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# Computed Tomography Findings in a Case Of Gastric Duplication Cyst

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## ABSTRACT

**Introduction:** gastric duplication cysts comprise a rare congenital anomaly constituting 8% of total gastrointestinal tract duplications. They may be associated with complications, or may be discovered incidentally. This case report illustrates the same, in which an adult female had presented with vague abdominal complaints. Subsequently, a computed tomography (CT) scan had revealed a cystic lesion adjacent to the stomach. She was treated surgically.

**Keywords:** Gastrointestinal; Duplication; Cyst; Complications; Differential diagnosis.

## Introduction

Duplication cysts can occur in any part of the gastrointestinal tract and are described according to the viscus that they are in close proximity with. [1] They are usually asymptomatic. Gastric duplication cysts are most commonly seen close to the greater curvature[2]. They present with gastrointestinal bleed due to ulceration, abdominal pain, vomiting, or a mass[2,3]. The typical CT imaging findings along with a brief discussion has been mentioned in this case report.

## Case Presentation

A forty-two-year female presented with a complaint of heartburn of one-month duration. She did not have any history of vomiting, diarrhea, fever, weight loss, hematemesis, or melena. She did not have any abdominal surgery in the past. Her routine blood investigations and ultrasound of the abdomen did not reveal any abnormality. A CT of the abdomen with oral and intravenous contrast was performed.

A well-defined thin-walled, homogeneous, cystic lesion (0-20 HU) of size 61x57x46 mm was seen in the left posterolateral peri gastric region, adjacent to the gastroesophageal junction.(Fig 1)

The cyst showed homogenous wall enhancement. It did not have any internal solid components or septations or calcifications within it. (Fig 2)

The left adrenal gland was visualized separately from the cyst. (Fig 3)

The cystic lesion was seen to cause extrinsic compression and mild inferior displacement of the upper pole of the left kidney, superior and anterior displacement of the posteroinferior stomach wall, and lateral displacement of the upper pole of the spleen. However, the fat planes with adjoining organs were maintained. (Fig 4)

A diagnosis of gastrointestinal duplication cyst was made, likely gastric duplication cyst. Laparoscopic resection of the mass was done. On histopathological

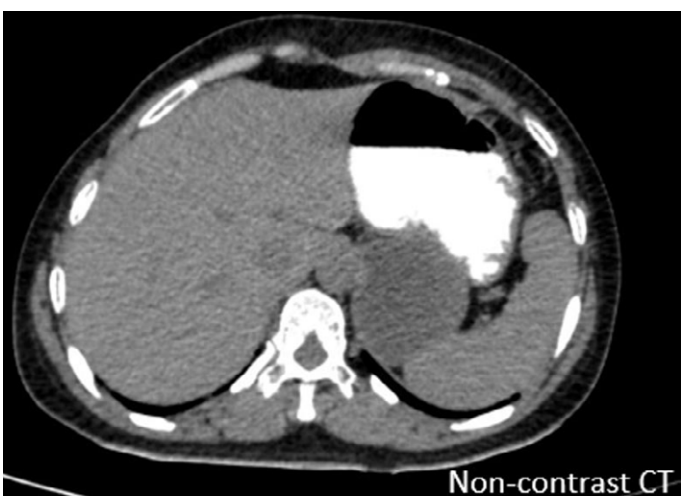


**Figure 1.** Axial image of non-contrast CT abdomen shows a homogeneous, cystic lesion in the peri gastric region, adjacent to the gastroesophageal junction. It did not show any calcifications.

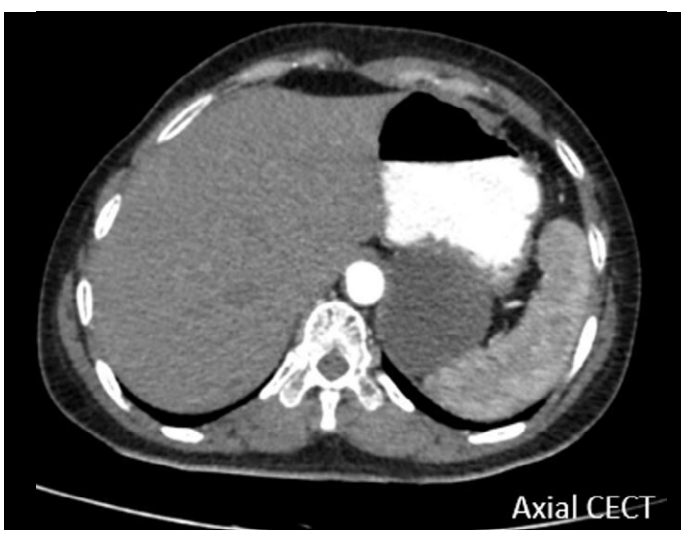


**Figure 2.** Axial image of CECT abdomen in the arterial phase shows no enhancing solid components or septations within the cyst.

