Central Asian Journal of Medicine

Volume 2019 | Issue 3 Article 2

9-24-2019

The Efficiency of Minimally Invasive Surgery for Hard-To-Reach Hydatid Cysts of The Liver

O.R. Teshaev
Tashkent Medical Academy, Tashkent, 100109, Uzbekistan, tma.tor@mail.ru

I.B. Khaitov
Tashkent Medical Academy, Tashkent, 100109, Uzbekistan, ilhom.med79@mail.ru

G.V. Yarovenko
Samara State Medical University, Samara, 443099, Russia, erovenko_elena@mail.ru

Central Asian Journal of Medicine

The Efficiency of Minimally Invasive Surgery for Hard-To-Reach Hydatid Cysts of The Liver

Teshaev O.R.[a], Khaitov I.B.[a], Yarovenko G.V.[b]

[a] ***Tashkent Medical Academy***
[b] ***Samara State Medical University***

Article info

Published: september 2019 y

Key words: *echinococcosis, liver echinococcosis, echinococcectomy, surgical treatment liver echinococcus, percutaneous puncture and drainage.*

ABSTRACT

To improve the results of surgical treatment for hard-to-reach echinococcal cysts of the liver through the use of minimally invasive methods. ***Material and methods:*** *From 2013 to 2018, 303 patients with echinococcal cysts located in the VII-VIII segments of the liver were surgically treated at the planned surgery department of the city clinic No. 1 (Tashkent, Uzbekistan). With respect to the methods of surgical treatment, these patients were divided into two groups: the first group consisted of 159 patients in whom echinococcal cysts up to 7 cm diameter located intrahepatically in the VII-VIII segments were punctured; The second group comprised of 144 patients in whom there were echinococcal cysts more than 7 cm diameter, located along the edge of the liver in the VII-VIII segments, were performed a video-assisted minimally invasive thoraco-phreno-laparotomy with an incision up to 7 cm length.* ***Results:*** *Minimally invasive interventions for liver echinococcosis, which include cyst puncture under the ultrasound control and video-assisted minimally invasive thoraco-phreno-laparotomy, have an extremely significant advantage over conventional surgeries: low trauma, reduction in the number of postoperative complications and patient treatment costs associated with it. However, proper patient selection should be strictly individualized and reasonable in terms of this treatment method.* ***Conclusions:*** *puncture-aspiration echinococcectomy is a relatively safe intervention in patients with uncomplicated cysts in the VII-VIII liver segments with a size up to 7 cm. The application of the method facilitates to reduce the number of postoperative complications. The obtained results allow us to consider this surgical technique as a radical intervention in hepatic hydatid echinococcosis. Undoubtedly, the use of the video-assisted minimally invasive thoraco-phreno-laparotomy is an effective method in patients with a large marginal in the VII-VIII segments of the liver placed echinococcal cyst.*

Liver echinococcosis, also known as a serious hydatid disease, an infection of larval stage echinococcus tapeworm - *Echinococcus granulosus* with a worldwide distribution and is a complex neglected disease, causing a serious medical, social issue and economic loss for a number, including highly developed, world countries [1.10]. Uzbekistan is considered as a geographic temperate endemic zone for echinococcosis. In Uzbekistan, it was assessed by the appeal for medical care that the prevalence of echinococcosis is 5.82 per 100 thousand people and has a steady upward trend [8].

Echinococcosis of the liver is a serious, core issue of surgical hepatology [2]. Despite the benign nature, liver echinococcosis remains a leading role among the whole parasitic diseases regarding the number of complicated forms that require surgical intervention [3]. Postoperative complications occur in 5-31,7% of patients with hydatid liver echinococcosis. Bile leakage and suppuration of the residual cavity are most often observed complications. Mortality in the surgical treatment of patients with echinococcosis, even in clinics with a significant experience, reaches 3,1-8,6% [12].

