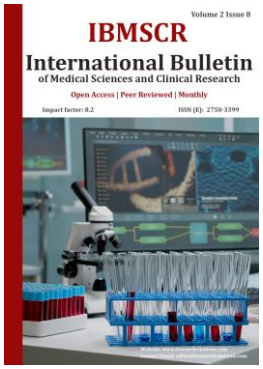

IMPROVEMENT OF SURGICAL ASPECTS IN LIVER ECHINOCOCCOSIS

Akhmadjonov Javokhir Uktamali o'g'li
Master of Andijan State Medical Institute
Tojiboyev Zarifjon Qofirjonovich
ADTI master
Qosimov Adham Lutfullayevich
Scientific supervisor: Professor
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Abstract:A hydatid disease is a serious public health problem in Uzbekistan. Surgical treatment is the main treatment of hepatic echinococcosis. Considering high rate of recurrence of the disease the search for new methods of surgical treatment remains relevant. The aim of the study was to improve the efficiency and safety of surgical treatment of hepatic echinococcosis; to develop a new physical method for cleaning residual cyst cavity.
Keywords: Improvement of surgical, Echinococcosis, Liver, Hydatid cyst, Residual cavity of the liver.

Hydatidosis or Echinococcosis is a parasitic disease which is widely spread all over the world. It is not uncommon in Western Europe, mostly because of the high presence of immigrants from the endemic places. Echinococcosis is a zoonotic infection caused by larval stages (metacestodes) of cestode species of the genus Echinococcus. Four species of Echinococcus cause infection in humans. *Echinococcus granulosus* and *Echinococcus multilocularis* are the most common, causing cystic echinococcosis (CE) and alveolar echinococcosis (AE), respectively. The two other species, *Echinococcus vogeli* and *Echinococcus oligarthrus*, cause polycystic echinococcosis and are less frequently associated with human infection. Cystic echinococcosis has a worldwide distribution, while hepatic alveolar echinococcosis (AE) is endemic in the Northern hemisphere, including North America and several Asian and European countries, like France, Germany and Austria. Humans often come into contact with *Echinococcus* eggs via touching contaminated soil, animal feces (faeces – manure) and animal fur. Infection begins with the ingestion of tapeworm eggs, which in the human intestine hatch into embryos that penetrate the small bowel mucosa, enter venules and travel via portal circulation to the liver. The most commonly infected organ of the cystic echinococcosis is in the liver (in 75% of cases), the lungs and other organs in the body. Unusual locations of hydatid cysts support the hypothesis that beside portal circulation, the echinococcus embryos can spread via other routes, such as the lymphatic system, the biliary tract and/or by dissemination of daughter cysts into peritoneal or other cavities with the rupture of the primary cyst.

The disease develops as a slow-growing mass in the body, often called cysts. Echinococcal cysts are slow growing, but can cause clinical symptoms in humans and be life-threatening. Cysts may not initially cause symptoms, in some cases for many years. The diagnose of cystic echinococcosis is based mainly by imaging, while serology tests such as indirect hemogglutination, enzyme linked immunosorbent assay, immunoblots or latex agglutination that use antigens specific for *E. granulosus* are used to verify the imaging results. The imaging technique of choice for cystic echinococcosis is ultrasonography since it is not only able to visualize the cysts in the body's organs but it is also inexpensive, non-invasive and gives instant results.

In addition to ultrasonography, both MRI and CT scans can and are often used although an MRI is often preferred to CT scans when diagnosing cystic echinococcosis since it gives better visualization of liquid areas within the tissue. Management options for cystic echinococcosis (CE) include surgery, percutaneous management (puncture, aspiration, injection, and respiration), drug therapy, and observation. The laparoscopic approach is controversial because of lack of experience with this technique. The overall frequency of postoperative complications was 18.9%. Early surgical complications were noted in 9.9% of them: seromas of postoperative wounds were developed in 8 (3.3%) cases; suppuration of postoperative wounds was noted in 5 (2.1%) patients; bile duct drainage from the abdominal cavity was noted in 4 (1.6%) cases in the postoperative period; an external bile fistula was developed in 3 (1.2%) patients in the postoperative period; biliary peritonitis was developed in 2 (0.8%) cases (1 patient had a fatal outcome); a subphrenic abscess in 1 (0.4%) patient was formed in the postoperative period; a clinics of early adhesive intestinal obstruction was developed in 1 (0.4%) observation.

General complications in the postoperative period were developed in 5.8% of cases: reactive pleuritis was developed in 5 (2.1%) cases; 7 (2.9%) patients had pneumonia; the development of acute myocardial infarction which caused the death of the patient was noted in 1 (0.4%) patient; pulmonary thromboembolism which led to death occurred in 1 (0.4%) case.

The frequency of late surgical complications made up 3.3%: in 4 (1.6%) patients a residual cavity of the liver was diagnosed, suppuration of the residual cavity was observed in 2 (0.8%) cases, postoperative ventral hernia was developed in 1 (0.4%) patient, acute adhesive intestinal obstruction was developed in 1 (0.4%) case. Thus, clinical treatment results analysis of patients in the control group showed that the frequency of postoperative complications was quite high (18.9%). Mortality in this case made up 1.2%.

