

## Robotic Surgery for the Treatment of a Giant hepatic cyst: a case report and literature review..

V. Lombardo MD FACS<sup>1</sup>, F. Iaropoli MD PhD<sup>1</sup>, V. DiDio MD<sup>1</sup>, G. Pintabona MD<sup>1</sup>, V. Campolo MD<sup>1</sup>, A. Galeano MD<sup>1</sup>, G. Strano MD<sup>2</sup> L. Lucchese MD<sup>1</sup>

<sup>1</sup> Division of General Surgery, IRCCS Ospedale Piemonte-Messina Italy  
<sup>2</sup> Department of General Surgery, Queen's Hospital, Romford, Essex, UK

### Abstract

#### Background

Giant cysts of the liver are uncommon and usually asymptomatic and can be left untreated. When symptoms develop the cyst is enlarging with a mass effect and treatment, either surgical or percutaneous, is necessary.

#### Objective

To highlight the role of robotic surgery in the treatment of giant hepatic cyst.

#### Case report

A 73-year-old man presented to our Clinic with a recent history of an enlarging abdominal mass and some abdominal discomfort. An U/S and a CT scan of the abdomen with contrast showed a giant hepatic simple cyst. The serology for an hidatid disease was negative. Surgery

revealed an exophytic giant simple hepatic cyst arising from liver segment V that drained 4 liters of serous fluid.

#### Conclusion

Simple hepatic cysts are usually asymptomatic and can develop symptoms when enlarge. They should be considered in the differential diagnosis of intraabdominal masses.

### Introduction

Large cysts of the liver are uncommon<sup>3</sup> and the cause is not known, but believed to be congenital in origin<sup>1</sup>. Simple hepatic cysts rarely cause symptoms, however they may cause symptoms when complicated by a mass effect, rupture, haemorrhage, and infection. Large cysts can produce atrophy of the hepatic tissue

than may progress to atrophy of hepatic lobe with compensatory hypertrophy of the controlateral side<sup>4</sup>.

Sometime large a hepatic cystis adjacent to the gallbladder and the treatment may include cholecystectomy (Fig.4) and drainage of the cyst.

Treatment options include percutaneous aspiration, injection of sclerosing agents, laparoscopic or open fenestration, and surgical cystectomy<sup>6</sup>. In the era of Minimally Invasive and Robotic surgery, this approach seems to achieve better outcomes.

### Case report

A 73-year-old gentleman presented to our clinic with a history of increasing abdominal mass in the last 5 years. An ultrasound showed a large hepatic cyst. No prior history of trauma, nor associated fever, nausea and vomiting.

On the physical examination showed an enlarged abdomen more in the right upper quadrant with a palpable mass lesion extending below the umbilicus.

Laboratory work, that included liver function test, hepatitis profile and echinococcus antibody,

Radiology work up included an ultrasound and CT of the abdomen that showed an extensive hypodense cystic mass that filled most of the right side of the abdomen.

Elective surgical treatment was planned and the patient underwent Robotic excision of liver cyst. Fig.1-2



