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## **Case Report**

# Computed tomography demonstration of cholecystogastric fistula

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#### ABSTRACT

Cholecystogastric fistula is a rare complication of chronic cholecystitis or long-standing cholelithiasis. It results from the gradual erosion of the approximated, chronically inflamed wall of the gall bladder and stomach with fistulous tract formation. The present case describes the direct visualization of a cholecystogastric fistula by computed tomography in a patient without prior biliary system complaints.

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## Introduction

Cholecystoenteric fistulas include cholecystogastric, cholecystoduodenal, and cholecystocolonic fistulas with the cholecystoduodenal type being the most common [1]. The symptoms and signs of these fistulas may range from nonspecific to life-threatening [1–10]. They are usually related to chronic cholecystitis or long-standing cholelithiasis. The computed tomography (CT) manifestations of a bilioenteric fistula include pneumobilia, 2 approximated organs with an edematous wall, pericholecystic inflammatory change, a gall stone in the gastrointestinal tract, bowel dilatation, and direct visualization of the fistula [1-6]. A primary demonstration of cholecystoduodenal fistula has been reported [7-10]. In the following account, a patient without prior symptoms or signs of cholelithiasis was shown by CT to have a fistulous tract communicating the gall bladder and gastric antrum.

## Case report

A 63-year-old woman was a victim of sigmoid colonic mucinous adenocarcinoma. She received a lower anterior resection with end-to-end anastomosis about 2 years ago. One year later, a regular follow-up CT examination demonstrated an air-distended channel communicating the gastric antrum and gall bladder on reformatted coronal and sagittal images (Figs. 1 and 2) with pneumobilia. A mass with a complete thick rim calcification, about 78  $\times$  45  $\times$  36 mm in dimension, was noted in the pancreaticoduodenal region. The fat plane between the mass and the fistula was well preserved. The patient said she underwent an operation 40 years ago, before CT was available, to determine the nature of the mass. However, the mass was thought to be a calcified lymph node and was not resected. The patient received follow-up during the 40year period without further treatment. The gall bladder and gastric wall were not thickened. No visible peritoneal implant

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Fig. 1 – (A, B) Two contiguous reformatted coronal images on first follow-up CT examination 1-year after lower anterior resection of sigmoid colonic carcinoma showed the vertically oriented air-distended fistula (arrow) between the gall bladder (G) and gastric antrum (GA) with pneumobilia (arrowhead).

was detected. The patient denied any past complaints related to the biliary system. Neither ultrasonography nor CT showed recognizable cholelithiasis. The fistula was not described in the surgical record of the lower anterior resection 1 year ago. Because of the absence of biliary or gastrointestinal complaints, no further study was performed. This time, 1 year after the first follow-up CT examination, blood analysis detected an elevated serum CA-125 level, 362.7 U/mL (normal level is <35 U/mL). A screening ultrasonography showed ascites and pneumobilia. Subsequent abdominal cytology confirmed the presence of malignant cells. The patient received a second follow-up CT examination, which showed reticulonodular infiltrates in the greater omentum, pneumobilia, and ascites. The previously demonstrated cholecystogastric fistula was collapsed and appeared as an enhancing tubular tract (Fig. 3) without air inside. A following endoscopic examination revealed a hole on the anterior wall of the gastric antrum with mild mucosal inflammation and bile flowing out. A biopsy of the tissue around the opening showed chronic gastritis with intestinal metaplasia. Then, the



Fig. 2 – (A, B) Two contiguous reformatted sagittal images showed the vertically oriented air-distended fistula (arrow) between the gall bladder (G) and gastric antrum (GA). A calcified mass (CAL) in the pancreatioduodenal region, pneumobilia (arrowhead), and air-fluid in the gall bladder were seen. The fat plane between the calcified mass and the fistula was well preserved.

patient received cytoreduction surgery and hyperthermic intraperitoneal chemotherapy with oxaliplatin. The fistula itself remained unrepaired, and the gall bladder was not resected. The calcified mass was left untouched. The pathology of multiple resected tissues on the surfaces of the liver, spleen, stomach, diaphragm, omentum, and appendix all revealed metastatic adenocarcinoma. She recovered uneventfully and received regular follow-up in the outpatient department. No specific biliary system complaint was mentioned during the follow-up period.

