

## Cases Number 6

### 1st Clinical Case

77-year-old female

#### **Past patient medical history negative**

#### **Recent medical history**

The patient had been complaining of right hypochondriac pain for some months spreading to the right shoulder, abdominal tension, early sense of satiety and dyspepsia.

#### **Physical examination**

Hepatomegaly with hepatic margin to the transversal umbilicus line.

#### **Diagnostic examination**

Ultrasonography (US) and computerized tomography (CT) revealed the presence of a vast cystic area occupying the right lobe of the liver and two smaller cysts in S4 and S2. Routine blood and liver function tests were normal. Serological tests for echinococcosis were negative.

The **diagnosis** was of giant symptomatic liver cyst with hemorrhagic complication. Surgical treatment was indicated.

#### **Surgical Procedure** (see video no. 1)

Open laparoscopy: Hasson trocar positioned three fingers transverse below the umbilicus. Constant CO<sub>2</sub>-12 mm Hg pneumoperitoneum. Presence of a large cyst occupying the whole right liver, with lateral satellite cysts and two other smaller cysts in the 4<sup>th</sup> and 2<sup>nd</sup> segments is confirmed. Two additional 10 mm trocars inserted at the intersection between anterior axillary and transverse umbilicus line, to the right and to the left, respectively.

Aspiration puncture under vision of the large cyst with evacuation of brownish sero-hematic liquid, a sample of which is kept for examination. The liquid's appearance confirms the diagnosis of hemorrhagic complication of the cyst. Evacuation of all liquid content (approximately 2 liters) from the larger cyst.

Exploration of the hepatic surface in the bottom of the cyst shows neither particular alterations nor signs of blood or bile exudation.

Lin's procedure of unroofing to remove the cystic wall up to the edge of the hepatic parenchyma using a harmonic scalpel and linear endoscopic stapler (*cut and sew*). Fenestration of the two smaller cysts that contain limpid, clear liquid. Extraction in bag of the cystic wall, which is sent for histopathological examination. Exploration of the abdominal cavity reveals no other pathological conditions. Toilet of the abdominal cavity. Tubular drainage at the bottom of the residual hepatic sac. Pneumoperitoneum deflated, trocars extracted and ports sutured.

Histological examination confirmed the diagnosis of simple cyst with hemorrhagic infiltrate.

The postoperative course was regular and the patient was discharged on the 5<sup>th</sup> postoperative day.

Four years after the operation the patient is free of symptoms. US examination shows megalic left hepatic lobe likely compensating for reduced volume of right liver; recognizable small cysts measuring less than 2 cm in diameter are visible.

## 2<sup>nd</sup> Clinical Case

68-year-old male

### **Past patient medical history**

Asymptomatic cholelithiasis for a number of years.

### **Onset of current disease**

For the month preceding hospitalization pain in the epigastric and right hypochondriac regions spreading to the homolateral shoulder, dyspepsia, abdominal tension.

### **Physical examination**

Palpable liver approximately three fingers below the ribcage. Sensation of pain at the gallbladder point. Slightly positive Murphy's sign.

## Diagnostic examination

Blood chemistry values normal.

US, CT: gallstones and large cyst in segment IV; MRI was inhomogeneous presumably due to coarse encysted clots (Figure 1). Three small cysts in S5 and S3.

Serological tests for echinococcosis negative.

Tumor markers negative

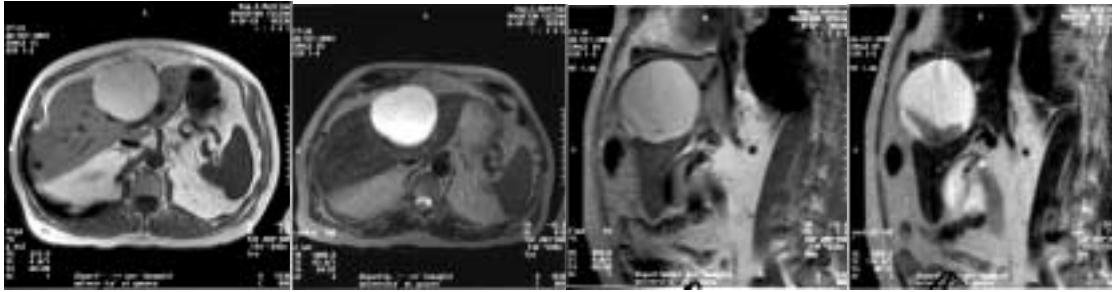


Figure 1 - MRI of the cyst: Observable, partly in c) and clearly in d) is the imaging of clots in a slanting position.

The **diagnosis** was of large symptomatic liver cyst with hemorrhagic complication - cholelithiasis. Surgical treatment was indicated.

