

## Laparoscopic procedure for rare liver's round ligament cyst: A case report

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### ABSTRACT

Liver's ligament cysts, especially uncommon and the liver's round ligament cysts, have been sporadically presented in some case reports during the past decade. All reported cases were treated by laparotomy. This report discusses the case of asymptomatic liver's round ligament cyst. The patient was hospitalized due to progressive epigastric pain for 1 week. Abdominal ultrasound and computed tomography scans showed a fluid density bulk in the pre-peritoneal space, suggestive of a cyst in the liver's ligament. A laparoscopy was indicated to excise this cyst and the specimens were sent to a pathologist. The patient recovered uneventfully and discharged after 1 day of operation. In conclusion, exploratory laparoscopy and total resection of these lesions are necessary to exclude malignancy. Furthermore, laparoscopic round ligament cyst removal is applicable and it helps the patient with enhanced recovery.

**Key words:** Cyst, Laparoscopic surgery, Round ligament

**L**iver's round ligament (Latin name: Ligamentum teres hepatitis) is a remnant of the embryonic umbilical vein. This ligament is a cord shaped and is continuous from the free edge of the liver's falciform ligament. Lesions of the liver ligaments are exceptionally infrequent and cysts of the falciform and round ligament have been reported before [1,2]. The clinical aspects of these cysts vary on presentation, from an epigastric palpable mass and pain to absolutely asymptomatic. The causes of these cysts are not well understood.

The diagnosis of such cases ranges from benign to malignant tumors originating from the liver ligaments, abdominal wall, or even disseminated cancer. Imaging studies such as ultrasound and computed tomography (CT) scan can confirm the cyst existence, but not well define the origin and cause of these lesions. Diagnosis is made on the basis of the pathology of the specimens that are obtained from laparotomy. We report the case of a 32-year-old patient with a symptomatic cyst of the liver's round ligament which was treated laparoscopically with total cyst removal. The pathologic result of this cyst was reported as well.

### CASE REPORT

A 32-year-old man was admitted to the general surgery department of Nhan Dan Gia Dinh Hospital with the complaint of progressive epigastric pain without other symptoms for 1 week. The pain was mild, continuously progressive, localized in the epigastric area, increasing when coughing or moving, and not related to diet. The patient had experienced a similar episode 2 years ago and the pain

had gone without any treatment. He denied neither medical nor any trauma history. Review of systems on general examination and vital signs was normal. An abdominal examination revealed a mild tenderness at the epigastric area.

Full blood cell count and biochemistry tests including tumor markers such as alpha-fetoprotein, carbohydrate antigen 19-9, 125 (CA 19-9, CA 125), and carcinoembryonic antigen were within the normal range. The chest X-ray was normal. The abdominal ultrasound examination showed a 39 mm × 25 mm × 22 mm cystic and liquid mass in the pre-peritoneal fat layer without abdominal free fluid. The ultrasound result suggested a pre-peritoneal hematoma. CT scan demonstrated the presence of a 27 mm × 46 mm × 25 mm lesion with #20–30 HU density mass, clear edge, and no enhancement with intravenous contrast in the pre-peritoneal fat layer (Fig. 1). No ascites, normal liver, and no other intra-abdominal lesions were found.

In laparoscopy, a 10 mm trocar was advanced in the periumbilical area, the exploration of the rest of the abdominal cavity showed a normal liver, and no other lesions except a mass in the round ligament (Fig. 2). The round part of falciform ligament was then removed laparoscopically to keep the cyst intact by two other 5 mm trocars in the left and right subcostal area (Fig. 3). The specimen examination showed a thick fibrous wall cyst, originated from a round ligament, 4.5 cm in diameter, with clear fluid when opened (Fig. 4). A single-layered cuboidal epithelium was seen microscopically on the cyst's wall depicting a simple cyst (Fig. 5). The patient's post-operative course was uneventful with slight pain. He was discharged on the 1<sup>st</sup> post-operative day.

