

OUR EXPERIENCE IN THE TREATMENT OF RESIDUAL CAVITY OF THE LIVER CYSTIC ECHINOCOCCOSIS (CASE REPORT)**H. Harutyunyan¹, A.A. Harutyunyan², A. Voskanyan³,****H. Barseghyan¹, A.S. Chopikyan², A.E. Tadevosyan²**

Yerevan State Medical University

¹Department of General Surgery²Department of Public Health and Healthcare Organization³Department of Endoscopic and Endocrine Surgery

Yerevan, Armenia

Summary. Cystic echinococcosis (CE) caused by *Echinococcus granulosus* is a parasitic infection affecting various organs, with hepatic cystic echinococcosis being prevalent in up to 75% of CE cases. While more common in less developed nations, hepatic CE poses clinical management challenges globally. Treatment modalities encompass both medical and surgical interventions. Endocystectomy offers a conservative surgical approach to hepatic CE, avoiding extensive liver resection.

The management of residual cavities post-surgery involves a combination of medical therapy and surgical intervention. Albendazole serves as the primary medical treatment, administered pre- and post-operatively to reduce parasite viability. Surgical options include percutaneous techniques such as PAIR and surgical resection, aiming for complete cyst removal while preserving hepatic function. Management of cyst-biliary fistula is crucial to address biliary complications.

Long-term follow-up is essential to monitor treatment response and detect recurrence. Postoperative complications, including biliary leakage and residual cavity infections, require vigilant management. Symptomatic residual cavities can manifest with fever and jaundice due to infection or biliary communication.

A case presentation underscores the challenges in managing residual cavities post-hepatic cystic echinococcosis surgery. Percutaneous intrahepatic drainage, guided by imaging, followed by alcohol ablation, effectively controlled bile flow and promoted cavity healing.

In conclusion, percutaneous intrahepatic drainage remains a key strategy for managing residual echinococcal cavities, with alcohol ablation as adjunctive therapy to halt bile flow and expedite cavity resolution.

Key words: residual cavity, cystic echinococcosis, surgical treatment, percutaneous drainage, alcohol ablation.

НАШ ОПЫТ ЛЕЧЕНИЯ ОСТАТОЧНОЙ ПОЛОСТИ КИСТОЗНОГО ЭХИНОКОККОЗА ПЕЧЕНИ**А. Арутюнян¹, А.А. Арутюнян², А. Восканян³,****А. Барсегян¹, А. Чопикян², А.Е. Тадевосян²**

Ереванский государственный медицинский университет

¹Кафедра клинико-лабораторной диагностики²Кафедра общественного здоровья и организации здравоохранения³Кафедра эндоскопической и эндокринной хирургии

г. Ереван, Армения

Резюме. Кистозный эхинококкоз (КЭ), вызванный *Echinococcus granulosus*, представляет собой паразитарное заболевание, затрагивающее различные органы, причем печеночный кистозный эхинококкоз встречается вплоть до 75% случаев КЭ. В то время как это более распространено в менее развитых странах, печеночный КЭ представляет собой клиническую

проблему в мировом масштабе. Методы лечения включают как медикаментозные, так и хирургические воздействия. Эндоцистэктомия предлагает консервативный хирургический подход к печеночному КЭ, избегая обширной резекции печени. Управление остаточными полостями после хирургии включает в себя комбинацию медикаментозной терапии и хирургического вмешательства. Альбендазол служит основным медикаментозным лечением, назначаемым до и после операции для снижения жизнеспособности паразитов. Хирургические варианты включают в себя перкутанные методики, такие как PAIR, и хирургическую резекцию с целью полного удаления кисты при сохранении функции печени. Управление кисто-желчными свищами имеет решающее значение для решения желчных осложнений. Долгосрочное наблюдение необходимо для отслеживания ответа на лечение и выявления рецидивов. Послеоперационные осложнения, включая желчные выделения и инфекции остаточной полости, требуют внимательного ведения. Симптоматичные остаточные полости могут проявляться лихорадкой и желтухой из-за инфекции или желчной коммуникации. Пример клинического случая подчеркивает трудности в управлении остаточными полостями после хирургии по поводу печеночного кистозного эхинококкоза. Перкутанное внутрипеченочное дренирование под управлением изображения, а затем алкогольная абляция, эффективно контролировали выделение желчи и способствовали выздоровлению полости. В заключение перкутанное внутрипеченочное дренирование остается ключевой стратегией для управления остаточными эхинококковыми полостями, а алкогольная абляция служит вспомогательной терапией для остановки потока желчи и ускорения разрешения полости.

