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Case Report

Sleeve Gastrectomy and Liver Cyst Unroofing in Morbid Obesity with Multiple Liver Cysts: A Case Report

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Abstract

Background : Obesity has become a major global health issue which leads to various complications, including hepatic diseases. However, we found a rare case of morbid obesity and symptomatic multiple liver cysts. This article aims to represent a rare case of morbid obesity and multiple liver cysts surgically managed by sleeve gastrectomy and liver cyst unroofing which were performed in a single surgery.
Case report : 41-year-old female presented with morbid obesity and blunt intermittent abdominal pain in the right upper quadrant. Stage II hypertension, tenderness on the right upper quadrant of the abdomen and epigastrium were found in clinical assessment. Lipid profiles were shown to be elevated. Abdominal CT revealed fatty liver and multiple cystic lesions in all hepatic segments.
Discussion : Non-parasitic liver cysts affect 2–18% of the global population, with a higher prevalence in females possibly due to hormonal factors. Obesity is associated with hormonal alterations, potentially leading to increased secretion of FSH and LH.
Conclusion : Sleeve gastrectomy and liver cyst unroofing may be considered as a treatment strategy for patients with morbid obesity and multiple liver cysts.

Keywords : obesity, sleeve gastrectomy, liver cyst

INTRODUCTION

Obesity has emerged as a significant global health issue in recent years. The worldwide number of overweight and obesity people have increased from 105 million in 1975 to 641 million in 2014, resulting in more than one-third of the world's population now being categorized as overweight or obese.[1] A study conducted by Kelly *et al*. stated that 57.8% of the global population will be overweight or obese by 2030 if the current trends persist.[2] Obesity is characterized by a body mass index (BMI) of over 30.0 kg/m^2. Meanwhile, morbid obesity is defined as a BMI of 40.0 kg/m^2 or higher, while also experiencing obesity-related health conditions.[3]

Obesity is associated with various complications, including hepatic diseases.[3] Up to 90% of patients in a cohort who experienced bariatric surgery have non-alcoholic fatty liver disease (NAFLD).[4] However, we found a rare case of morbid obesity presented with multiple liver cysts. Liver cysts are characterized as small abnormal fluid-filled sacs that are formed in the liver tissue.[5,6] The prevalence of liver cysts in the United States ranges 15–18%.[7] These cysts are often asymptomatic and typically identified incidentally on imaging studies. The exact cause of most liver cysts is not fully understood, and their etiologic pathogenesis remains unclear.[8]

This article aims to represent an approach where two procedures, sleeve gastrectomy and liver cyst unroofing were performed in a single surgery. We believe our successful treatment approach may provide valuable insights and guidance for surgeons who encounter similar cases in their clinical practice.

CASE REPORT

A 41-year-old woman came to our outpatient clinic with a chief complaint of blunt intermittent abdominal pain in the right upper quadrant for 2 years. The patient had morbid obesity (body weight: 134 kg, body height 163 cm, BMI: 50.4 kg/m^2) with 13 years of weight gain. She denied having fever, jaundice, nausea, and vomiting. She had no history of alcohol consumption. There was no significant family history of malignancy.

Upon clinical assessment, stage II hypertension with blood pressure of 190/110 mmHg and tenderness on the right upper quadrant of the abdomen and epigastrium were identified. There was no sign of hepatomegaly, cirrhosis, or liver nodule. Other clinical findings were insignificant.

The hematological and liver function tests were within normal range. Elevated lipid profiles were identified (total cholesterol: 207 mg/dL, LDL: 164 mg/dL, and TGL 162 mg/dL). Immunological studies for hepatitis B and C were negative. An abdominal CT was performed, revealing fatty liver and multiple cystic lesions in all hepatic segments (largest diameter in segment IV; anteroposterior 5.7 cm x latero-lateral 7.3 cm x craniocaudal 6.4 cm).

Laparoscopic sleeve gastrectomy and liver cyst unroofing were performed under general anesthesia. The patient was positioned reverse trendelenburg with abducted legs. An infraumbilical incision was made for insertion of an 11 mm optical view trocar into the abdominal cavity. Then, the abdominal cavity was insufflated with CO2 gas. The second trocar (12 mm) and third trocar (5 mm) as the working trocars, the fourth trocar (5 mm) as the assistant trocar, and the fifth trocar as the liver retractor were inserted into the abdominal cavity. The positions of the trocars are shown in Figure 2a. Hepatic cysts on the left lobe with diameter more than 2 cm were unroofed, as shown in Figure 2b. Smaller hepatic cysts (d < 2 cm) were drilled. Then, sleeve gastrectomy was performed by dissecting greater curvature of the stomach at 5 cm from the pyloric sphincter to 1.5 cm from the gastroesophageal junction using linear staplers, as shown in Figure 2c. Then, the stomach was tested with 75 mL of methylene blue to ensure no leakage was present. Omentoplasty was also

