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Complicated gastric duplication cyst presenting as cystic intraperitoneal collection: a case report

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Abstract

Background: Alimentary tract duplications are rare anomalies and any delay in the diagnosis may develop various complications. Infection, hemorrhage, or perforation of the duplication cyst may lead to an acute presentation. Occasionally, it may lead to a diagnostic and management dilemma. Herein, we report an unusual complication of gastric duplication cyst.

Case presentation: A 2.5-year-old girl presented with recurrent abdominal distension, fever, and abdominal pain. The imaging workup revealed a huge intraperitoneal collection. Intraoperatively, a huge pseudocyst was encountered communicating with the gastric duplication cyst. The gastric duplication cyst was sharing a common wall with the greater curvature of the stomach but was not communicating with the gastric lumen. Pseudocyst along with gastric duplication cyst was completely excised. The resultant seromuscular defect of the stomach was also closed. The postoperative period was uneventful.

Conclusion: Perforation of the gastric duplication cyst should be kept in differentials of intraperitoneal collection not amenable to multiple aspirations. Huge intraperitoneal collection secondary to perforation of gastric duplication is exceedingly rare and scarcely reported in the literature.

Keywords: Gastric duplication cyst, Intraperitoneal collection, Pseudocyst, Liver abscess, Case report

Background

Alimentary tract duplications are rare anomalies and commonly diagnosed in the first few years of life [1]. Delayed diagnosis or misdiagnoses often leads to the occurrence of complications [2]. Gastric duplications cyst accounts for 4–7% of alimentary tract duplications. It may develop complications such as infection of the cyst, peritonitis secondary to its perforation, and hemorrhage [3, 4]. Herein, we present a unique presentation of complicated gastric duplications cyst that proved a diagnostic as well as management dilemma.

Case presentation

A 2.5-year-old girl presented in the outpatient department with progressive abdominal distension for the last 6 months, and abdominal pain (appreciated as inconsolable cry), and fever for the last 5 days. Past medical history showed that the girl initially presented at the age of 1 year with fever and abdominal pain in the Gastroenterology Department. Ultrasound followed by CT scan (Fig. 1) of the abdomen was performed which gave a suspicion of liver abscess. The abscess was aspirated under ultrasound guidance, and a pigtail catheter was inserted. The patient was discharged in good condition. However, a month later, the patient again presented with an epigastric swelling in addition to abdominal pain and fever. Examination revealed a fluctuant inflammatory epigastric swelling with upper

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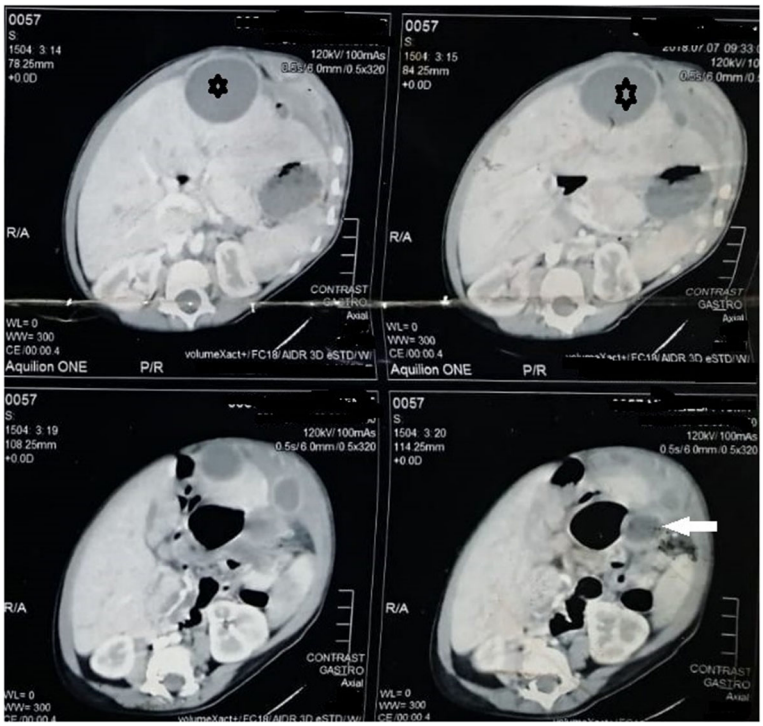

Fig. 1 Showing a well-circumscribed collection in the left lobe of the liver (*). Note a hypodense area in relation to stomach representing gastric duplication cyst (white arrow)