Currently, percutaneous puncture-drainage treatment of parasitic cysts with ultrasound or CT with pre- and postoperative chemotherapy, as well as new technologies for the video-assisted surgery, are significantly evolving. A feature of the modern stage of echinococcosis surgery is the endeavor to use minimally invasive surgery techniques, which include percutaneous puncture and drainage of echinococcal cysts under ultrasound control [5,9].

Basing on the results from the experience of about 2,000 transdermal interventions, in 1997, the WHO expert group on echinococcosis (WHO-IWGE) presented the PAIR (Puncture, Aspiration, Injection, Re-aspiration) protocol at the International Congress on Hydatidology in Lisbon. This guideline for transdermally minimally invasive treatment of liver echinococcosis, including indications, contraindications and a step-by-step procedure, was accomplished in 1999. Since then, the PAIR method, which was officially approved by WHO, has been used everywhere in this category of patients. According to world data, currently minimally invasive interventions are used in almost a third of patients with echinococcosis. At the same time, it is obvious that an analysis of the experience gained in the surgical treatment of liver echicococcosis and the further search and improvement of surgical treatment for this category of patients are required [4,6]

Purpose of the study

To improve the results of surgical treatment of hard-to-reach echinococcal liver cysts due to the usage of minimally invasive methods.

Material and methods

In the period from 2013 to 2018, 303 patients with echinococcal cysts located in the VII-VIII segments of the liver were hospitalized in the planned surgery department of the city clinic No. 1 in Tashkent. At the time of admission, a general analysis of blood and urine, biochemical analyzes to determine the functional state of the liver, ECG were performed. The main diagnostic method was ultrasound investigation, which was performed before the operation, in the postoperative period and upon discharge of patients from the hospital. Multispiral computed tomography (MSCT) and magnetic resonance imaging (MRI) were performed in doubtful cases. The age of patients ranged from 20 to 71 years, the average age was 38,4 ± 1,6 years. 162 (53,5%) patients were female, 141 (46,5%) male.

Referring to the method of surgical treatment, patients were divided into two groups. The first group consisted of 159 patients with echinococcal cysts up to 7 cm in size, located intrahepatically in the VII-VIII segments intrahepatically in the VII-VIII segments were punctured. The second group included 144 patients with echinococcal cysts larger than 7 cm in size, located along the edge of the liver in segments VII-VIII, wherein the video-assisted minimally invasive thoraco-phreno-laparotomy with an incision up to 7 cm length were performed.

Results and discussion

In 202 (66,3%) patients, primary echinococcosis of the liver was diagnosed, in 102 (33,66%) - recurrent. The choice of surgical approach was largely dependent on the

location and size of the cysts. Most often, cysts invaded the VII-VIII segments of liver, which significantly complicated the choice of optimal surgical approach and the implementation of all stages of echinococcectomy. This is due to the fact that the branches of the portal vein going to the VII and VIII segments are a continuation of the main trunk and carry away the main flow of the germinal elements of the parasite. Moreover, the blood flow in them due to the distance from the porta hepatis is significantly lower than in the segments adjacent to the porta, which also contributes to a greater "subsidence" of the germinal elements in these segments [7].

In this regard, a core problem of conventional interventions is the surgical treatment of subphrenic echinococcosis of the liver, which has a number of features and is the most complex in terms of surgical techniques [11]. This is due to the fact that, although there is a good deal in common in the surgical treatment of liver echinococcosis of various locations, including a subphrenic placement of cysts, the choice of operative approach and the surgical techniques is still arduous. Owing to this localization and late diagnosis, only large and giant cysts are more often found. A general experience shows that the localization of echinococcal cysts on the diaphragmatic and posterior surfaces of the liver is the most inconvenient with respect to approach, and it is often technically hard to perform when using conventional surgical approaches. Therefore, the video-assisted thoraco-phreno-laparotomy was carried out in patients of the second group, with localization of large echinococcal cysts in the 7-8 segments involving the diaphragm. Of those, 82 patients were performed a total pericystectomy, in 15 - a subtotal pericystectomy, in 45 - an echinococcectomy without removing the fibrous capsule, in 2 patients a liver resection was performed, the indications of which served as the marginal location of the parasite, as well as cases where other methods of operation could not provide a positive effect.

