

OPTIMIZATION OF SURGICAL TREATMENT OF PARASITIC AND NON-PARASITIC LIVER CYSTS

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<https://doi.org/10.5281/zenodo.11146757>

Abstract: Liver cysts, whether parasitic or non-parasitic in origin, present a significant clinical challenge requiring meticulous surgical management. This study aims to optimize the surgical treatment of both parasitic and non-parasitic liver cysts through a comprehensive analysis of surgical techniques, outcomes, and advancements in the field. Various minimally invasive approaches, including laparoscopic and robotic-assisted surgeries, have emerged as viable alternatives to traditional open surgeries, offering reduced morbidity and faster recovery. Additionally, advancements in imaging modalities, perioperative care, and patient selection criteria have contributed to improved surgical outcomes. This review synthesizes current literature, highlighting the efficacy, safety, and comparative advantages of different surgical interventions. Understanding the nuances of surgical management tailored to specific cyst types is essential for optimizing patient outcomes and minimizing postoperative complications.

Keywords: Liver cysts, Surgical treatment, Parasitic, Non-parasitic, Minimally invasive surgery, Laparoscopy, Robotic surgery, Imaging modalities, Perioperative care, Patient selection, hepatocytes, zoonotic foci, echinococcus, liver.

INTRODUCTION

The issues of surgical treatment of inguinal hernias have not been unambiguously resolved to date. Surgeons have proposed a large number of methods of surgical interventions, however, the ideal intervention has not yet been developed. The problem is urgent and needs further development and study. Material and methods. The results of treatment of 250 patients with inguinal hernias were analyzed. All operated on are men. The patients' age is from 25 to 86 years. According to the classification of Leoyd M. Nyhus (1995): direct hernias (type IIIa) were present in 111 (44.4%) patients; large oblique hernias (type IIIb) - in 74 (29.6%); recurrent hernias (type IV) were diagnosed in 65 (26%) patients. During the examination, 163 (%) patients had various comorbidities: hypertension 72 (44.2%), coronary heart disease 33 (20.2%), diabetes mellitus 21 (12.9%), bronchial asthma, pulmonary emphysema, pneumosclerosis 18 (11%), varicose veins of the lower extremities 12 (7.4%), previous CVA 7 (4.3%). Of 74 patients with recurrent and hernias, 23 had a second, 9 had a third relapse. Results. During the operation, local infiltrative anesthesia was used in 174 (69.6%) patients for anesthesia, epidural anesthesia was used in 60 (24%) cases, general anesthesia occurred in 16 (6.4%) patients. During the operation, we attach particular importance to minimal tissue trauma and hemostasis. Postoperative complications: in 26 (10.4%) cases, there was a slight scrotal edema, which completely disappeared within 1014 days after the operation. The occurrence of this complication is associated with compression of the spermatic cord into the hole created in the mesh implant; in 13 (5.2%) patients who were operated on for recurrent hernias, in the postoperative period and during the control examinations, there were areas of sensitivity disturbance in the operation area, which we associate with trauma to the nerve trunks during dissection of scar tissue. Conservative treatment after surgery included antibiotic therapy, pain relief, prevention of thromboembolic complications. There were no lethal outcomes. Long-

term results by telephone survey were studied in the period up to 5 years after surgery, in 102 (40.8%) patients, recurrent hernias were not observed. The patients are feeling well. Findings. Thus, hernia repair according to the Liechtenstein technique using a polypropylene mesh is the operation of choice in patients with straight (type IIIa), large oblique (type IIIb), recurrent hernias (type IV). Strict adherence to the operating technique, high-quality hemostasis, full-fledged conservative therapy allows avoiding the development of complications at various stages of treatment.

Relevance. Despite the rapid development of medicine, due to the development and mass introduction into clinical practice of new medical technologies and modern equipment, the issues of diagnosis and surgical treatment of non-parasitic liver cysts remain one of the pressing and unresolved problems of modern hepatosurgery.

Even in the works of Hippocrates, there is evidence of cystic liver disease of a parasitic nature, however, Bristow was the first to describe a case of a non-parasitic liver cyst in 1856, noting its connection with polycystic kidney disease. In the same year, Michel reported for the first time a solitary nonparasitic liver cyst.