Fig.1 DaVinci Xi console setting



Fig.2 Robotic trocars

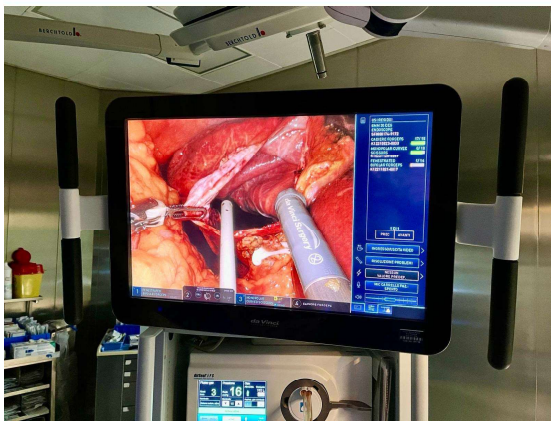


Fig.3 Cyst wall opened

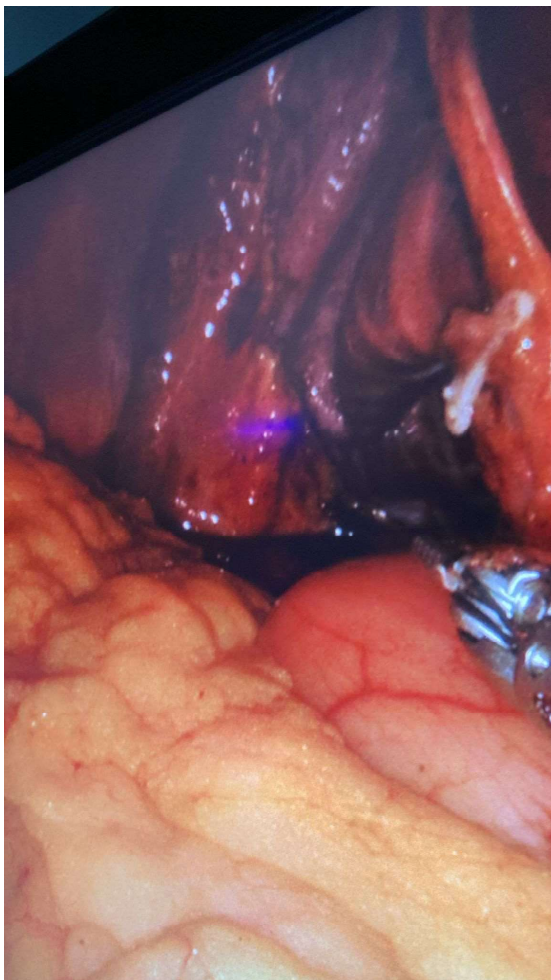


Fig.4 Cystic duct stump with hemlock clips

### Content of the cyst.

A robotic excision of the cyst wall was performed with vessel sealer resulting in a wide opening of the cystic cavity (Fig.3).

The histology of the sac showed columnar epithelium resembling biliary duct epithelium (simple hepatic cyst).

The postoperative period was uneventful, oral feeding commenced on the day 1 and patient discharged on POD 3 with a follow up visit after 7 days.

### Discussion

The hepatic cysts usually do not cause symptoms and occur in about 5% of the population. About 10% of patients develop secondary to massive enlargement and compression of adjacent organs<sup>2</sup>.

Simple cysts are more prevalent in women with a female: male (F: M) ratio approximately 1.5. In a report, Cowles and Mulholland reported a F: M ratio of 3:1 for asymptomatic patients and when symptomatic a F: M ratio of 10:1<sup>7</sup>.

Simple cysts are congenital and arise as an aberration of bile duct development in utero and lined by cuboidal epithelium<sup>7</sup>.

Simple hepatic cysts are cystic formations containing clear fluid that do not communicate with the intrahepatic biliary tree. The size ranges from a few millimetres to massive lesions occupying large volumes of the upper abdomen.

Compression of adjacent structures may result in the following clinical features: compression of the inferior vena cava resulting in lower extremity oedema, portal vein resulting in portal hypertension, and biliary tree resulting in jaundice<sup>3,12</sup>. Complications of the cyst may also result in acute abdomen from rupture, torsion and the cyst may become infected<sup>2,3,12</sup>.

Radiologic imaging techniques are useful in the detection and characterisation of hepatic lesions<sup>3,13</sup>. However, sonography is known to be operator dependent. Computerised tomography (CT) or magnetic resonance imaging (MRI) preoperative, are more accurate. however, the role of U/S in follow up of patients should be emphasized in order to detect ascites and recurrent cyst.

In recent years, many conventional open surgical procedures have been replaced by minimally invasive surgery<sup>3</sup>. Non-surgical methods, simple percutaneous aspiration

alone is not adequate because of associated risk of infection and recurrence is invariable<sup>6</sup>. Follow up results were better with the use of percutaneous aspiration especially with sclerosis. Marcho Perez et al reported successful treatment with aspiration and injection of phenol alcohol<sup>14</sup>. This procedure may lead to irreversible sclerosing cholangitis in the presence of undetected communication with the biliary tree<sup>15</sup>. Symptomatic nonparasitic cysts, even cysts of the liver (15–25cm) have been treated by laparoscopic management<sup>3</sup>.