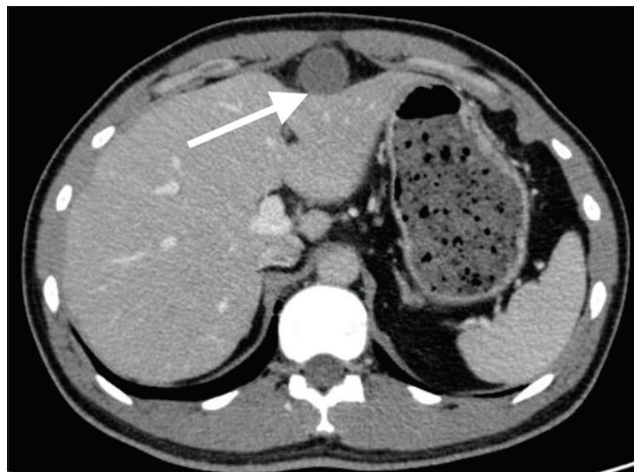


Figure 1: Abdominal CT scan with IV contrast show #20–30 HU density mass, clear border, and no enhancement with intravenous contrast in the pre-peritoneal fat layer (white arrow)



Figure 4: The round ligament cyst with thick fibrous wall (arrow) after opening

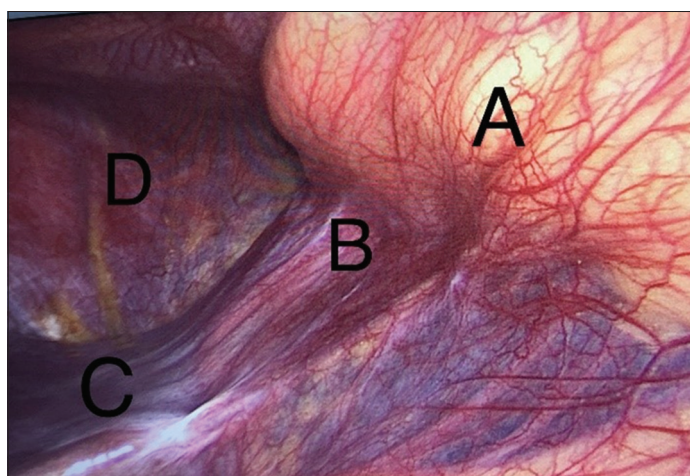


Figure 2: Imaging of the cyst in laparoscopy. (a) The round ligament cyst, (b) falciform ligament, (c) right lobe of liver, (d) diaphragm



Figure 3: The cyst is intact in the round ligament (right end)

The patient was followed up after 1 month without any pain or other complaints.

**DISCUSSION**

The first case of a serous cyst of the liver’s round ligament was reported in 1909 by Henderson [3]. Numerous types of tumors, tumor-like lesions, and cyst developing in the liver ligaments mainly in the round and falciform ligament were also noticed. A lipoma is more common [4,5], other rare benign tumors

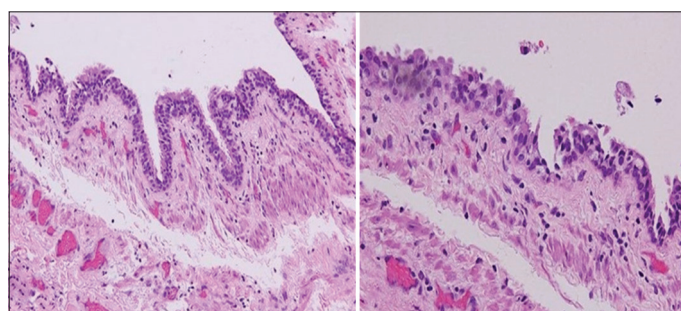


Figure 5: Hematoxylin-eosin staining of the cyst wall shows single-layered villous cuboidal epithelium without dysplasia

including fibroma, lymphangioma, and paraganglioma were also reported [6,7]. Primary malignant neoplasms to hepatic ligament such as leiomyosarcoma and mesothelioma are extremely rare [8].

There are two main types of liver ligament cysts, primary and secondary cyst, depending on their origin [2]. Primary cysts are caused congenitally such as defects of the mesenteric origin or partial obliteration of the umbilical veins [9]. Secondary cysts are the consequence of infections (parasites or bacterial abscesses), trauma (hematomas and bilomas), and cystic degeneration of neoplasms. Pathological features proposed the congenital cause of the cyst in our case. The chief complaint of these patients included vague right quadrant or epigastric abdominal pain. The main clinical sign includes palpable epigastric mass with mild tenderness. Imaging such as ultrasound or intravenous contrast CT scan is essential to confirm the cyst but cannot differentiate between malignancy and benign lesions.

All the cases reported by other authors were treated by open surgery with a midline incision above the umbilicus [1,3,9,10]. In our case, laparoscopic surgery benefited the patient in many aspects. Laparoscopy allowed the exploration of the entire abdominal cavity to rule out other intra-abdominal lesions or lymph nodes. Moreover, removing the cyst completely by laparoscopic procedure helped the patient avoid an invasive procedure such as midline incision.

**CONCLUSION**

Laparoscopy was the appropriate approach for unknown lesions of the abdomen. The liver's round ligament cyst diagnosis should be confirmed on the basis of the pathological examination of the specimen.

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