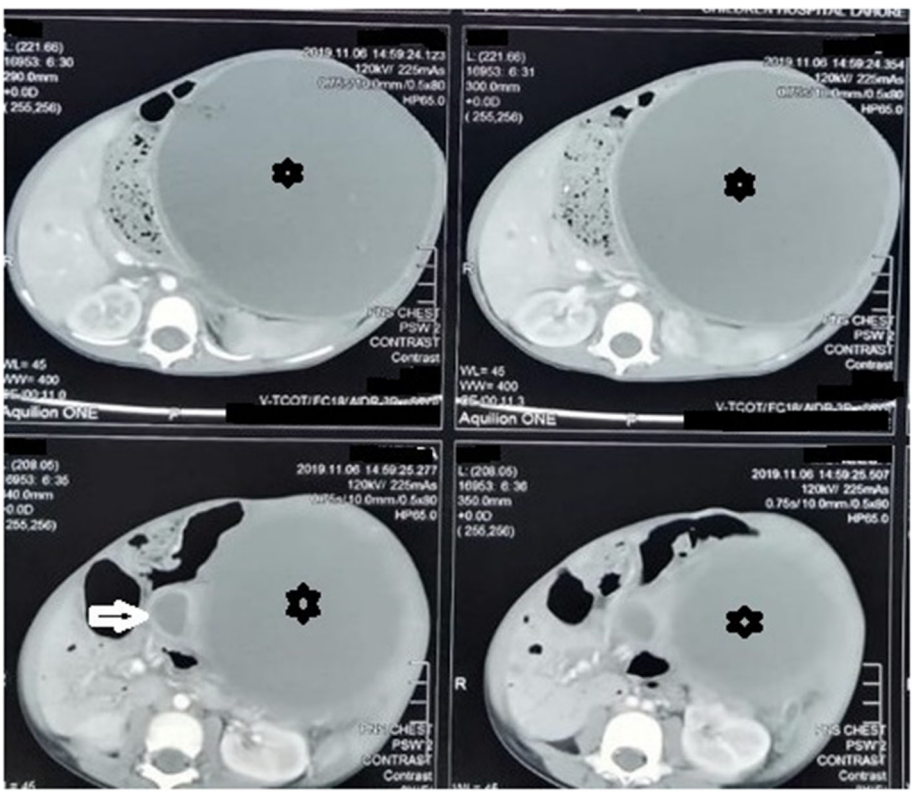

Fig. 2 Showing a huge cystic collection in the abdomen (*). Note a hypodense area in relation to stomach representing gastric duplication cyst (white arrow)

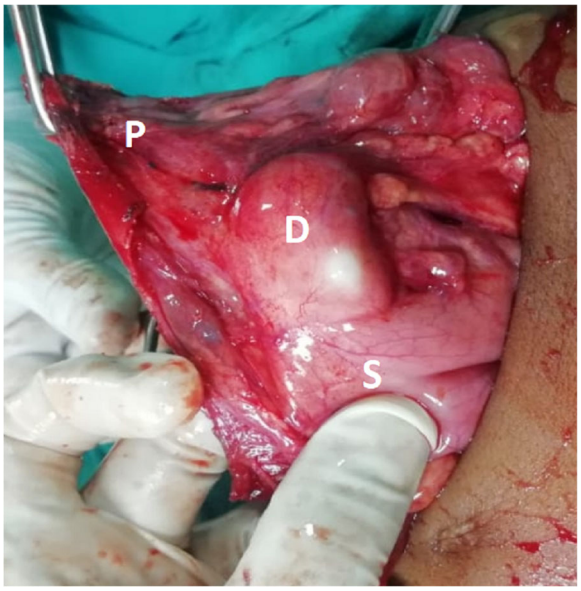

Fig. 3 Intraoperative photograph showing gastric duplication (D) intimately attached to the greater curvature of the stomach (S). The opened pseudocyst (P) is also visible

abdominal distension. CT scan performed again and showed a residual abscess in the left lobe of the liver, tracking into the epigastrium. The patient was shifted to the Pediatric Surgery Department where open drainage of the abscess was done. About 150 ml frank pus was drained. Postoperatively, the fever did not settle; follow-up ultrasound revealed residual abscess which was aspirated (ultrasound-guided). The histopathology showed a pyogenic abscess, but no organism could be detected on cultures. The patient was then discharged in good condition.

During current admission, she was febrile with the following vitals: temp 101 °F, pulse 116/min, R/R 24/min, and BP 90/60. The abdomen was distended with mild tenderness in the upper abdomen; a cystic mass (14 × 10 cm) was palpable in the epigastrium and left hypochondrium. The lower abdomen was soft with normal bowel sounds. The rest of the systemic examination was unremarkable. The patient was admitted to the ward and an ultrasound was planned, but during admission, the patient became suddenly pale with accentuation of abdominal distension. The CBC which was initially 8 g/dl dropped to 3 g/dl when repeated. The patient also developed tachycardia and tachypnea. The patient was managed with IV fluids and packed red blood cells were transfused. After stabilization, an urgent CT scan was performed which showed a cystic intraperitoneal collection (Fig. 2).