A definitive role for Robotic surgery in selected patients is indicated especially in giant cysts that had taken up most of the abdomen, and displaced other organs. Laparoscopic management has treated symptomatic nonparasitic cysts, even cysts of the liver (15–25cm)<sup>3</sup>.

Intra-abdominal masses present diagnostic and therapeutic challenges especially in areas with limited radiographic imaging facilities. Giant simple hepatic cyst should be considered in the differential diagnosis of intra-abdominal masses.

### **Conflict of Interests**

The authors' declare that there are no conflicts of interests.



**Acknowledgments:** **None**

Funding information was not available

**Keywords:** Robotic surgery, giant hepatic cyst, drainage, wide excision.

### Correspondence:

Vittorio Lombardo, MD, FACS

e-mail: vittorio.lombardo@ircsme.it

Department of Surgery, "IRCCS Ospedale Piemonte" -Messina, Italy

### References

- Ismali KA, Mousa GI, El Khadrawy OH, Mohamed HA. Symptomatic non-parasitic benign hepatic cyst: Evaluation of management by deroofting in ten consecutive cases. *Ann Paed Surg.* 2010;6(2):83–89.
- Jackson HH, Mulvihill SJ. Hepatic cysts. available at <http://emedicine.medscape.com/article/190818-overview>. Updated March 11 2010
- Ozbalci GS, Taurikulu Y, Erel S, Kismet K, Akkus MA. Giant simple hepatic cyst (A case report) and Review of Literature. *Eur J Surg Sci.* 2010;1(2):53–57.
- Yawai H, Tada N. A simple hepatic cyst with elevated serum and cyst fluid CA19-9 levels: a case report. *J Med Case Report.* 2008;2:329.
- Mazza OM, Fernandez DL, Pekoli J, Pfaffen G, Sanchez CR, Molmenti EP, de Santibanes E. Management of non-parasitic hepatic cysts. *J Am Coll Surg.* 2009;209(6):733–739.
- Tucker ON, Smith J, Fenlon HM, McEntee GP. Giant solitary non-parasitic cyst of the liver. *Ir J Med Sci.* 2005;174(2):60–62.
- Cowles RA, Mulholland MW. Solitary hepatic cysts. *J Am Coll Surg.* 2000;191:311–321.
- Benhamon JP, Menu Y. Non-parasitic cystic disease of the liver and intrahepatic biliary tree. In: Blumgart LH, editor. *Surgery of the liver and biliary tract.* 2nd edition. New York: Churchill Livingstone Inc; 1994. p. 1197.
- Reger A, Reddy KR, Berho M, Seeman D, Levi JU, Livingstone AS, Levi D, Ali U, Molina EG, Schiff ER. Large cystic lesions of the liver in adults: a 15- year old experience in a tertiary center. *J Am Coll Surg.* 2001;193:36–45.
- Burch JC, Jones HE. Large nonparasitic cyst of the liver simulating an ovarian cyst. *Am J Obstet Gynecol.* 1952;63:441.
- Katkhouda N, Mavor E. Laparoscopic management of benign liver disease. *Surg Clin North Am.* 2000;80:1203–1211. [PubMed]
- Heap M, Seeger A, Hass CS. Giant solitary hepatic cyst. *Liver Int.* 2008;28:840.
- Gall TM, Onisai GC, Madhavan K, Parks RW, Garden OJ. Surgical management and long term followup of non-parasitic hepatic cysts. *HPB (Oxford)* 2009;11:234–241.
- Macho Perez O, Gomez Pavon J, Nunex Gonzalez A, Narvaiza Grau L, Albeniz Aguiriana L. Giant simple hepatic cyst as dyspnea symptoms in a 93- year-old patient. *An Med Interna.* 2007;24:135–137.
- Tocchi A, Mazzoni G, Costa G, Cassini D, Bettelli E, Agostini N, et al. Symptomatic nonparasitic hepatic cysts: options for and results of surgical management. *Arch Surg.* 2002;137:154–158.
- Mekeel KL, Moss AA, Reddy KS, Mulligan DC, Harold KL. Laparoscopic fenestration of giant hepatic cyst. *Surg Laparosc Endosc Percutan Tech.* 2008;18:511–513.