ABSTRACT

Objective: Cystic echinococcosis (CE) is a disease that is endemic in our country and is caused by the contamination of eggs of the parasite Echinococcus granulosus. Although elective surgeries can not be performed in certain periods during the pandemic period in our clinic, as in the whole country, from the date of the appearance of the Coronavirus Disease (COVID-19), it was aimed to examine the surgical and interventional procedures applied in the last 3 years and their results.

Materials and Methods: Twenty-four patients admitted to our clinic with the diagnosis of CE disease between 2019 and 2021 were retrospectively analyzed in terms of demographic, clinical, operative and post-operative follow-ups.

Results: Twelve of the patients were male and 12 were female. The mean age of the patients was 43.8 years (18-99 year). There were CE lesions in the right lobe in 15 patients, in the left lobe in 2, and in both lobes in 4 patients. Lesions compatible with type 3 hydatid cysts were mostly observed in the patients. 4 patients had more than one hydatid cyst in the liver. The mean cyst diameter was 11,5 cm (5-22cm) in the examination performed considering the largest cyst diameter of patients with multiple cystic lesions. The cyst was infected in 4 patients. In 1 patient, the liver cyst ruptured and was operated under emergency conditions. In the operation, cholecystectomy was performed in 5 patients and splenectomy was performed in 1 patient simultaneously. Intraoperative primary repair was performed in a total of 4 patients with intra-cyst biliary fistula. In the post operative period, intracystic abscess developed in 4 patients and percutaneous abscess drainage was performed. Concurrent appendiceal mucocele was present in 1 patient and appendectomy was added to the procedure. The mean hospital stay of the patients was 9.5 days (2-19 days). Mortality was not observed.

Conclusion: As a result of delayed elective surgery in CE disease during the pandemic, cysts were encountered in complicated and advanced stages, which increased the number of hospitalizations and additional procedures to be performed.

Keywords: Liver cystic echinococcosis, percutaneous treatment, surgical treatment, laparoscopic surgery, COVID-19
INTRODUCTION

Cystic echinococcosis (CE) is a disease that is endemic in our country and is caused by the contamination of eggs of the parasite *Echinococcus granulosus* (1). Although the disease is frequently seen in the Southeastern and Eastern Anatolia regions of our country, it continues to be an important health problem with its economic and public health dimensions (2). Cystic echinococcosis can affect almost all organs in the body, but it usually settles in the liver at a rate of 50-70%. The cyst is usually located in the right lobe of the liver and is single in 70-80% (2). The second most common organ is the lung with a rate of 20-30%, and it is seen less frequently in the spleen, kidney, heart, bone, central nervous system and other organs (3,4). Because CE grows very slowly, they remain asymptomatic for years. The preliminary diagnosis is usually made as a result of radiological examinations performed for other reasons. Right upper quadrant pain, jaundice, nausea, vomiting and abnormal liver function tests may be observed in symptomatic cases. Medical treatment (albendazole), percutaneous drainage and surgery are current treatment options in liver CE disease. In complicated cysts, surgery is still the best option (5-11). The aim of surgical treatment is to eliminate the scolexes, remove all viable elements of the cyst, and obliterate the remaining cavity (12). Since most of the surgeries are performed by general surgeons who are not experts in the field of liver-biliary duct surgery, conservative methods are preferred more frequently (13-16). Coronavirus Disease (COVID-19) is a disease that first developed in late December in China’s Wuhan Province, with respiratory symptoms (fever, cough, shortness of breath) (17). Although elective surgeries cannot be performed in certain periods during the pandemic period in our clinic, it was aimed to examine the surgical and interventional procedures and their results in patients diagnosed with liver CE from the beginning of the pandemic until now.

MATERIALS AND METHODS

Ethics committee approval was obtained from Antalya training and research hospital with the protocol number 17/3 dated 08/09/2022. The files of 24 hydatid cyst patients who underwent surgical or interventional procedures in the general surgery clinic of Antalya Training and Research Hospital between 2019-2021 were retrospectively analyzed. The cases were evaluated in terms of age, gender, existing symptoms, radiological findings, laboratory results, cyst locations, cyst type, types of surgery, medical treatment, post-operative follow-up of the patients (complications, recurrences) and hospital stay. All patients except emergencies were treated with albendazole (10 mg/kg/day) for 2 weeks before the operation and they were taken into the operation. Albendazole treatment was continued for 3 months in the post-operative period. Data collected were calculated with SPSS (16 for Windows, SPSS Inc., Chicago, Illinois, USA).