Ключевые слова: остаточная полость; кистозный эхинококкоз; хирургическое лечение; перкутанное дренирование; алкогольная абляция.

Introduction. Cystic echinococcosis (CE) refers to a parasitic infection caused by the larval stage of *Echinococcus granulosus sensu lato*, capable of infiltrating various bodily organs such as the brain, lungs, and liver [1,2]. Affliction of the liver, known as hepatic cystic echinococcosis, has been documented in up to 75% of CE instances. While relatively uncommon in Europe, there exists a substantial incidence of hepatic CE in less developed nations [3,4]. Various medical and surgical treatment alternatives have been introduced to manage hepatic CE. Among these options, endocystectomy presents a conservative strategy that steers clear of aggressive interventions and liver removal procedures [5].

The treatment of residual cavities in liver cystic echinococcosis typically involves a combination of medical therapy and surgical intervention [6-9].

• **Medical Therapy:**

Albendazole: This is the drug of choice for the medical management of liver cystic echinococcosis. It is used both pre- and post-operatively to reduce the viability of the parasite and prevent recurrence. Albendazole is typically administered at a dosage of 10 to 15 mg/kg per day for several weeks to months.

Praziquantel: Although less commonly used for liver cystic echinococcosis compared to albendazole, praziquantel may be used as an adjunctive therapy in some cases.

• **Surgical Intervention:**

Percutaneous Treatment: Techniques such as percutaneous aspiration, injection of protoscolicidal agents (e.g., hypertonic saline, ethanol), and

reaspiration (PAIR) may be employed for the treatment of liver cystic echinococcosis. This approach is particularly suitable for patients who are not candidates for surgical resection or those with inaccessible cysts.

Surgical Resection: For larger or complex cysts, surgical resection remains the mainstay of treatment. This may involve techniques such as partial hepatectomy, cystectomy, or pericystectomy. Surgical intervention aims to completely remove the cyst while preserving hepatic function.

Hydatid Cyst-Biliary Fistula Management: In cases where hydatid cysts communicate with the biliary tree, additional procedures such as cysto-biliary communication closure, bile duct exploration, or hepaticojejunostomy may be necessary to manage biliary complications.

• **Follow-up and Monitoring:**

Long-term follow-up is essential to monitor for recurrence or residual disease. Imaging modalities such as ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI) may be used to assess treatment response and detect any recurrence.

Serological tests, such as enzyme-linked immunosorbent assay (ELISA) for echinococcal antigens, may also be utilized to monitor treatment response and identify recurrence.

After the surgical intervention can occurred a lot of postoperative complications, such as biliary leakage, biliary fistula, residual cavity bleeding, residual cavity infection, pleural effusion, wound infection, anemia, and pneumonia [10].

When a residual cavity remains after a large echinococectomy, it can be asymptomatic for many years. However, in some cases, when the contents of the cavity become infected, or the segmental bile duct opens in the cavity and bile also accumulates in the residual cavity may appear such symptoms as high hectic fever, pain in the right flank region, tremors, jaundice, etc.

The aim of this case report is to describe the management and treatment outcomes of a residual cavity following a hepatic echinococectomy, with a particular focus on a minimally invasive approach involving percutaneous intrahepatic drainage and alcohol ablation.

Case presentation

Main complaints. A 40 years-old man presented to the Department of General Surgery, Astghik Medical Center of Armenia, with symptoms started 2-3 months before:

- Pain and sense of heaviness in the upper right part of the abdomen;
- General weakness;
- Discomfort.

At the time of admission blood pressure was 130/90, heart rate-74, respiratory rate – 16, body temperature – 36.6.

History of past illness. The patient had no significant past illness.

Personal and family history. The patient had no significant personal and family history.

Physical examination. The physical examination was significant for pain in the right upper quadrant upon palpation.

Laboratory examinations. All laboratory testing, including glutamic-pyruvic transaminase, glutamic-oxalacetic transaminase, gamma-glutamyl transpeptidase, and alpha-fetoprotein, was normal, tests for hepatitis were negative.