For a long time, non-parasitic liver cysts remained a finding on the operating or section table. The introduction of ultrasound and CT into clinical practice has changed the understanding of the frequency of occurrence of this pathology.

According to modern concepts, the frequency of occurrence of this nosology is 0.15-1.86% of the overall structure of liver morbidity, which gave an idea of the nature of cysts, their size, location, quantity, relationship to the vessels and ducts of the liver, relationship with neighboring organs and tissues .

Data on surgical interventions for non-parasitic liver cysts appeared in the literature in 1913; 34 operations were described, and in 1923 the number of operations for liver cysts was already 104.

However, the problem still remained poorly understood and all operations were predominantly emergency in nature, resulting from late diagnosis.

The accumulation of clinical material and analysis of clinical data contributed to a further in-depth study of the disease, the search for new solutions to many issues in the diagnosis and treatment of non-parasitic liver cysts, and options for the classification of NPC appeared.

The purpose of the study is to improve the results of diagnosis and surgical treatment of patients with parasitic and non-parasitic liver cysts based on the use of diapaetic methods.

MATERIALS AND METHODS OF RESEARCH

Starting in 2016, we began to use puncture-drainage methods of cystectomy, known as PAIR (Punction-Aspiration-Injection-Reaspiration percutaneous puncture treatment method) and PEVAC (Percutaneos-Evacuation of cyst contents percutaneous puncture evacuation and cavity drainage method). Percutaneous puncture and sclerotherapy of non-parasitic liver cysts under ultrasound guidance was performed in 39 patients. A total of 6 (15.4%) men and 33 (84.6%) women with serous liver cysts from 4 to 15 cm in diameter were operated on. Solitary cysts, localized in the vast majority of cases in the right lobe of the liver, were diagnosed in 4 (10.2%) men and 17 (43.6%) women; multiple cysts were diagnosed in 2 (5.1%) men and 25 (25, respectively). 64.1%) patients.

Percutaneous puncture and sclerosis of liver cysts under ultrasound control were considered indicated in the presence of solitary and multiple true non-parasitic liver cysts measuring 5 cm or more in diameter in the presence of contraindications to laparoscopic

operations. Echosonographically, true cysts were round or oval cavities limited by a thin wall (0.1 - 0.2 cm) without echogenicity of the internal space with clear, even contours and the presence of a clearly visible posterior wall, the absence of internal reflections and a characteristic increase in echo signals directly behind cystic formation. In the presence of an intraluminal septum of the cyst, a characteristic spotty pattern was visualized. Intraluminal echo signals indicated hemorrhage into the cyst cavity or its infection.

Percutaneous puncture was also performed in patients with severe concomitant pathology, who were contraindicated for operations through laparotomy access.

We applied this technique to 13 (25.0%) patients of the main group. All interventions were performed in a specialized operating room equipped with standard operating equipment, as well as an ultrasound machine and an X-ray telescopic unit. The entire operating room and anesthesia team used X-ray protective aprons and collars as radiation protection. The operation was performed under intravenous anesthesia with the patient lying on his back. Before the operation, the patient underwent a polypositional ultrasound examination to determine a safe access trajectory. The trajectory was chosen in such a way that there were no blood vessels, bile ducts, hollow organs, or pleural sinus in the path of the needle. Also important was the presence of a layer of liver parenchyma above the cyst at the point where the instrument entered it. With a partially extraparenchymal location of the cyst, the entrance to it through a free edge not covered by liver parenchyma carries the danger of leakage of hydatid fluid into the abdominal cavity and an increased risk of relapse. Access also depended on the location of the cyst. Thus, when the cyst was located in the left lobe, the injection was carried out in the epigastric region, when the cyst was located in the right lobe, access was carried out in the right hypochondrium, and the location of the cyst in the posterior segments of the right lobe dictated the need for intercostal access. Moreover, each access carries its own dangers.

Dangers of access in the epigastric region:

- risk of damage to a hollow organ (stomach);
- risk of cyst rupture due to greater mobility of the left lobe.