### Discussion

Cholecystogastric fistula usually is a complication of longterm cholelithiasis or chronic cholecystitis with subsequent gall stone ileus. In the present case, the patient had not presented any biliary or epigastric complaints according to the clinical information. Ultrasonography and CT showed only



Fig. 3 – (A) A reformated coronal CT image 1-year after those images in Figures 1 and 2 showed an enhancing tract (arrow) between the gall bladder (G) and gastric antrum (GA). The fistulous tract was rather regular and smooth. (B) A postcontrast axial CT image showed a round enhancing nodule (arrow), which represents a cross-section appearance of the fistula, beside the gastric antral wall (W). A calcified mass (CAL) in the pancreatioduodenal region was seen. The fat plane between the calcified mass and the fistula was well preserved.

pneumobilia without recognizable cholelithiasis. The gall bladder and gastric wall were not edematous or thickened. These appearances suggested that there was no obvious inflammation near the fistula. The fistula itself did not seem to cause serious suffering for the patient. Although the operative and pathologic findings confirmed metastatic adenocarcinoma along the lesser curvature of the stomach, the biopsy of the gastric mucosa at the fistulous opening showed only chronic gastritis and intestinal metaplasia without malignant cells. The exact cause of this fistula may not be ascertained. Because it was not mentioned in the first colectomy procedure, it might have occurred during the 1-year period between surgery and the first follow-up CT examination.

From the imaging point of view, a clear delineation of the fistulous tracts of various kinds of abdominal fistulas on

cross-sectional scans was usually difficult to achieve because of the bizarre and irregular routes of the fistulas. The reported CT appearances of cholecystogastric fistulas included a slight deficiency of the gall bladder wall [1] and close adherence of the edematous wall of the gastric antrum and the thickened wall of the gall bladder fundus [4]. In the present case, the gall bladder and stomach were not closely adhered together, and the wall was neither edematous nor thickened. The reformatted coronal and sagittal images clearly demonstrated the cephalocaudal-oriented channel and made for an undoubted diagnosis of cholecystogastric fistula. This demonstration was aided by the air distension of the fistula. If the fistulous tract was collapsed as in the second follow-up CT, the enhancing tubule-like channel (Fig. 3) between the gall bladder and stomach might suggest the possibility of a fistula when pneumobilia was noted. In addition, the fistulous tract appeared rather regular and smooth, making the possibility of tumor infiltration less likely.

The therapeutic strategy includes 1-stage or 2-stage stone removal, fistula repair and cholecystectomy, laparoscopic cholecystoenteric fistula transection, laparoscopic intraperitoneal suturing of the fistulous tract, endoscopic treatment, or only stone removal without fistula repair and cholecystectomy [1]. In this report, considering the patient's general condition, the surgeons left the fistula unrepaired, and the gall bladder not resected. The postoperative course was uneventful.

Theoretically, the fistulous tract would be shown more definitively by percutaneous transhepatic cholangiography, endoscopic retrograde cholangiopancreatography, or magnetic resonance cholangiopancreatography. However, these modalities are more invasive and time consuming. The present case indicates that a cholecystogastric fistula may occur without obvious symptoms or signs related to chronic cholelithiasis and, in appropriate conditions, may be demonstrated definitively in a routine, readily available CT examination.

#### REFERENCES

- Boland MR, Bass GA, Robertson I, Walsh TN. Cholecystogastric fistula: a brief report and review of the literature. J Surg Case Rep 2013;2013(4). http://dx.doi.org/ 10.1093/jscr/rjt028.
- [2] Pickhardt PJ, Friedland JA, Hruza DS, Fisher AJ. Case report. CT, MR cholangio-pancreatography, and endoscopy findings in Bouveret's syndrome. AJR Am J Roentgenol 2003;180:1033–5.
- [3] Nakamura M, Hamanaka Y, Kawamura A, Suzuki T. Successful preoperative diagnosis of a cholecystogastric fistula using endoscopic retrograde cholangiography: report of a case. Surgery Today 1997;27:567–70.
- [4] Arioli D, Venturini I, Masetti M, Romagnoli E, Scarcelli A, Ballesini P, et al. Intermittent gastric outlet obstruction due to a gallstone migrated through a cholecysto-gastric fistula: a new variant of 'Bouveret' syndrome. World J Gastroenterol 2008;14:125–8.
- [5] Lassandro F, Gagliardi N, Scuderi M, Pinto A, Gatta G, Mazzeo R. Gallstone ileus analysis of radiological findings in 27 patients. Eur J Radiol 2004;50:23–9.
- [6] Lowe AS, Stephenson S, Kay CL, May J. Duodenal obstruction by gallstones (Bouveret's syndrome): a review of the literature. Endoscopy 2005;37(1):82–7.

- [7] Negi RS, Chandra M, Kapur R. Bouveret syndrome: primary demonstration of cholecystoduodenal fistula on MR and MRCP study. Indian J Radiol Imaging 2015;25(1):31–4.
- [8] Inal M, Oguz M, Aksungur E, Soyupak S, Boruban S, Akgul E. Biliary-enteric fistulas: report of five cases and review of the literature. Eur Radiol 1999;9:1145–51.
- [9] Delabrousse E, Bartholomot B, Sohm O, Wallerand H, Kastier B. Gallstone ileus: CT findings. Eur Radiol 2000;10:938–40.
- [10] Lassandro F, Romano S, Ragozzino A, Rossi G, et al. Role of helical CT in diagnosis of gallstone ileus and related conditions. AJR Am J Roentgenol 2005;185:1159–65.