UNIVERSITY OF MEDICINE AND PHARMACY OF CRAIOVA
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DOCTORAL THESIS
ABSTRACT

CLASSIC AND MODERN SURGICAL TREATMENT OF
HEPATIC HYDATID CYST

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KEY WORDS: hydatid cyst liver, conservative surgical intervention, radical surgical intervention, laparoscopic surgery, biliary fistula, papilosfincterotomy,
I. MOTIVATION AND OBJECTIVES

Liver hydatid cyst (CHH), parasitosis caused by cystic tumor development in the human body of larvae of Taenia Echinococcus Granulosus, is a disease known since antiquity, studied over time but a very topical today. Although a benign disease, through a rather complex evolution can be considered an extremely serious condition, because in addition to direct mechanical action exerted by the liver and many local Morphological changes which it induces, hydatid cyst is a negative impact on the entire body by toxic-allergic action.

Surgical treatment of hepatic hydatid cyst is far better to be encoded and continues to be the subject of numerous medical contradictions.

Given the very complex issues raised by hydatid disease and therapeutic controversies that exist, we have proposed methods obtained for a comparison between radical and conservative surgical therapy for hepatic hydatid cyst to deduct such classic surgical indications and treatment outcomes; We also analyzed the results of laparoscopic surgery in hydatid cyst as a modern method of treatment and finally we discussed the issue of biliary fistula, postoperative complication of both classical and modern procedures of treatment.

The objectives of this paper are:
1. Comparative analysis of the effectiveness of radical versus conservative surgical methods, the classic treatment of liver hydatid cyst;
2. The feasibility, safety and effectiveness of laparoscopic treatment in liver hydatid cyst; establish a correlation between the type of treatment performed and hydatid disease relapse;
3. Establish a correlation between the type of treatment performed and hydatid disease relapse;
4. Establish interrelationships among various factors analyzed and the occurrence of postoperative biliary fistula as a complication present in both types of therapy practiced;
5. Deduction of an algorithm for diagnosis and treatment of postoperative biliary fistula;
6. Overall analysis for the etiopathogenesis, diagnosis and treatment of hydatid cyst in the context of current developments;

II. MATERIAL AND METHODS

The study of this work was conducted between January 2000 - December 2009 by a total of 174 patients diagnosed with hepatic hydatid cyst and surgical intervention, patients were hospitalized in the Surgical Clinic and Surgical Clinic III Craiova.

In order to achieve the objectives that we have proposed in this paper, we conducted three studies, grouping the 174 patients in three different groups:

Group I included a number of 162 patients diagnosed with hepatic hydatid cyst undergoing classic surgery. To perform comparative analysis of the effectiveness of radical versus
conservative surgical methods that we have proposed a first objective, we divided the patients in this group into two subgroups:

- **A group** composed of 118 subjects (72.83% of patients operated classic) who underwent conservative surgery (partial or full intervention kept pericystic);
- **Group B** consists of 44 subjects (27.17% of patients operated classic) who underwent radical surgery (completely excised pericystic intervention);

**Group II** included a total of 12 patients diagnosed with hepatic hydatid cyst but undergoing laparoscopic surgery between January 2007 - December 2009.

**Group III** included a total of 39 patients diagnosed with postoperative biliary fistula, a complication occurred consecutively applied to the surgical treatment of patients in group I and group II.

**Criteria for inclusion of patients in the study:**
1. patients diagnosed with hepatic hydatid cyst strictly localized;
2. patients diagnosed with hepatic hydatid cyst undergoing classic surgery or surgery combined with traditional medical treatment for patients in group I;
3. patients diagnosed with hepatic hydatid cyst undergoing laparoscopic surgery for patients in group II.

**Exclusion criteria for patients in the study:**
1. patients diagnosed with localized extrahepatic hydatid cyst;
2. patients diagnosed with hepatic hydatid cyst small as 5-6 cm. diameter, who underwent medical treatment and dispensarizați;
3. patients diagnosed with calcified liver hydatid cyst of small size which did not receive any treatment.