With a subcostal approach, there is a high risk of damage to large vessels and bile ducts.

Intercostal access carries the following risks:

- damage to intercostal vessels
- passage of instruments through the pleural sinus

After selecting the optimal trajectory, an incision of several millimeters was made at the site of the intended injection with a scalpel, and the soft tissue was pulled apart to the peritoneum using a mosquito clamp. Next, a special attachment was put on the ultrasound sensor, which sets the direction of the needle. A needle-catheter complex with a diameter of 7-8.5Fr was fixed in the nozzle. In rare cases, in the absence of direct safe access, we used the "free hand" technique, which allows you to change the tool path and bypass various structures along the tool path. We used this technique in 3 patients (23.1%). The use of this technique can lead to significant trauma to the liver tissue by changing the trajectory of the complex inside the liver parenchyma. The risk of damage to small vascular structures of the liver also increases, which can sometimes lead to the formation of small intraparenchymal hematomas. Therefore, we believe that this technique should be used according to strict indications and should not become a routine way of performing the operation.

Under constant ultrasound control, the complex was introduced into the cyst using a bayonet-like movement. Then the mandrel with the stylet was removed from the complex, and the drainage was fixed in the cyst cavity in the form of a “pig tail”

RESULTS AND DISCUSSION OF THE WORK

The fundamental point of the problem being developed was the sharp limitation of indications for open interventions through laparotomic access due to their high traumatic nature, unsatisfactory immediate and long-term results, as well as due to the rapid development of medical imaging methods and the introduction of minimally invasive technologies into surgical practice.

When determining the indications for surgical treatment, it was assumed that patients with true uncomplicated liver cysts measuring up to 5 cm in diameter were subject to dynamic observation. According to the literature, such cysts do not cause atrophic changes in the liver parenchyma surrounding the cyst and do not affect the functional state of the organ. The use of ultrasonography in color Doppler mode helped to verify true uncomplicated cysts.

The complete absence of blood flow in the thickness of the cyst wall was an important differential diagnostic sign in relation to complicated cysts and other focal liver diseases. In some cases, when performing color Doppler ultrasound, weakly expressed signals were noted both in the area of the cyst walls and in its cavity, however, with true liver cysts, these signals were artifacts and quickly disappeared when the study parameters were changed.

The main complaints were pain, discomfort in the right hypochondrium or epigastrium, and an increase in the size of the abdomen. In patients with polycystic disease, the predominant complaints were heaviness, pain, a feeling of fullness, and in the area of the right hypochondrium and epigastrium.

The main puncture method of treatment in the studied patients was percutaneous puncture and sclerosis of liver cysts, which was performed in 31 (79.5%) patients. We used 96% alcohol as a sclerosing agent, introducing it into the cyst cavity in a volume of 40-45% of the amount of evacuated fluid. For large cysts, instillation of 40-60 ml of alcohol was performed to prevent intoxication. The exposure lasted 5 minutes, while the patient was asked to change his body position several times to increase the contact of the inner lining of the cyst with the sclerosant, after which a full evacuation of the contents of the cyst was repeated, followed by removal of the needle. It should be noted that most authors also suggest using 96% alcohol in combination with iodine as a sclerosant.

CONCLUSION

Analysis of percutaneous puncture methods of surgical operations has revealed wide possibilities for treatment and diagnostic tactics for managing patients with liver cysts, which allows, in most cases, to perform surgical intervention in conditions more favorable for the patient. Patients with non-parasitic solitary cysts or a dominant cyst in polycystic disease up to 5 cm in diameter require dynamic monitoring. The indications for puncture cystectomies are non-parasitic solitary and multiple liver cysts measuring 5 cm or more. We consider the localization of cysts on the posterior surface of the liver, as well as intraparenchymal location, to be contraindications. Indications for puncture echinococectomy are solitary and multiple cysts with a diameter of no more than 7 cm, located in acceptable zones, at stage CE1 according to the WHO classification (2003). Contraindications to the use of this technique are disseminated and complicated forms of echinococcosis.

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