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evaluation, it was confirmed to be gastric duplication cyst with mucosal and submucosal architecture similar to that of the stomach. No evidence of inflammation/ dysplasia/heterotopic tissue was noted.

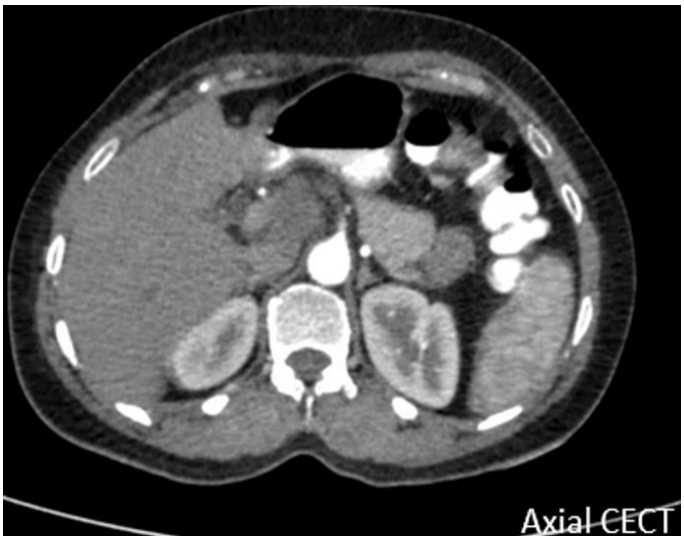


**Figure 2**. Axial image of CECT abdomen in the arterial phase shows a normal left adrenal gland, which is separate from the above-mentioned cyst.

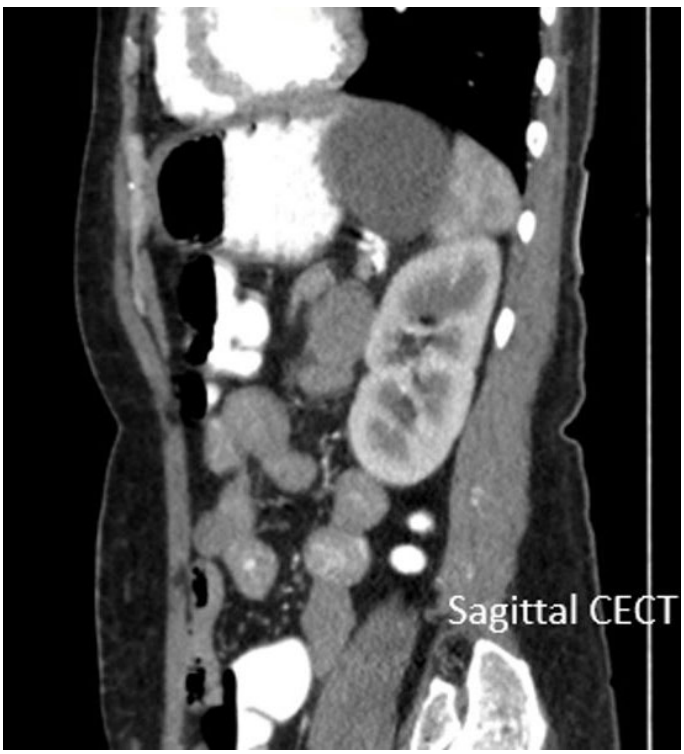


**Figure 4.** A sagittal image of the CECT abdomen in the arterial phase shows the anatomical relationship of the cyst with the stomach, the spleen, and the left kidney.

## Discussion

Gastrointestinal tract duplication cysts in adults are quite rare. The most common site is the ileum, followed by the esophagus, jejunum, colon, stomach, and appendix. The criteria which must be met for diagnosis include[1,3].

1) continuity of cyst wall within the stomach.

2) coat of shared smooth muscles around cyst.

3) cyst and stomach share common blood supply.

4) cyst has epithelial lining of gastrointestinal tract.

There are numerous hypotheses expounding how duplication cysts form, such as incomplete twinning, ischemic episodes in utero , a persistent embryological diverticulum, or abnormal recanalization of the digestive tract[2].

Only 8% of gastrointestinal tract duplications are gastric duplications[2]. While gastric duplication cysts typically occur along the larger curvature, duplication cysts of the ileum are typically found along the mesenteric border. Gastric duplication cysts come in two forms: cystic when the lumen is not contiguous with the stomach lumen and tubular when the lumen is continuous with the stomach lumen. Most gastric duplications (> 80%) are cystic and don't communicate with the stomach lumen.