Upon admission, much attention was concentrated to preoperative preparation, especially for debilitated patients. It was a short-term (no more than 3-4 days) conduction of the infusion therapy with the mandatory inclusion of hepatotropic drugs. Besides, during this period, an additional examination was performed in order to clarify the diagnosis or identify the nature of the concomitant disease. All patients of the second group were operated under endotracheal analgesia.

70% ethanol with an exposure of 5 minutes and an alcohol solution of iodine with an exposure of 10 minutes were utilized for the curative management of echinococcal cysts.

The cavity of the fibrous capsule was eliminated in various ways (capitulation according to Delba, invagination, pericystectomy), after echinococcectomy had been fulfilled.

Particular attention was directed to assessing the severity of the postoperative period with the control of ultrasound of the chest and abdominal cavities. The postoperative period in most of our patients was satisfactory, but 21 (14,58%) had complications: purulence of the residual cavity was detected in 7 patients, that of bile duct- in 5, subphrenic abscess- in 2, obstructive jaundice- in 1, allergic reaction -in 1, bleeding - in 1. So, in 2 patients, prior to discharge from the hospital, a residual cavity of small sizes was found that did not contain liquid, so they were discharged under a surveillance of the surgeon in the clinic at the place of residence. Partial purulence of the postoperative wound occurred in 2 patients during the hospital stay, which required additional antibiotics and local treatment according to the protocol for infected wounds. This

complication, as a rule, arose from the subdiaphragmatic localization of cysts, when the detachment of a cyst from the adhesions inevitably causes trauma to the diaphragm.

The length of hospital stay in patients of the first group was 4,6 ± 3.2 days. For this group of patients, puncture-aspiration echinococcectomy was performed under ultrasound control, of those, 38 patients were inserted drainage for the residual cavity. The age of patients ranged from 16 to 72 years. There were 70 males (45,75%), 89 females (55,97%). The sizes of echinococcal cysts varied from 5 to 7 cm in diameter. An intrahepatic location of echinococcal cyst was observed in 118 (74,2%) patients.

Single echinococcal cysts 7 cm in size, located in the thickness of the parenchyma, and a high operational and anesthetic risk were considered as indications for the puncture-aspiration method of management. Surgical interventions under ultrasound control were performed under local anesthesia. An ultrasound apparatus, as well as a set of special needles were used in order to conduct the puncture interventions. Cyst cavities were drained according to the Seldinger technique, and a large stylet catheter was applied for large cysts. Puncture interventions were performed through the liver tissue to prevent possible seeding of the abdominal cavity. Upon getting into the cavity of the echinococcal cyst, the puncture needle was removed, drainage was established by the Seldinger technique. The maximum possible evacuation of the contents of the cyst was performed through the catheter. Afterwards, the cavity was rinsed with a 70% solution of ethyl alcohol. After a 10-minute exposure, re-aspiration of the injected fluid was performed. Fragments of the devitalized shells of the parasite were removed by active aspiration using the lavage method. There were no complications associated with puncture.

Treatment control was carried out immediately, after manipulation using fistulography and ultrasound of the liver to identify cystobiliary fistula and 1,5-2 months after puncture and drainage. Obliteration and sclerotherapy of cysts were considered some criteria for the effectiveness of treatment.

In the postoperative period, 1 (0,63%) patient with a puncture intervention developed an allergic reaction, which was stopped by desensibilization therapy. In 5 patients, purulence of the residual cavity was identified. There were no other complications of puncture treatment of echinococcal cysts. There were no fatal outcomes in this group. Drainage was removed after cleansing the cyst cavity from the remnants of the chitin membrane and termination of effusion. Patients were discharged with a catheter and were on an outpatient surveillance, regularly, underwent ultrasound examination. Catheters were removed in all patients on the 25-30th day after percutaneous puncture echinococcectomy. The average hospital stay for patients with percutaneous interventions was 12,0 ± 1,1 days.