RESULTS

Four patients had more than one hydatid cyst in the liver. Laparoscopic partial cystectomy was performed in 3 of the patients, and in 1 case, the opening was performed due to difficulty in reaching the cyst. WhilePAIR (Puncture, aspiration, injection, re-aspiration) method was applied to 2 patients, partial cystectomy by laparotomy and total excision in some cases were applied to other patients. Omentopexy was added to 7 patients. Partial cystectomy and omentopexy were performed after recurrence was observed in one patient who underwent Pair. Lesions compatible with type 3 hydatid cysts were mostly observed in the patients. The cyst was infected in 4 patients. In 1 patient, the liver cyst was ruptured and operated under emergency conditions. Emergency surgery was performed in 1 patient due to the rupture of the lung cyst associated with the liver cyst. 5 patients were previously operated with the diagnosis of hydatid cyst. In the operation, cholecystectomy was performed in 5 patients and splenectomy in 1 patient simultaneously. Intraoperative primary repair was performed with 2/0 or 3/0 propylene or absorbable suture material in a total of 4 patients with intra-cyst biliary fistula, 3 in the right lobe and 1 in the left lobe. Three of these 4 patients required endoscopic sphincterotomy (ES) with Endoscopic Retrograde Cholangiopancreatography (ERCP) due to the persistence of bile leakage in the postoperative period. In the post-operative period, intraoperative undetected bile leakage was observed in 3 patients. These patients were also treated with ERCP and ES. Pre-op ERCP and ES were performed in 1 patient due to hydatid cyst associated with bile ducts. In the postoperative period, intracystic abscess developed in 4 patients and percutaneous abscess drainage was performed. Concurrent appendiceal mucocele was present in 1 patient and appendectomy was added to the procedure. The mean hospital stay of the patients was 9.5 days (2-19 days). Post operative pleural effusion was observed in 2 patients. No mortality was observed.

DISCUSSION

Hydatid cyst is the larval form of the parasitic infection caused by the *Echinococcus granulosus*, which causes endemic diseases all over the world (18,19). The frequency of the disease was found to be 1.05% in our country, and approximately 2000 new cases are detected each year (20,21). Cystic echinococcosis is most frequently observed in the liver (18).

The diagnosis of CE is made by radiological methods (USG, CT, MRI). Following the USG classification developed
by Gharbi et al. (22) in 1981, the World Health Organization Informal Echinococcus Working Group (WHO-IWGE) developed the universally applicable international standardized USG classification in 1994 (23). We used this classification in our study. Half of the patients presented with Type 3 hydatid cyst.

There are basically four treatment options: surgery, percutaneous technique, antiparasitic medical treatment and follow-up (wait and see) (20). Among them, PAIR or laparoscopic surgery are effective methods that can be used safely in experienced hands in suitable patients, since they are less invasive during the pandemic period.

Before any intervention in the treatment of Cystic echinococcosis, the lesion should be evaluated radiologically, staged, and the most appropriate approach is to start patient-specific treatment planning by providing clinical and laboratory correlation (24). Albendazole is an important aid in preventing unintentional spread during surgery and percutaneous procedures (25,26). In our clinic, albendazole treatment was started for all patients 2 weeks before the surgery or percutaneous procedure, and it was observed that medical treatment was continued for at least 3 months after the procedure.

Although open surgery was the only treatment method in the past, it is still the main treatment method especially for complicated hydatid disease (9). During the pandemic period, laparotomy and partial cystectomy became the most preferred treatment method, as patients were admitted with complicated and advanced hydatid disease. While 12 patients had type 3 cysts, 4 patients had abscess due to infection of the cyst.

In the surgical treatment, 20% NaCl or betadine was used as a scolicidal agent.

The most common complication of liver hydatid cyst is cystobiliary intercourse or intrabiliary rupture, which is observed at a rate of 5-25% (27-33). In our study, intraoperative biliary involvement was detected in 4 patients and preoperative biliary involvement in 1 patient, while bile leakage was observed in 3 patients, which was not noticed during the operation and was detected in the postoperative period. The ERCP and ES procedure was applied to our patients whose post-operative biliary fistula continued.

Infection of the cyst contents with pyogenic microorganisms is another complication that may be encountered. It is treated with drainage of the abscess and appropriate antibiotics (34). Intraoperative abscess was accompanying in 4 patients. In the post-operative period, abscess developed in 4 cases and was treated with percutaneous drainage and antibiotic administration.

The most important cause of anaphylaxis, which is the most dangerous complication, is the mixing of cyst fluid into the circulation (23). No anaphylaxis or death was observed in our clinic.

**CONCLUSION**

Despite the advances in diagnosis and treatment in recent years, Cystic echinococcosis, which still cannot be eradicated, is endemic in our country and causes a public health problem, disrupts human and animal health and causes economic losses.

Basically, there are four treatment options, and the most appropriate treatment is chosen according to the cyst size and number, localization, cystobiliary relationship, cyst structure, and the availability of an experienced surgeon and an experienced radiologist.

As a result, due to the postponement of elective surgery in Cystic echinococcosis during the pandemic period, encountering cysts in complicated and advanced stages has increased the number of hospitalizations and additional procedures to be performed.

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