

## CASE REPORT

# One-stage surgery for both hepatic and left ventricular hydatid cysts using transthoracic route

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## Abstract

Hydatid disease is a major health problem. Multiorgan involvement including the heart and the liver is a very rare presentation. Management of multivisceral hydatidosis through a sole incision should be considered when possible. Median sternotomy is considered in our case.

## KEYWORDS

cardiopulmonary bypass, cysts, diaphragm, echinococcus granulosus, thoracic surgery

## 1 | INTRODUCTION

Hydatidosis is a public health problem around the world especially in undeveloped areas with huge financial consequences. It is located in more than 65% of cases in the liver and for about 25% in the lungs.<sup>1</sup> Involvement of the heart by hydatidosis is much less common and occurs with an incidence of around 2% of all hydatid locations.<sup>2</sup> Furthermore, multiorgan involvement with simultaneous cardiac and liver hydatid disease is very unusual. We present a case of 24-year-old man who underwent a successful one-session surgery for cardiac and liver cysts through a unique trans-sternal route.

## 2 | CASE REPORT

We report the case of a 24-year-old man, with no past medical history, complaining for 4 months of an upper right abdominal pain. Physical examination was normal, and laboratory test results were within normal limits. Electrocardiogram and chest radiograph were normal. Ultrasonography of the abdomen was performed and showed a left hepatic cystic

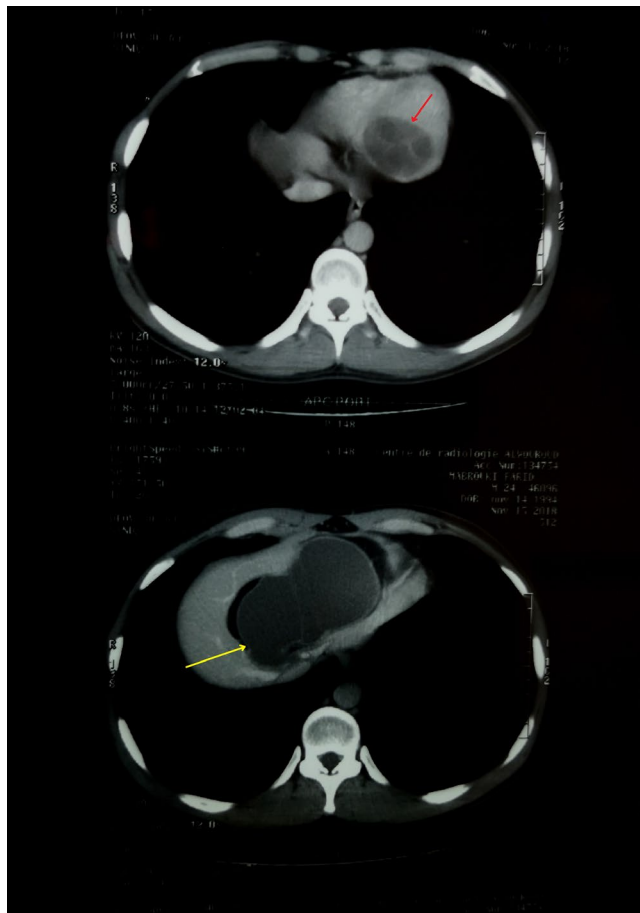
image (10\*7cm) providing strong support for the diagnosis of hydatid liver cyst. The patient was subjected to a computed tomography (CT scan) of the abdomen confirming the diagnosis. Additional upper thoracic scan was performed, discovering incidentally, a cyst in the heart (Figure 1). An echocardiography substantiated the diagnostic of an intramyocardial hydatid cyst located within the posterior left ventricular wall measuring 50mm\*38mm without generating cardiac hemodynamic trouble nor any valvular dysfunction. Magnetic resonance imaging (MRI) confirmed the diagnosis with dual visceral localizations in the liver and the heart (Figure 2).

We decided to perform surgery in one session to treat the two lesions simultaneously.

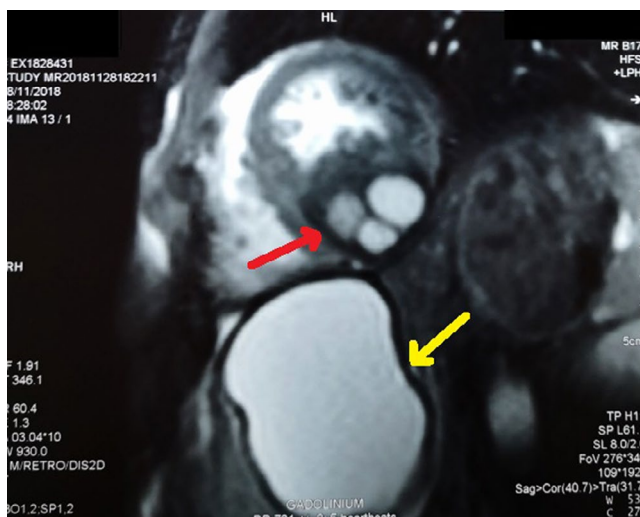
Surgery was done in two steps: Initially, a median sternotomy was performed, and cardiopulmonary bypass was established using bicaval cannulations. The exploration showed a cystic mass occupying the posterior wall of the left ventricle. The operative field was sterilized with hypertonic saline serum. Then, the cyst was opened and evacuated entirely. Finally, the residual cavity was closed using a Teflon felt supported running sutures. Weaning from bypass, decannulation, and hemostasis were performed without incidents.