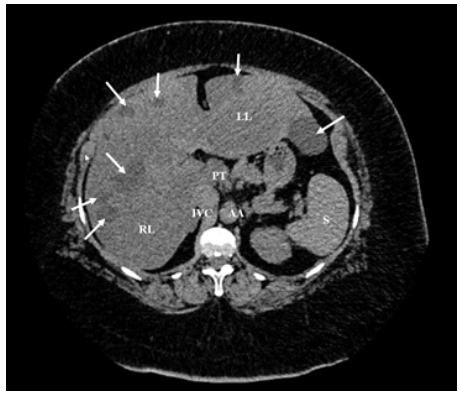
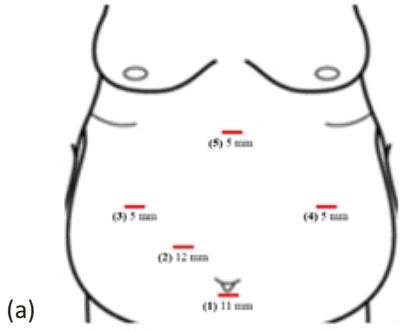


Figure 1. Abdominal CT scan showed multiple liver cysts (arrows) in the right lobe (RL) and left lobe (LL) of the liver. Other structures can be identified in relation to the liver: portal triad (PT), inferior vena cava (IVC), abdominal aorta (AA), and spleen (S).



(a)

(b)

(c)

Figure 2. (a) The location of skin incisions with size of the ports; (b) liver cyst unroofing; (c) sleeve gastrectomy.

performed on the gastric line resection. Lastly, a drainage tube was set and incisions were closed.

The postoperative condition was uneventful. Drainage production was monitored every day, and it was found to be less than 50 mL on day 2 post-procedure. The patient was discharged on day 5 in good conditions. Home visit was done after 6 months, and she has lost 23 kg with no complaint of right upper quadrant abdominal pain.

DISCUSSION

The prevalence of non-parasitic liver cysts is 2–18% among global population, with significantly higher likelihood of occurrence in females.[9] This may due to higher levels of FSH and LH in premenopausal women.[10] In addition, obesity is associated with alteration of hormonal pathways in women. Estradiol levels were found to be lower in premenopausal obese women, the mechanisms for this association are not clearly identified.[11] Lower estradiol levels in obesity may lead to negative feedback to hypothalamus-pituitary axis, thus higher FSH and LH levels are secreted.[12] It is important to note that not all patients with morbid obesity will develop liver cysts, and the impact of obesity may vary from one person to another. Therefore, further research may be necessary to explore the possible correlation between liver cysts and obesity.

The symptoms of non-parasitic liver cysts are related to the distention of Glisson's capsule as the cyst enlarges or experiences intracystic hemorrhage. Unusual cases of infected cysts may also be symptomatic.[13] Surgical intervention is indicated only for patients demonstrating noticeable symptoms.[13,14] Symptomatic liver cysts may be managed by several surgical methods, such as percutaneous aspiration and sclerotherapy, open or laparoscopic unroofing, radical cystectomy or liver resection.[15] Simple cyst aspiration is not preferred due to high recurrence rates, up to 100% of cases.[16] Injection of sclerosing agent following aspiration can decrease recurrence rates to less than 1%.[17] However, this method cannot be applied if there is a communication between the cyst with the biliary tree.[15] In addition, larger cysts with diameters exceeding 15 cm appear to have 50% chance of recurrence.[18] Liver cyst unroofing can be conducted by open or laparoscopic procedure by removing a part of, or the entire cyst wall with fulguration of the cyst bed. The suitability for laparoscopic unroofing is influenced by its location within the liver and the operator's skill level.[15] This technique seems to have low recurrence rates between 0% and 13.8%.[19] Recurrence of treated cysts can be caused by several factors such as inadequate unroofing, performing the procedure on recurrent cysts with potential adhesion formation, and cysts that are deep-seated or situated in the liver's posterior segments.[15]

The 2015 American Diabetes Association guideline recommended that bariatric surgery should be considered in patients with severe obesity (BMI ≥35 kg/m^2) and obesity-related complications including type 2 diabetes mellitus which are challenging to control with lifestyle modification and pharmacological therapy.[20] The two main surgical procedures regarded as the standard of care for weight-loss surgery are laparoscopic Roux-en-Y gastric bypass (LRYGB) and laparoscopic sleeve gastrectomy (LSG).[21] LRYGB is still considered the gold standard for weight-loss susrgery.

This procedure involves two main steps: creating a small gastric pouch by separating the cardia from the rest of the stomach, and dividing the small intestine 30–50 cm below the ligament of Treitz. The distal end of the divided intestine, known as the Roux limb, is brought up in an antecolic fashion and connected to the new gastric pouch. This complex surgery involves rerouting the intestines, which may lead to long-term vitamin and mineral deficiencies, longer hospital stay, and has a higher rate of perioperative complications. Meanwhile, LSG only involves removing approximately 80% of the lateral aspect of the stomach vertically, leaving a long, tubular gastric sleeve. This procedure induces rapid and substantial weight loss comparable to that of LRYGB and does not cause vitamin and mineral deficiencies.[22]

Our case may suggest a possible guide for surgeons who are sought to surgically treat patients with morbid obesity and multiple liver cysts. However, a comprehensive long-term follow-up is essential to evaluate whether the procedure contributes to the improvement of radiologic and laboratory outcomes.

CONCLUSION

Sleeve gastrectomy and liver cyst unroofing may provide a possible treatment strategy for patients presented with morbid obesity and multiple liver cysts. Further research is needed to compare pre- and post-operative liver imaging and laboratory results and analyze the relationship between liver cyst and obesity.

Patient consent for publication
Patient/guardian consent obtained.

Disclosure
The authors declare that they have no conflict of interest.

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