## Surgical Procedure (see video no. 2)

Open laparoscopy with umbilical Hasson trocar. Constant CO<sub>2</sub>-12 mm Hg pneumoperitoneum. Introduction of three additional trocars according to Dubois' procedure. Confirmation of the presence of a large cyst emerging from below Glisson's capsule and occupying segment IV; cyst diameter approximately 15 cm. Three other smaller cysts present in S5 and S3.

The large cyst is covered by adherent omentum that confirms past inflammatory phenomena. Explorative needle aspiration yields a brown liquid, revealing past hemorrhage. Total liquid content of the cyst: 500 ml. A sample was kept for cytological examination. Lin's procedure of unroofing performed using a harmonic scalpel. Drainage and exploration of the cyst cavity that reveals the presence of coarse blood clots that confirm MRI findings; no evident signs of bile or blood exudation from wall of the cyst. Unroofing of the cyst completed up to its margins with the hepatic parenchyma using a linear stapler (*cut and sew*). The excised cyst wall is sent for histological examination. Fenestration of the other cysts, which contain colorless, clear liquid. Isolation of the gallbladder from the adherent omental

bands. Biliary tract appears normal. Interruption of the artery and the cyst duct between clips. Retrograde cholecystectomy. Extracted gallbladder shows usual wall alterations and contains stones. Control of hemostasis of the hepatic bed and of the residual cyst cavity. Toilet of the abdominal cavity. Placement of drainage tube laterally to the liver. Pneumoperitoneum deflated, trocars removed and ports sutured.

Histological examination confirmed the diagnosis of simple cyst with hemorrhagic infiltrate.

The postoperative course was regular and the patient was discharged on the 4<sup>th</sup> postoperative day.

At long-term follow-up the patient is free of symptoms and without appreciable signs of recurrence on imaging studies.

### **Considerations**

The term non-neoplastic (benign) nonparasitic liver cysts refers to:

- forms that are generally solitary, unilocular (multilocular forms may be neoplastic), simple but at times multiple;
- forms that arise throughout the entire hepatic parenchyma and are defined as “polycystic liver disease”.

The cases reported here regard the first.

It is believed that these cysts may be congenital in origin and likely derive from the persistence or the obstruction of small intrahepatic bile ducts that normally regress spontaneously during fetal development. A mesothelial origin has also been proposed.

Studies have reported a prevalence of less than 5% in the general population, with women being the most often affected. In most cases, cysts are superficial and appear below Glisson's capsule. These have thin walls and, if not complicated, contain limpid, clear, citrine liquid, the amount of which varies according to size. In the event of complications, the content may be hematic, biliary, mucous or purulent. Histologically, the wall is normally composed of a single layer of biliary-like epithelium supported by slender connective walls.

Liver cysts of this kind are usually asymptomatic and are detected incidentally during US examination or CT scan. They may become symptomatic when they reach a considerable size or when they become complicated, as in the cases described above.

While small asymptomatic cysts require no treatment, larger and symptomatic (complicated) cysts are indications for surgery: the operation of choice is unroofing

according to Lin (Ann. Surg. 168, 921-927, 1968). The procedure is readily performed laparoscopically, and numerous reports appearing in the literature have advocated both its short-term advantages and its long-term outcome.

The difference between fenestration and unroofing needs to be underlined: the first, if performed sparingly, may give rise to recurrences due to occlusion of the fenestration, be it for scarring or for adhesion of nearby organs. Zacherl (Surg. Endosc. 14, 59-62, 2000) proposed the term “refilling” rather than “recurrence” to define this situation. Most important, if the cyst lies near the gallbladder this may obstruct the fenestration and condition the recurrence, or better yet, the refilling. In cases such as the these, a cholecystectomy is advised.

As in the cases described, particular attention must be paid to the borders between the cystic wall and the hepatic parenchyma. In fact, since it is advisable to remove the entire cystic cupola, vascular and/or biliary canalicular elements may easily be found, wherever it comes into contact with the parenchyma. At this point, a harmonic scalpel and/or a linear endoscopic stapler (*cut and sew*), or, in lieu of these, instruments with similar functions, should be used. This precautionary measure serves above all to protect against possible biliary leaks.

Another recommendation regards the need to accurately explore the entire internal surface of the cyst on the parenchymal side in order to exclude biliary dripping. In such cases, what is usually a small biliary duct is closed with one stitch. Drainage of the residual cavity is advisable in complicated (bile, blood) cases or when large cysts are present. This does not, however, appear to be mandatory, especially for smaller-sized cysts.

Interestingly, at long-term follow up in the cases described here three events have emerged:

- 1) absence of cyst recurrence;
- 2) compensatory hypertrophy of the residual liver;
- 3) appearance of new small cysts with no pathological significance .

-----