Necessary study data were extracted from patients clinical observation sheets and surgery protocols and then statistically. All patients were evaluated in this study take the following data:
- demographic data (age, sex, living environment, the dynamics of admissions, etc.) that were statistically processed; clinical and paraclinical results to assess the relevance of various symptoms or diagnostic laboratory explorations, the results of different types of treatments, expressed through morbidity, number of reinterventions, mortality, length of stay, disease recurrence. All data collected for this study were stored in Windows Excel files. For statistical processing of data were used the following types of statistical tests: tests to measure the dependence between parameters (Pearson correlation coefficient, chi squared $\chi^2$) and significance tests (Anova and Student).

### III. RESULTS AND DISCUSSION

1. **THE RESULTS OF SURGICAL TREATMENT CLASSIC**

In a first step we conducted a comparative statistical analysis between the group of patients undergoing classic conservative surgical treatment (Group A) and the group of patients undergoing radical surgery classic (Group B) in terms of: demographic data, clinical symptoms and laboratory explorations. Between the two groups were not statistically significant differences were found, so that we can exclude the assumption that obtaining any different results from applying the two methods of surgical treatment which they consider to be due to differences in composition and structure of the two groups analyzed.
Intraoperative exploration finds the number of hydatid cysts, their location and their size. Statistical analysis shows that there is no statistically significant differences between the two groups in terms of location depending on the lobes of liver cyst (p = 0.672), in terms of cyst size (p = 0.632) nor in terms the number of cysts (p = 0.321), therefore the two groups is diverse variety. But if we analyze the distribution of hydatid cysts in two groups depending on their location by segmentaţia liver in group B we found that the predominant localization of cysts in the lateral segment of liver (79.53% of cysts are found in sections III and VI). Note that radical surgical methods have been preferred in hydatid cyst marginal locations, locations that allowed proper technique and have avoided the risk of interception of major bile, vascular pedicle. In group A the distribution of cysts in the lateral and medial segments are relatively well-proportioned.

Inactivation of parasite, while common surgical methods of treatment of both the conservative and the radical, we performed three types of substances using scolicide: hypertonic serum, absolute alcohol and Betadine solution (PVP-iodine). After applying the Student test according scolicidul studied groups used were not found statistically significant differences (p = 0.567) between the two groups.

The main problem in surgical treatment of hydatid cyst is how to deal with residual cavity pericystic, depending on which surgical procedures can be divided into two broad categories: conservative, either abandon pericystic cavity or a portion of pericystic resected and radical which completely removes pericystic cavity. By dividing patients according to these surgical procedures used, we created two groups trying to establish the advantages and disadvantages of conservative versus surgical methods of radical surgical methods.

Following statistical analysis applied to the results of two types of treatment we observed the following significant issues:

- For the average duration of conservative surgical intervention was 84 minutes (CI 95% on the average 80-87 min, standard deviation = 19.66; Limits 50-125min) with 41 minutes less than the average radical intervention 125min (IC95 % average of 117.43 to 135.56 min, standard deviation = 29.81; Limits 60-205min). The difference between the two areas was highly statistically significant (t test 10.39, p < 0.005).
- It is noted that in our study there were more complications in the group of patients operated on by conventional surgery group only 31.35% patients operated by radical surgery 20.45%, which is consistent with studies of literature specialty. Secchi MA et al. recorded in a 2010 study, 26% of postoperative complications after radical surgical procedures compared with 45% complications after conservative surgical procedures.
- This increased rate of complications among conservative interventions lead to an increase in the number of days of hospitalization of patients. Thus the average and standard deviation of days of hospitalization for surgery conservative group is statistically significantly higher (p = 0.024) compared with radical surgical group.
- Analyzing reinterventions rate (p = 0.563) or death (p = 0.583), we see that there is no statistically significant differences between the two types of surgical treatments.
- We recorded a recidivism rate of 10.49% of the disease, all cases are present in patients operated on by conservative methods, the study patients were followed postoperatively for a period of 11.43 ± 2.34 months. So from this point of view there is a clear difference between the results of two types of treatment.
2. THE RESULTS OF LAPAROSCOPIC SURGICAL TREATMENT