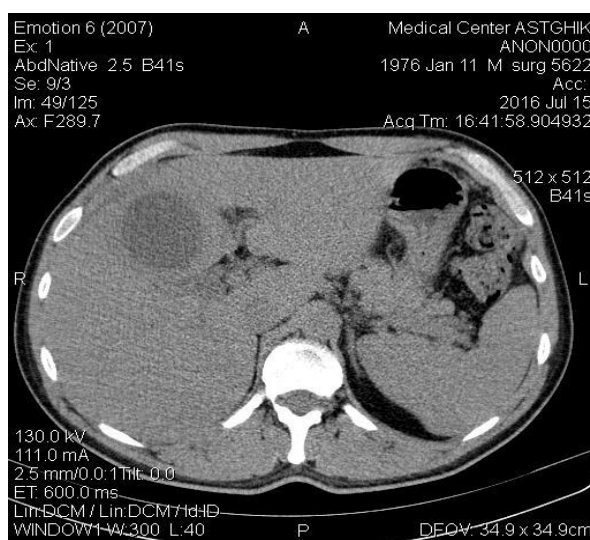
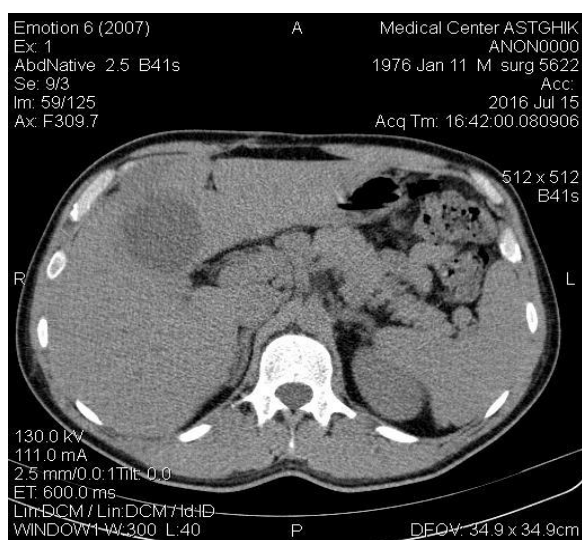
Imaging Examination. Computed tomography of the abdomen revealed a huge cystic lesion in the liver, sized about 16.9 cm × 12.2 cm 15.0 * 6.5 * 5.5 cm size in 4th segment of the liver which was considered a cyst of echinococcus (without biliary or portal hypertension).

Surgical Treatment. Laparotomy, puncture for removing fluid of cyst, injection of formalin to the cyst cavity, incision and removing of hydatid layers and hydatid fluid, washing cavity by hypertonic salt water solution, putting drain in a residual cavity. The drain was removed on the 7th postoperative day. He was discharged with recovery, antiparasitic drug treatment was prescribed: Albendazole 400mg per day according to the accepted scheme.

After 3 months, the patient was again hospitalized in the surgical department with the following complaints. Symptoms include:

- Pain and sense of heaviness in the upper right part of the abdomen;
- General weakness;
- Jaundice skin and eyes (total bilirubin-149mkmol/l, conjugated bilirubin-119 mkmol/l);
- Total amilase-67 U/L, ASAT-75U/L, ALAT-126U/L, WBC-6.4, Eosinophils-7.0).

Computed tomography(CT) of the abdomen revealed Residual cavity (Fig. 1).



