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Navigation liver surgery for complex hydatid cyst with biliary tree communication



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ABSTRACT

INTRODUCTION: Today, liver surgery navigation is utilized only in high-specialized centers for patients affected by malignant diseases. However, navigated surgery may also be of great interest for benign diseases such as hydatidosis in particular if the hydatid cyst is communicating with the biliary tree. With navigation we know exactly in each moment during the surgery the relationship of the cyst with the vascular/biliary structures around it.

PRESENTATION OF CASE: Herein, we report a case of a 20-year-old W/M affected by hepatic hydatid cyst communicating with the right bile duct, causing recurrent cholangitis. The diagnosis was confirmed by endoscopic retrograde cholangiography and magnetic resonance imaging. The liver cystectomy was easily performed using a navigation system incorporating instrument tracking and three-dimensional CT-reconstruction, thus permitting a selective suture of the bile duct communicating with the cyst.

CONCLUSIONS: The navigated system may guide the surgeon in patients with severe and complicated hydatid cysts.

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1. Introduction

In general navigation systems could be of great importance in guiding in real time the surgeon during various procedures for different diseases. These navigations systems represent a major innovation in the field of liver surgery during the last five years. Their application is reserved quite exclusively to malignant diseases due to the high costs [1]. However, some severe benign disease could be more easily treated using these innovations. An example of a possible application is the guidance of procedures in case of complicated hydatid cyst.

Hydatid disease is a parasitic disease caused by *Echinococcus granulosus* and is endemic in Eastern Europe, the Mediterranean coast, and South Africa. The liver is the organ most frequently affected (50–70%) [2,3].

The complications of hydatid disease include rupture, infection, or anaphylaxis. Rupture of hydatid cyst of the liver is the most common complication [4,5]. Furthermore, the liver hydatid cyst could communicate with any part of biliary tree, causing potentially acute

cholangitis or jaundice, this could occurs in only 5–15% of cases [6,7].

Despite many advances in medical treatment and radiological intervention methods, the main therapy is still surgery [5]. The surgical treatment depends on the patient's general condition, the location and number of cysts, and the surgeon's experience. The main complications of the surgery are cyst rupture with anaphylactic shock or dissemination, uncontrolled bleeding and bile leakage [5]. Image-guided surgery (IGS) provides guidance information via the display of tracking surgical devices overlaid on preoperative tomograms, such as those provided by computed tomography (CT) or magnetic resonance imaging (MRI), which are 3-D in nature and of high resolution. Herein, we present a case of hydatid cyst of the liver with communication with the biliary tree causing recurrent cholangitis successfully operated with IGS devices.

2. Presentation of case

A 20-year-old W/M patient (of Armenian origin) was admitted to the hospital complaining of abdominal pain and jaundice since 8 days with no fever. Physical examination revealed yellowish discoloration of the sclera and abdominal tenderness in the right subcostal area.

On day 9 he had fever with chills and highly colored urine. Liver function test showed a total bilirubin of 12 mg/dl, ALT 82 U/L, and ALP 125 U/L. Abdominal ultrasonography showed a 110 × 98 mm cystic mass in the right lobe.