With regard to laparoscopic treatment of hydatid cyst, the priority is the selection of patients, which is respected by us and our group, so that patients undergoing laparoscopic surgery were generally young or middle aged patients, 75% falling between 31 and 50. We also selected patients with liver hydatid cyst located in the previous sections, 5 (51.66%) located in segment VI of the right hepatic lobe, 3 cases (25%) in the left lobe of liver segment III, two cases (16.66%) in two cases in segment IV and V hepatic segment (16.66%). All hydatid cysts were located marginal or side were corticalize and had an average size of 15.23 ± 2.12 cm. We also selected based on ultrasound and CT Young hydatid cysts, 75% of cases in stage I and II Gharbi, and we used the laparoscopic approach in 25% cases of hydatid cyst hydatid daughter who had stage III Gharbi.

In all 12 cases dealt perichistectomie laporoscopic I practiced partial dezoperculare broad, with subsequent drainage of residual cavity in 5 cases (41.66%) underwent laparoscopic cholecystectomy and associated treatment of hydatid cyst. The average duration of surgery was 92 minutes, 95% CI of the average 89-95 minutes, with limits between 70 and 182 minutes.

Postoperatively, there were two complications (16.66%), a residual abscess cavity of a postoperative biliary fistula. Residual abscess was resolved conservatively by systemic antibiotic lavage with antiseptic solutions and the drainage tubes. External biliary fistula, occurring at a patient who has cystic Bilio communication was highlighted and intraoperative laparoscopic sutured, the necesiat performing endoscopic papilosfincterotomy. After papilosfincterotomy bile flow decreased progressively until day 8, when it closed. There have been conversions of laparoscopic technique, reinterventions and no deaths in the group of patients treated laparoscopically.

All patients in this group were associated with albendazole treatment followed surgery to prevent recurrence. Albendazole was administered at a dose of 10mg/kg. bw / day, 5 days preoperatively and 3 months after surgery. Regular monitoring postoperative clinical and imaging showed no recurrence of hydatid disease in patients treated laparoscopically.

The average length of hospitalization was 10.32 ± 2.32 days, range between 7 and 16 days, complicated cases actually increased the average hospital.

3. THE RESULTS OF A STUDY ON BILIARY FISTULA

Following surgical treatment to patients with liver hydatid cyst taken in our study, we recorded a total of 39 postoperative biliary fistula (24.04%), which depending on the type of surgery, after which they appeared were thus distributed: the patients group 31 classic conservative surgery fistula (26.27%) and in group 7 patients operated radically classic biliary fistula (15.90%). After application of laparoscopic surgery have been a single postoperative biliary fistula, which have ranged from a fistula occurred in patients  in group A because I thought that occurred after a classic surgical treatment that is applied to the cavity remaining after a partial perichistectomie. Thus, finally, we recorded a group A total of 32 postoperative biliary fistula (27.11%).

Although the difference between the two groups expressed a 1.7-fold increase in the incidence of biliary fistula in patients with conservative intervention compared to those with radical intervention in terms of the difference was not statistically significant because p = 0.13.

After analyzing the results of postoperative biliary fistulas lot we found the following significant features:
• appearance has a high frequency of biliary fistulas in the right hepatic lobe and central segments IV, V, VI, VII, and this is seen in the reference studies, being explained by the fact that the pedicle at this level is important to develop relationships bile hydatid cyst.
• Following the finding in our study we believe that if it shows a biliary fistula intraoperatively, even if it succeeds in achieving its sutures, however, be associated with bipolar drainage to reduce the risk of mxim a biliary fistula postoperative external.
• Conduct as external biliary fistula treatment we believe, as our study and showed that the biliary fistula with conservative treatment is useful at low speeds, while neintervențional fistulas with high flow method is most appropriate internal sphincterotomy endoscopically.
• Statistical analysis of average days of development of postoperative fistulas see that there is a statistically significant difference between the two groups, the number of hospitalization days of fistulas occurred after conservative surgery (an average of 39.24 days) is significantly higher compared with those of fistulae produced after radical surgery (an average of 23.54 days).
• We present an algorithm for diagnosis and treatment of biliary fistula after surgery of hydatid cyst of liver products, derived from our study.