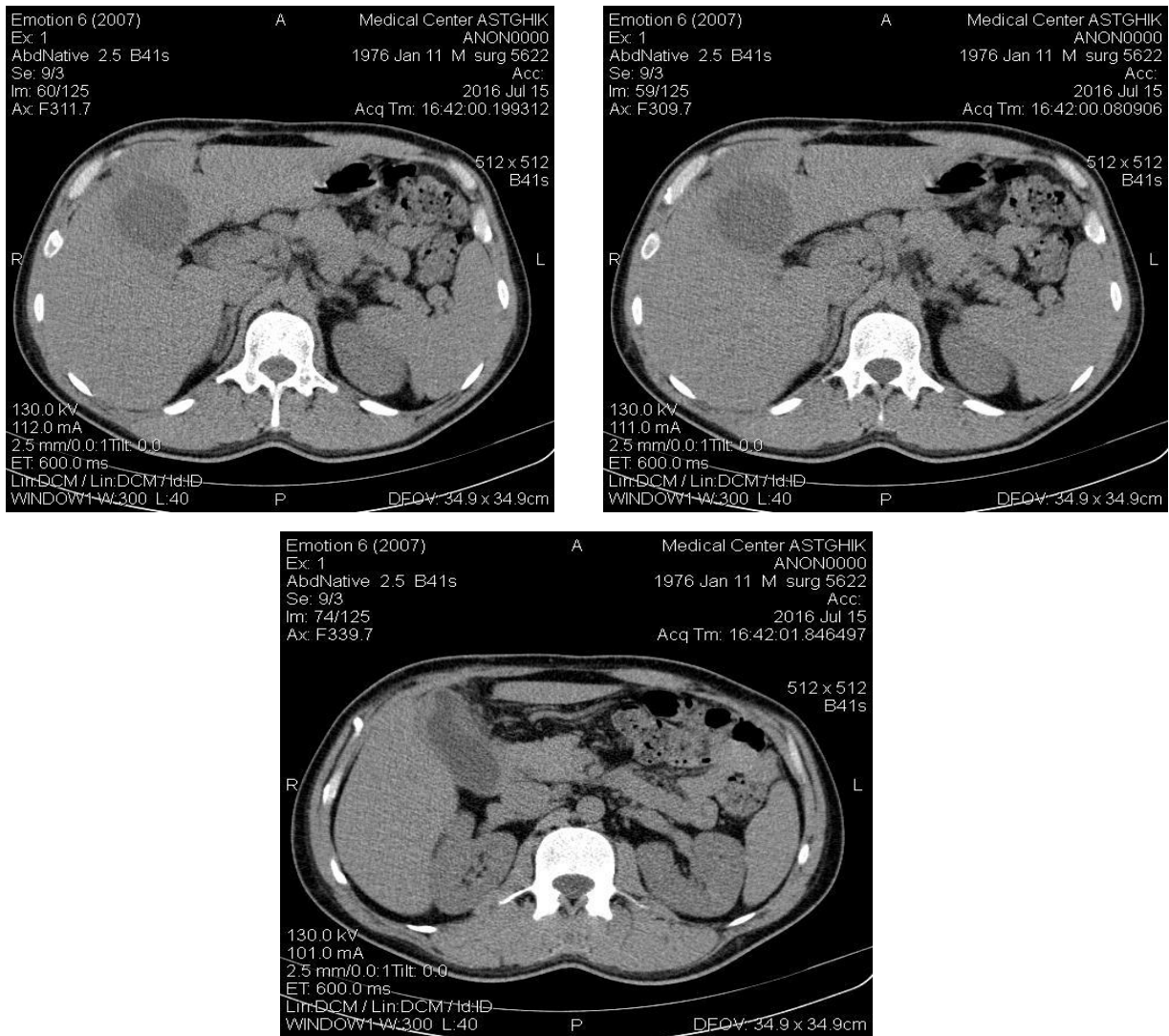


Fig. 1. Residual cavity after Liver cystic echinococectomy.

Percutaneous intrahepatic drainage was performed under CT control (Fig.2).

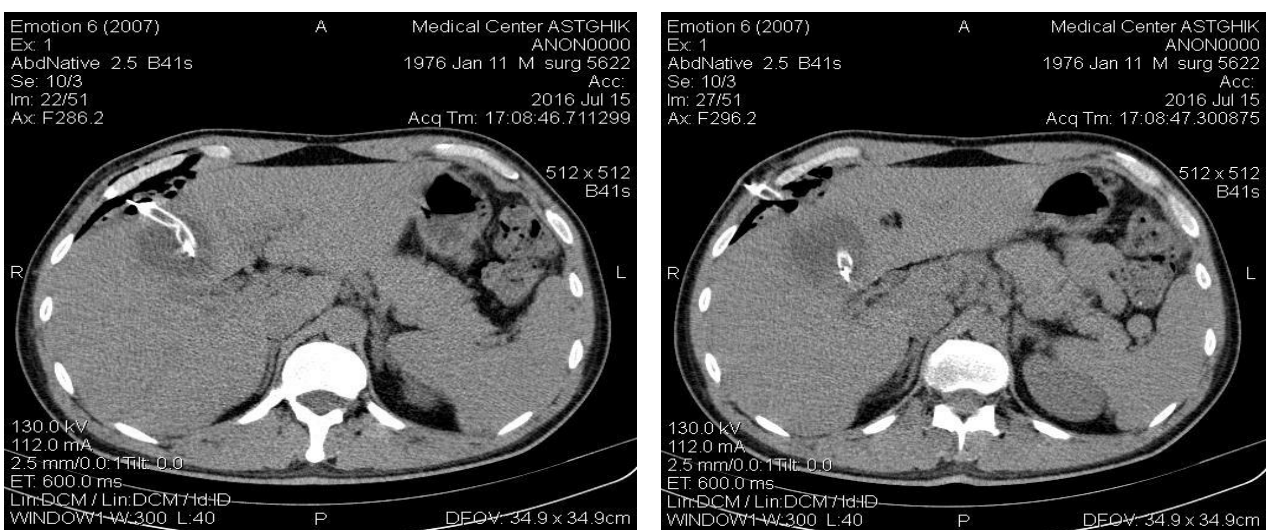


Fig. 2. Percutaneous intrahepatic drainage.