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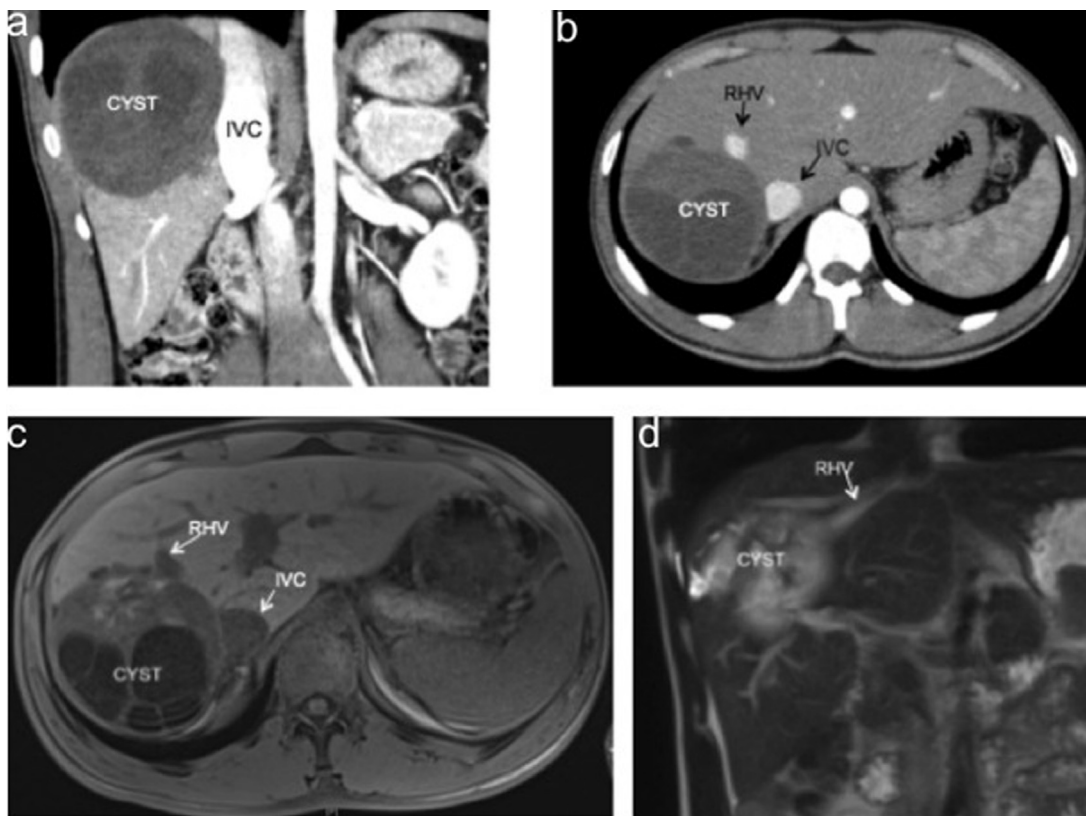


Fig. 1. (a–b) CT-scan before surgery, (c–d) MRI confirms the vascular rapport of the cyst and its communication between with the biliary tree (d). CYST: hydatid cyst, IVC: inferior vena cava; RHV: right hepatic vein.

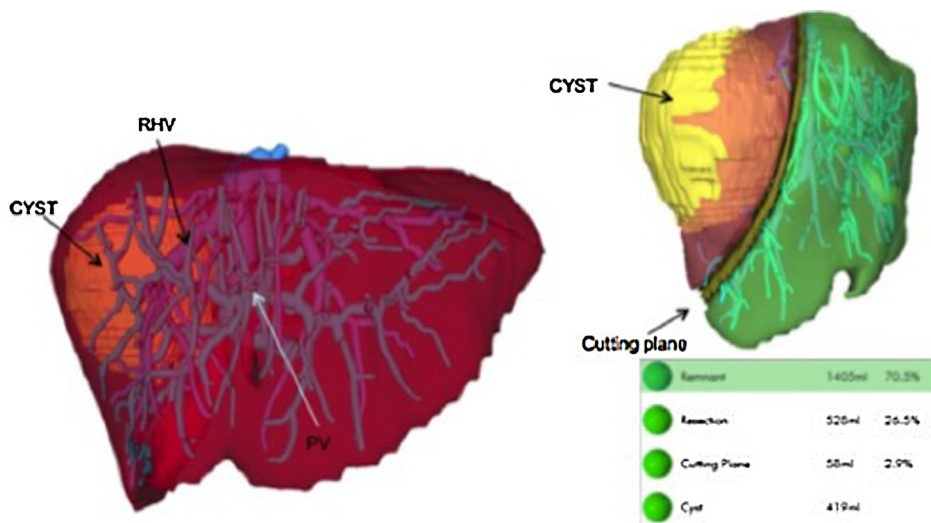


Fig. 2. Pre-operative imaging planning. CYST: hydatid cyst, IVC: inferior vena cava; RHV: right hepatic vein; PV: portal vein. Volumetry of the liver (right below).

CT-scan showed a uniloculated cyst of the right liver, contiguous with the retro-hepatic vena cava and the right hepatic vein (Fig. 1a). Abdominal magnetic resonance imaging (MRI) conducted the same day showed a uniloculated mass that was hypointense on T1-weighted images, with no contrast uptake in T2 hyperintense secants with a suspected biliary fistula (Fig. 1b). The ERCP cholangiopancreatography showed communication of the hidatic cyst with the right biliary tree and the absence of parasites in the common bile duct.

The serological investigation was positive for hydatid disease and surgical intervention was planned for peri-cystectomy to reduce the risks of rupture and parasitic dissemination. The surgery was performed with the aid of the liver navigation system during the open surgery. The follow up was uneventful, and the radiologic post-operative study (CT-scan) was good (Fig. 5). The patient was discharged on postoperative day 15 and albendazole was administered for 3 months. Histological investigation confirmed a hydatid cyst.

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