We conducted a critical analysis of postoperative complications in the control group, the purpose of which was to identify existing shortcomings and to eliminate them. As the analysis of the results showed, one of the main reasons for the development of postoperative complications was the incomplete preparation of the surgeon for surgical intervention, inadequate intraoperative processing of EC, and low antiparasitic effectiveness of the agents used to treat the residual cavity. We carried out bacteriological crops to clarify the role of microbial flora on the results of treatment. These studies were carried out before (at the time of puncture of EC and obtaining echinococcal fluid) and after treatment of the residual cavity of the liver (RCL) (after treatment of RCL before capitonnage). Analysis of bacterial crops showed that after treatment of RCL, the level of both aerobic and anaerobic cultures was not decreased, especially from the initial level. The remaining bacterial focus contributed to the development of various infectious complications. Analysis of the lethal outcome against the background of the biliary peritonitis development showed that suturing of the large fistulas does not allow to get adequate tightness, and when tightness was achieved the risk of its failure development was high.

We have developed a system for assessing the severity of surgical interventions in LE. This scale included 7 main criteria: the number of cysts; the presence of combined injury of other organs; localization of cysts by liver segments; features of localization of cysts; the presence of LE complications; diameter of cysts; concomitant pathology that affects the technical aspects of surgical intervention. Each criterion was conditionally divided into three gradations: light,

moderate and severe. Depending on the combination of different gradations of the severity criteria, all operations at LE were divided into three degrees.

A "light" surgical intervention was considered in the presence of "light" criteria of severity or their combination with at least one criterion of "medium" severity; "medium" severity - in the presence of "light" criteria or their combination with criteria of "medium" severity or a combination of "light" and "medium" criteria of severity with at least one criterion of "severe" degree; "severe" severity - with various combinations of "light" and "mediun" in combination with at least 2 "severe" criteria of severity. All this contributed to the fact that, based on a retrospective analysis of the control group results, we created a system for the quantitative assessment of preparedness - the surgeon's rating. At a general rating of up to 3.4 points, the surgeon does not have the right to independently perform the operation; at a rating from 3.5 to 4.3 points, the surgeon can independently perform operations of the "light" degree and the operation of "medium-severe" degree together with the surgeon of a higher rating; at a rating from 4.4 to 10.5 points, the surgeon can independently perform "medium-severe" operations with a surgeon of lower professional training, and with a surgeon of a higher rating he can perform "severe" operations; and finally, a surgeon with a rating of 10. 6 points or more can perform any surgical intervention at LE.

When a diameter of the bile fistula was 5 mm or more, in the presence of inflammation, infiltration or calcification of tissues around the fistula, with a central localization of the fistula, we proposed a new method for closing it. After common echinococcectomy, a trapezoidal flap was cut from a removed fibrous capsule. On the wall of the fistulous opening, along its circumference, at a distance of 2–3 mm from each other, sutures were applied to which the top of the flap was sewn. When tightening the sutures, the fistulous opening was closed with a flap in the form of an airtight patch which provided sufficient reliability of the sutures.

We proposed the use of an electrolysis aqueous solution (EAS) of sodium hypochlorite for intraoperative treatment of the cavity of the removed EC. We conducted screening studies in the concentration range from 0.1 to 0.8% with a processing time of 1 to 30 minutes to study the antiparasitic effect of EAS of sodium hypochlorite. The conducted studies have shown that treatment with 0.8% solution for 4 minutes, 0.4% and 0.6% solutions for 5 minutes had the highest antiparasitic effect. Morphological studies of the chitin and fibrous membranes, liver parenchyma showed that the safest treatment is 0.4% EAS of sodium hypochlorite for 5 minutes.

Based on the foregoing points, we proposed a tactic for the surgical treatment of LE which consisted of a differentiated approach to the choice of a surgical team, the use according to the indications of our proposed technical working-out for echinococcectomy, intraoperative treatment with EVR of sodium hypochlorite, which along with antiparasitic action had a high antimicrobial efficacy which became especially relevant for complicated EC, in particular at suppuration of cysts. The proposed therapeutic tactics was used in 116 patients of the main group. 24 of them had a complicated course of the disease, 92 – uncomplicated one. After examination and preoperative preparation 112 patients were performed elective surgery; 3 patients with a rupture to the bile ducts and phenomena of obstructive jaundice were performed an emergency-delayed surgery after RPCG with EPST; 1 patient was operated on an emergency basis when EC was ruptured into the free abdominal cavity.

According to our system, in 61 (52.6 ± 4.6%) cases surgical intervention was rated as “light”, in 36 (31.0 ± 4.3%) - as “moderate-severe” and in 19 (16.4 ± 3.4%) - as "severe”. There were 131 (53.9 ± 3.2%; t = 0.235), 74 (30.5 ± 3.0%; t = 0.112) and 38 (15.6 ± 2.3%; t = 0.179) observations in the control group respectively. The absence of a statistically significant difference in the frequency of surgical interventions by their severity in clinical groups indicates the representativeness of the comparative studies.

The overall frequency of early postoperative surgical complications was 4.3%. Seroma of the postoperative wound was most often observed, the frequency of which was 1.7% (2 cases). Suppuration of the postoperative wound was noted in 1 (0.9%) patient. Bile leakage was noted in 1 (0.9%) observation. Bleeding from the abdominal cavity on the 2nd day after echinococcectomy of the liver and dissection of adhesions with recurrent echinococcosis was noted in 1 (0.9%) case. Conducted conservative hemostatic therapy was ineffective. The patient was reoperated.

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