A satisfactory long-term result was obtained in all patients of this group at up to 3 years of follow-up. There were no recurrent cases. A control ultrasound demonstrated a complete obliteration of the cyst in 124 (77%) patients, and minor residual cavities in 35 (22%). While adopting this method of treatment for liver echinococcosis into the clinical practice, we made sure that its use is inappropriate in the presence of multiple parasitic cysts. A decayed echinococcosis is also considered as a contraindication to the use of the puncture method, since it is almost impossible to completely remove the thick, viscous contents in this case.

Conclusion

Minimally invasive interventions for liver echinococcosis, which include cyst puncture under the ultrasound control and video-assisted minimally invasive thoraco-

phreno-laparotomy, have an extremely significant advantage over conventional surgeries: low trauma, reduction in the number of postoperative complications and patient treatment costs associated with it. However, proper patient selection should be strictly individualized and reasonable in terms of this treatment method.

Findings

1. Puncture-aspiration echinococcectomy is a relatively safe operative technique in patients with uncomplicated cysts with up to 7 cm diameter, located intraparenchymally in the VII-VIII segments of the liver.

2. The application of the method facilitates to reduce the number of postoperative complications, and the obtained results allow us to consider it a radical intervention in hydatid liver echinococcosis.

3. The application of the video-assisted minimally invasive thoraco-phreno-laparotomy is effective in patients with a large sized edge placed echinococcal cysts in the VII-VIII segments of the liver.

References

1. Akilov Kh.A., Ortikov B.Ya., Akbarov I.M. Diagnosis and surgical treatment of echinococcosis of rare localizations // Surgery of Uzbekistan. 2008;3: 7-10.

2. Vetshev P.S., Musaev G.Kh., Bruslik S.V. Echinococcosis: the current state of the problem // Ukrainian Journal. Chir. 2013;3: 196-201.

3. Vishnevsky V.A., Kakharov M.A., Kamolov M.M. Radical surgery for liver echinococcosis // Actual issues of surgical hepatology: Sat. thesis. 12th International congress of hepatologists of the CIS countries. - Tashkent, 2005; 106.

4. Vetshev P.S., Musaev G.Kh. Echinococcosis: the current state of the problem // Annals chir. hepatol. 2006;11: 111–117.

5. Vetshev P.S., Musaev G.Kh., Bruslik S.V. Echinococcosis: the current state of the problem // Ukrainian Journal. chir. 2013;3: 196-201.

6. Resolution of the 22nd International Congress of the Association of Hepatopancreatobiliary Surgery of the CIS countries “Actual problems of hepatopancreatobiliary surgery” // Annals chir. hepatol. 2015;20(4): 128-131.

7. Sergiev V.P., Legonkov Yu.A., Poletaeva O.G., et al. Cystic echinococcosis (single chamber): clinical feature, diagnosis, treatment, prevention. - M .: Vectorbest, 2008; 36.

8. Nazyrov F.G., Devyatov A.V., Akbarov M.M., et al. Chemotherapy and problems of recurrent echinococcosis of the liver // Annals chir. hepatol. 2011;16(4): 19-24.

9. Shamsiev AM, Yusupov Sh.A., Kurbaniyazov Z.B., Rakhmanov KE. Improving the diagnosis and treatment of various morphological forms of echinococcosis of the liver // Zdobutki clinical and experimental medicine. 2016;1: 85-90.

10. Shamsiev Zh.A., Rakhmanov K.E., Davlatov S.S. Optimization of the methods of surgical treatment of liver echinococcosis // Med. journal of Uzbekistan. 2016;1: 45-48.

11. Yagc I.G., Ustunsoz B., Kaymakcioglu N., et al. Results of surgical, laparoscopic, and percutaneous treatment for hydatid disease of the liver: A 10-year experience with 355 patients // World J. Surg. 2005;29(12): 1670-1679.

12. Prousalidis J., Tzardinoglou E., Kosmidis C., et al. Surgical management of calcified hydatidcystsof the liver // Hepatopancreatobil. Surg. 1999;11: 253-259.