Table 1 – Shows the amount of drainage content and the changes in biochemical indicators in the sequence of days after drainage

Days	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	14th	21th
Drain fluid (ml)	160	180	100	80	50	20	10	few	few	few	few	-
Total Bilirubin	149	122	94	74	52	NA	NA	NA	NA	39	NA	14
Conjugated Bilirubin	119	101	70	54	37	NA	NA	NA	NA	28	NA	5
Direct Bilirubin	30	21	24	20	15	NA	NA	NA	NA	11	NA	9

Note: Reference data for biochemical indicators: Total Bilirubin - 3-22 mkmol/l; Conjugated Bilirubin: 0-5 mkmol/l; Direct Bilirubin: 3-19 mkmol/l

Three days after drainage, a 96% alcohol ablation of the cavity was performed. 5-10 ml of 96% alcohol solution was introduced into the residual cavity with drainage, the drainage was closed with an instrument and after keeping it in the residual cavity for 5 minutes, the drainage was opened again, the alcohol solution was automatically expelled from the residual cavity. Alcohol ablation was repeated for 3 days. as a result, in the following days, the production of bile from drainage gradually decreased, and on days 8-14, there was a slight production of bile. On the 14th day of drainage, the drain was removed. Dynamically, bilirubin levels were adjusted after removal of pressure on the bile duct after drainage of the residual cavity, and values were recorded within normal limits 21 days after drainage.

Conclusion. The best method of treatment of residual echinococcal cavity in the liver continues to be the minimally invasive percutaneous intrahepatic drainage under the control of Ultrasound or CT. Our modest experience shows that in the presence of bile flow in the residual echinococcal cavity of the liver, alcohol ablation can be used along with the drainage, which may help to stop the bile flow and remove the drain from the residual cavity as quickly as possible.

The case illustrates the successful use of these techniques in the treatment of a postoperative complication (bile flow in the residual cavity), with a significant improvement in the patient's condition and biochemical indicators. This approach might offer a viable alternative to more invasive procedures and highlights the importance of monitoring and treating potential complications associated with cystic echinococcosis of the liver.

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For citation

Harutyunyan H., Harutyunyan A.A., Voskanyan A., Barseghyan H., Chopikyan A.S., Tadevosyan A.E. Our experience in the treatment of residual cavity of the liver cystic echinococcosis (case report). *Euroasian Health Journal.* 2024;2:84-89. <https://doi.org/10.54890/1694-8882-2024-2-84>

Information about the authors

Hayk Harutyunyan – MD, PhD, Department of General Surgery, Yerevan State Medical University, Astghik Medical Center, Yerevan, Armenia. <https://orcid.org/0000-0001-5674-5130>, e-mail: doctorhayk@yahoo.com

Armine Harutyunyan – MD, Department of Public Health and Healthcare Organization, Yerevan State Medical University, Yerevan, Armenia. <https://orcid.org/0000-0003-4330-2503>, e-mail: Dr.arminearmenovna@gmail.com

Arayik Voskanyan – MD, PhD, Department of Endoscopic and Endocrine Surgery, Yerevan State Medical University, Astghik Medical Center, Yerevan, Armenia. E-mail: arayik.voskanyan@yandex.ru

Hayrapet Barseghyan – MD, DSci in Medicine, Department of General Surgery, Yerevan State Medical University, Astghik Medical Center, Yerevan, Armenia. E-mail: generalsurgerydep@gmail.com

Armine Chopikyan – MD, PhD, Department of Public Health and Healthcare Organization, Yerevan State Medical University, Yerevan, Armenia. <https://orcid.org/0000-0001-7041-9091>, e-mail: arminchopikyan@gmail.com

Artashes Tadevosyan – MD, PhD, DSci in Medicine, Department of Public Health and Health Care Organization, Yerevan State Medical University, Yerevan, Armenia. <https://orcid.org/0000-0001-7737-2978>, e-mail: artashes.tadevosyan@meduni.am