Surgery. August 1968 ; Vol.55 (Issue 8): pages 576 - 584.
28. Hasan HM, El-Sayed OM. "Laparoscopic treatment of liver hydatid cyst". Journal of Medicine and Biomedical Sciences 2010. Vol.1. pages 47-51.
29. Tuxun T, Zhang JM, Zhao JM, Tai QW, Abudurexti M, Zhang H. "World review of laparoscopic treatment of liver cystic echinococcosis-914 patients". International Journal of Infectious Diseases July 2014 Volume 24, Pages 43-50.
30. Al-Shareef Z, Hamour OA, Al-Shlash S, Ahmed I, Mohamed AA. "Laparoscopic treatment of hepatic hydatid cysts with a liposuction device". JSLS (Journal of the Society of Laparoendoscopic Surgeon) 2002 Oct-Dec. 6: pages 327-330.
31. Busić Z, Lemac D, Stipancić I, Busić V, Cavka M, Martić K. "Surgical treatment of liver echinococcosis - the role of laparoscopy". Acta Chir Belg 2006;106. pages 688-691.