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# ADHESIOGENESIS OF RESIDUAL LIVER CAVITIES AFTER ECHINOCOCECTOMY

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**ABSTRACT** — This paper presents findings of the retrospective analysis of 58 cases of surgical treatment in patients with hepatic hydatidosis. In all patients after open or laparoscopic echinococcectomy drainage of the residual cavities was performed. We developed and applied our own technique of obliteration of the residual cavities in all patients. Complete obliteration of the residual cavity occurred in 10–15 days after the surgery. The postoperative bed-day was 12.5. All patients recovered and were discharged in satisfactory condition.

**KEYWORDS** — echinococcosis, liver, surgery, povidone-iodine, residual cavity.

## INTRODUCTION

The hydatid form of echinococcosis is an urgent problem due to the consistently high incidence rates among the population of our country. The liver is the organ with the most frequent localization of the pathological process [1, 2, 3, 4, 5]. Currently, the most popular method of treating echinococcosis is a surgical intervention. One of the most common surgical options for treatment of echinococcosis is open echinococcectomy [6]. This operation, from the very beginning to its present numerous modifications, remains a minimally traumatic procedure. It characterizes by minimal blood loss both during the operation and after it. Echinococcectomy can also be performed laparoscopically: using modern diagnostic techniques, enabling in most cases to avoid blood transfusion and blood substitutes. Due to the fact that the cavity of the cyst can be large and gigantic in size, the healing progresses slowly with the risk of fistula formation, laparoscopic echinococcectomy is undertaken with caution.

To date, various methods of eliminating residual cavities have been proposed: from conservative to surgical. The most popular are the methods of conservative treatment of residual cavities. However, despite this diversity, none of the existing methods meet the expectations of surgeons.

*Purpose of the study:*

improving the results of surgical treatment of patients with hepatic hydatidosis

## MATERIALS AND METHODS

We analyzed the case histories of 58 patients who underwent either open or laparoscopic echinococcectomy in the Department of Surgical Diseases at Astrakhan Medical University (Russia). A technique developed by the authors for obliteration of residual cavities was used in all patients. The technique consisted of daily washing the residual cavities with a 10% povidone-iodine solution in the morning and in the evening during the bandaging of patients. Then the drainage was pinched — an exposure was created for 15 min. At the same time, in 53 (91.4%) patients the obliteration technique was applied after open echinococcectomy and in 5 patients (8.6%) — after external drainage of the residual cavity, indications for which were: intrahepatic location of single irregular echinococcal cysts; the impossibility of eliminating the residual cavity by suturing tightly, due to technical difficulties and the risk of damaging hepatic anatomical structures.

There were 1.5 times more male than female patients. Susceptibility to echinococcosis was observed in the following age groups: at the age from 41 to 50 years — 36 patients (62.1%), from 51 to 60 years — 18 patients (31%). Localization of echinococcal cysts was predominantly in the right lobe of the liver — 39 (67.2%), while in the left lobe — 19 (32.8%). The size of echinococcal cysts ranged from 10 cm in diameter — 26 (44.8%), 20 cm — 25 (43.1%), and a few cases of 30 cm in diameter — 7 (12.1%).

## RESULTS AND DISCUSSION

Open echinococcectomy was completed with drainage of the residual cavities. Two polyvinyl chloride tubes 24–27 Fr with lateral holes were installed in the residual cavities after echinococcectomy, and two drainage tubes were inserted into the subhepatic and subphrenic spaces to control hemobilia. Starting on the same day after the surgery, the technique proposed by the authors was applied. Then the drainage was pinched — an exposure was created for 15 min. No allergic reactions to the drug administration were reported. There were no cases of bleeding in the postoperative period. 9 (15.5%) patients had complications.

The procedure for introducing a 10% povidone-iodine solution was performed until the cyst cavity was completely obliterated. Obliteration of the residual cavity occurred 10–15 days after the operation. The postoperative bed-day was 12.5. All patients recovered and were discharged in a satisfactory condition. Monitoring clinical and biochemical blood parameters showed no significant changes in the red blood cells. This confirms that such operations were well tolerated by the patients and demonstrated a minimal risk of intra- and postoperative complications. Moderate leukocytosis after surgery and its decrease by day 7 indicates the anti-inflammatory and antiseptic effect of povidone iodine. Among the studied biochemical parameters, ALT, AST fluctuations attracted attention. Their values reached their maximum level on day 1 after surgery: ALT —  $1.55 \pm 0.2$  ( $p < 0.05$ ) mmol/l, AST —  $0.95 \pm 0.3$  ( $p < 0.05$ ) mmol/l. Their normalization occurred on the 7–8<sup>th</sup> day after the operation. The rest of the indicators remained within the normal range. The increase in ALT and AST indicators, in these cases, is not associated with the toxic effect of drugs, but is due to the liver surgery itself. This explains the reactive increase in transaminases. A low invasiveness of the operation facilitates the normalization of the level of transaminases.

In order to study the dynamics of obliteration of the residual cavities, fistulography, ultrasound and computed tomography of the residual cyst cavities were carried out. Fistulography was performed 7–14 days after the surgery. X-ray diffraction patterns showed a progressive decrease in the residual cavities, and by 14 days the cavity is no longer contrasted. The results of the ultrasound study of the residual cavities in the postoperative period coincide with the data of fistulography and CT studies of the residual cavities.

## CONCLUSIONS

1. The applied drug povidone-iodine 10% is an antiseptic with a wide spectrum of action.
2. Good adhesive properties of the proposed method of obliteration help to achieve effective and rapid healing of the residual cavity, which in its turn reduces the postoperative hospital stay and the period of temporary disability.
3. The developed method of obliterating residual liver cavities after echinococcectomy proved to be simple, accessible and effective and can be recommended for clinical practice.

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