The hallmark of gastric duplication cyst on histopathology is that any type of gut tissue may be seen lining the cyst (eg: gastric mucosa, colonic mucosa ,jejunal mucosa, etc). Heterotopic tissue such as ectopic pancreatic tissue and respiratory tract epithelium have been described[2,3].

Symptoms, if present can be in the form of abdominal fullness, vomiting, gastrointestinal bleed, and abdominal pain. A rare presentation of rectal bleeding in an infant has been described previously in the literature[4]. A case of gastrointestinal duplication cyst causing gastric outlet obstruction in adult was reported in Pakistan[5].

Gastric duplication cysts appear as well-defined cystic lesions on ultrasonography, however, this modality has a low sensitivity for their diagnosis. An inner hyperechoic mucosal lining with an outer hypoechoic muscle layer ("double wall sign") is very characteristic. Internal echoes and septations may be present. CT is the investigation of choice, and usually shows a cystic lesion adjacent to the greater curvature of the stomach. On magnetic resonance imaging (MRI) the lesions are T2 hyperintense but may show variable signal intensity in case of complicated cysts[5,6]. Endoscopic ultrasound has also been described to be a very good modality of investigation and is superior to conventional abdominal ultrasound in demonstrating the cyst wall[6].

Differential diagnoses include-pancreatic pseudocysts, other enteric duplication cysts, abscesses, mucinous cystadenoma of the pancreas, gastrointestinal stromal tumors, and cystic adrenal lesions. Few authors have described a case of gastric duplication cyst mimicking a cystic lymphangioma[7,8]. Development of malignant transformation is rare. Adenocarcinoma, squamous cell carcinoma, neuroendocrine carcinoma, leiomyoma and Gastrointestinal stromal tumour (GIST) have been reported in literature[9].

Complete surgical removal with resection of the common wall between the cyst and the stomach has been advised to prevent recurrence and complications[8,9].

So when evaluating a cystic lesion adjacent to the wall of the stomach, gastric duplication cyst should be in the differential list. Imaging alone cannot provide a definitive diagnosis and histopathological analysis should be done for confirmation. Due to the possible complications and the risk of malignant transformation, surgical resection remains the mainstay of treatment.

**Gastric duplication cyst: Differential diagnosis (Adapted from Gandhi *et al* [9])**

| Diagnosis | Abdominal radiograph | Computed tomography | Magnetic resonance imaging |
|---|---|---|---|
| Gastric duplication cyst | Soft-tissue mass that displaces air-filled bowel loops. Peripheral rim calcification ±. | Fluid-attenuated cystic mass seen in close contact with stomach. They usually do not communicate with stomach. | Cyst demonstrates high signal intensity on T2 low signal intensity on T1 weighted images. |
| Pancreatic pseudocyst | Nonspecific. Gastrocolic separation sign* may be seen in large pseudocyst. | Well circumscribed peripancreatic fluid collection with homogeneously low attenuation and a well-defined enhancing wall | Cyst demonstrates high signal intensity on T2 with layering of dependent debris. The cyst wall shows mild early enhancement which becomes more intense progressively . |
| Mucous cystadenoma of the pancreas | | Uusally appear as multilocular (< 6 loculations) macrocystic lesion in the pancreatic parenchyma; may be unilocular. On contrast administration, there is enhancement of the cyst wall and septations ,and mural nodule (if any). Peripheral wall calcification ±. | Well circumscribed unilocular or multilocular macrocystic lesion. Different locules may show disparate signal intensity owing to different mucin content. Cystic fluid usually appears homogeneously hyperintense on T2 and hypointense to mildly hyperintense on T1 weighted images. |
| Cystic lymphangioma (Omental or mesenteric) | Increased soft-tissue density (epigastric region/ left upper quadrant) with displacement of bowel gas. | Well circumscribed thin walled cystic lesion with enhancement of cyst wall and septa on contrast administration. May show homogeneous (low) fluid attenuation. Fluid-fluid/Fat-fluid level and internal septations ±. | Usually shows high signal intensity on T2 and low to isointense signal on T1-weighted images. It can show high signal intensities on both T1- and T2-weighted images, presumably due to the different ratios of fat ,fluid, , and hemorrhage within the cyst. |

*Gastrocolic separation sign : Increased distance between the transverse colon and the stomach on Abdomen X ray. This may occur due to increased fluid in the lesser sac

## Mini Curriculum and Author's Contribution

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2. Niharika Prasad – MBBS; MD; FRCR Contribution: involved in diagnosis, preparation and draft of the manuscript , critical review and final approval. The manuscript has been read and approved by all the authors, the requirements for authorship in this document have been met, and each author believes that the manuscript represents honest work Informed consent was taken from the patient for use of radiology images for educational purpose. Case study, preparation and draft of the manuscript. ORCID: 0000-0003-4261-1910

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