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**FIGURE 1** Cardiac (red arrow) and hepatic (yellow arrow) cysts on thoraco-abdominal CT scan



**FIGURE 2** Axial MRI showing both cardiac (red arrow) and hepatic (yellow arrow) cysts

During the second step, the central diaphragm was incised radially above the palpated liver cyst. Cystotomy was performed to remove the germinative membrane. There was no important bile leak nor important biliary fistula

identified. The residual cavity and the remaining pericyst liver tissue were left untouched. The second step was ended by an active drainage of the remnant cavity using redivac drains. The diaphragm was then firmly closed. The patient was discharged after one week from surgery. Redivac drains were removed one week after discharge. The post-operative period was uncomplicated, and follow-up with echocardiography and CT scan confirmed the excellent postsurgery result without any complications or recurrence of the disease.

### 3 | DISCUSSION

Hydatid disease in various and simultaneous locations such as liver and heart is an uncommon clinical entity. Cardiac hydatid cyst may be asymptomatic and incidentally discovered during the assessment of other visceral hydatid locations like in our case. Abdominal ultrasonography is the first-line modality to assess liver hydatid cysts. CT scan, cardiac MRI, and eventually echocardiography are the gold standard for diagnosis of cardiac hydatidosis. A multimodality and integrative diagnostic approach are highly recommended in patients with liver hydatid cyst disease to check other potential subclinical locations. Early diagnosis and timely intervention of heart hydatid localization are very important to prevent serious cardiac hydatidosis complications such as myocardial ischemia following compression of the coronary arteries, anaphylaxis, and embolism following a rupture in the blood circulation and conduction disorders by compressive effect on the cardioneuror tissues.

Three different surgical therapeutic options can be discussed in our patient:

- The first is the conventional approach: treating in separately surgical sessions the heart hydatid cyst then the liver hydatid cyst.
- Simultaneous management of the intrathoracic cyst (in our case the heart cyst) and the liver cyst in one sitting through specific routes for each localization namely thoracic route and laparotomy.<sup>3</sup>
- Simultaneous treatment of the liver and cardiac cysts using only one thoracic route.

We chose the last option for our patient as we believed it is the optimal one in our case. To author's knowledge, there are no data in the literature describing such specific approach.

Many authors have investigated the efficacy and potential benefits of one-session surgery for pulmonary and liver cysts over the conventional approach.<sup>4,5</sup> There is now an increasing amount of literature adding a favorable evidence for the single session surgery in the case of multioragan hydatidosis involvement whenever possible.

The main driver in our decision-making is that this approach confers several benefits like preventing the patient from undergoing a second anesthesia and surgical procedure and reducing the length of postoperative stay, thus decreasing hospital costs. Furthermore, this option offers less pain and fewer scars and contributes to faster rehabilitation and professional integration essentially in young patients.

The basic tenets of the surgical treatment of liver cysts and other visceral localizations in general are inactivation of the cestode parasite, evacuation of the cyst cavity, removing the germinative layer, and obliteration of the residual cavity.<sup>6</sup> We chose to perform a very conservative technique for the liver cyst: a cystotomy with extirpation of the germinative membrane and prolonged aspiration by redivac drains of the residual cavity to avoid the capitonage.

The principal point that can be addressed concerning our surgical procedure is that the central transdiaphragmatic approach does not provide an easy view and adequate angle for surgeons to suture biliary openings and to perform capitonage which was the case in our patient. The second issue is the potential postoperative development of biloma due to bile leak.<sup>7</sup> The authors believe that in the case of subphrenic liver cysts, the risk of a biloma formation is not substantial and can be minimized by prolonged active drainage by redivac tubes. We think it is logical to assume that even in the case of recurrence of biliary fluid in the subphrenic space; a less invasive technique can be applied. The excellent outcome of our patient attested that this approach is convenient in some presentations like a subphrenic liver hydatid cyst with the setting where the cyst is not easily amenable to capitonage.

## 4 | CONCLUSIONS

Hydatid disease remains an important health problem in many countries worldwide.

We report a case of 23-year-old man with coexisting heart and liver hydatid cysts managed in the same surgery session through an only median sternotomy. To the best of our knowledge, this surgical option of treating both liver and cardiac hydatid cysts via a unique trans-sternal route in the same surgical session has never been described in medical literature. It may be a useful approach to simplify surgery, with less impact on the patient or to avoid a repeated general anesthesia.

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## CONFLICT OF INTEREST

None declared.

## AUTHOR CONTRIBUTIONS

Hatem Lahdhili: provided clinical care and wrote the case report. Mokhles Lajmi: wrote the case report, edited the case report, and served as a corresponding author. Housseem Messaoudi: provided clinical care, performed reference search, and reviewed the literature. Wafa Ragmoun: revised and contributed to the manuscript. Slim Chenik M.D: approved the final revision of the manuscript.

## DATA AVAILABILITY STATEMENT

No supplementary data are needed for this case report, and no datasets were generated or analyzed during the current study.

## DECLARATIONS

This manuscript is not actually submitted for publication elsewhere. Patient consent has been obtained and available on demand.

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