**Algorithm for diagnosis and treatment of biliary fistula**

![Algorithm Diagram]

- Icteric
  - Angiocolitis
  - ECO sau CT
  - Gharbi IV

- Dg. preoperator
  - Fistula biliara

- Dg. intraoperator
  - Bila in CHH
  - Injectare colorant in CBP - colorant in CHH

- Dg. postoperator
  - Fistula biliara

- Tratamentul intraoperator al fistulei biliare
  - Sutura fistulei cu fire în "X";
  - Dreapă bipolar;
  - Anastomoză perihepatică digestive;
  - Chistectomie ideala;
  - Hepatectomie

- Tratamentul postoperator al fistulei biliare
  - Fistule mari > 300 ml/zi
  - Fistule mici < 300 ml/zi

- Reinterv. chirurgică
  - Tratament conservator
  - ERCP

- Postoperator absenta fistulei biliare
  - Vindecarea fistulei 30-78 zile

- Postoperator fistula biliara prezenta
  - Vindecarea fistulei 12-36 zile
IV. CONCLUSIONS

1. Liver hydatid cyst is a complex disease due to polymorphism or structural, topographical and evolving, still raises many diagnostic problems, especially tactical and technical operative so far there are no standard surgical treatment.

2. Although it is a condition which is known ethiopathogenie and for which prevention methods could be applied so as to decrease its prevalence, hepatic hydatid cyst disease is still showing a steady rate of infection.

3. Symptoms of poor hydatid disease in conjunction with a poor public health education are factors that may explain why in our study 52.46% cases of hepatic hydatid cyst were diagnosed in stage complications. This development in recent years at the expense of laboratory diagnostic methods of liver hydatid disease.

4. Although in recent years have greatly expanded the therapeutic methods minimally invasive therapy in hepatic hydatid cyst still prevalent use of traditional surgical treatment. In the classic surgical treatment is found mainly using conservative surgical techniques compared with the radical.

5. In the conservative techniques best results we have obtained using partial perichistectomia associated with bile duct drainage and cholecystectomy in principle. Although the duration of the intervention is greater, postoperative morbidity is low.

6. The radical interventions, using total cystectomies led to best results, recorded postoperative complications and morbidity reduced introperatorii low.

7. The number of postoperative complications is higher compared with conservative chirugiei consecutive radical surgery. Also the number of days of hospitalization is significantly higher for conservative surgery. Biliary fistula, registered 1.7 times more frequently after conservative surgery than after radical surgery, the complication that led implicitly to increase the duration of hospitalization in the group of conservative interventions.

8. Following the use of radical surgical procedures, postoperative recurrence of hydatid cyst, concern with important repercussions on the medical and social, was significantly lower compared with conservative procedures.

9. Use of laparoscopic treatment in well selected cases lead to good results in terms of postoperative pain and shorten hospital patient. Occurrence of biliary fistula complications during hospitalization increases, but becomes comparable to the classical surgery.

10. Relapse rate for laparoscopic treatment of hepatic hydatid cyst was zero, this being explained by a careful selection of cases (hydatid cyst marginal easily isolated neproligere mostly) and the correct combination drug therapy with Albendazole.

11. The occurrence of postoperative bile fistulas were statistically higher for cysts located in liver as compared with the left and central segmnetele compared side.

12. The occurrence of postoperative bile fistulas were statistically higher for cysts located in the right hepatic lobe versus left lobe liver and central segmnets compared side.

13. Using papilosfincterotomiei endoscopic surgery in the treatment of external biliary fistula was followed by positive development of the fistula with closure over a period of 9-12 days.

14. The algorithm for diagnosis and treatment of postoperative biliary fistula which I inferred from this study can be observed that practically turns using an endoscopic sphincterotomy biliary fistula in a high flow with low flow significantly reducing the time needed healing.
SELECTIVE REFERENCES


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