The patient underwent exploratory laparotomy electively using a supraumbilical transverse abdominal incision. There was a huge cyst in the epigastrium and left hypochondrium, filled with hemorrhagic fluid. The cyst was aspirated to assist its dissection from surrounding viscera. The cyst had communication with another smaller cyst that was intimately attached to the greater curvature of the stomach (Fig. 3). Both cysts were excised leaving behind a small seromuscular defect of the greater curvature of the stomach which was repaired with a single layer of interrupted sutures. Postoperative recovery was uneventful, and the patient was discharged in good clinical condition on the 7th postoperative day. Figure 4 describes the timeline of the events. The histopathology of the bigger cyst divulged as a pseudocyst, whereas that of the smaller cyst as gastric duplication cyst. The patient is doing fine on a follow-up of 12 months.

Discussion

Alimentary tract duplications are characterized by intimate contact with any part of the gastrointestinal tract (GIT), smooth muscles in the wall, and lined by the mucosa of GIT. These are named after the part to which they are intimately attached [1]. Gastric duplication cysts are usually attached to the greater curvature of the stomach and often do not communicate with the gastric lumen [5]. In the present case, the gastric duplication cyst was not communicating with the gastric lumen and fulfilled all the criteria of a classical GIT duplication cyst.

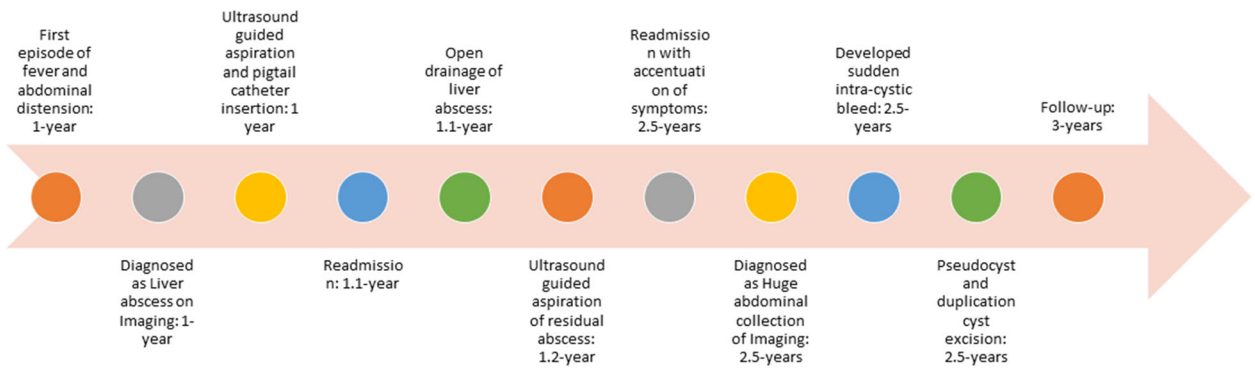

Fig. 4

Table 1 Showing the summary of cases of perforated gastric duplications cyst found on literature search

Study	Age/sex	Presentation	Site/communication#	Findings/procedure	Pancreatic tissue^	Outcome	Follow-up
Kayastha et al. 2010 [1]	1.5 years/M	Fever, abdominal pain, and distension for 2 days	Greater curvature/NC	Perforated gastric duplication with peritonitis/partial cyst excision and mucosal stripping of common wall	No	Survived	6 months
Surridge et al. 2014 [2]	13 months/ NM	Bleeding per-rectum, anemia, malnutrition	NM/NC	Perforated gastric duplication cyst eroding the right lobe of liver and hepatic flexure of the colon/excision with colectomy	Yes	Survived	NM
Faerber et al. 1993 [3]	2 years/F	Recurrent abdominal pain, anemia, and hemoptysis	NM/NC	Perforated gastric duplication having fistula with lower lobe of left lung/left lower lobectomy, excision of the cyst, splenectomy, and distal pancreatectomy	Yes	Survived	NM
Tatekawa et al. 2008 [4]	2.5 years/M	Abdominal pain and vomiting	Isolated GDC/NC	Isolated gastric duplication perforated to form an omental pseudocyst. Both cysts were communicating with each other/excision	No	Survived	NM
Zhang et al. 2017 [5]	7 days/F	Signs of intestinal obstruction and peritonitis	Greater curvature	Collection of purulent and brownish fluid in peritoneal cavity, and perforated gastric duplication cyst/excision of the duplication cyst with partial gastrectomy	No	Survived	2 months
Zhang et al. 2017 [5]	9 months/F	Melena for 3 days	Greater curvature	The cyst had a fistulous communication with transverse colon/partial gastrectomy, cyst excision, and localized transverse colon excision	No	Survived	3 years
Ratan et al. 2002 [17]	5 days/M	Irritability and abdominal distension for 3 days	Greater curvature/C	Due to birth trauma and resuscitation, both the stomach and GDC were lacerated/gastrocystostomy	No	Expired	NM
Rao et al. 2003 [18]	8 months/ M	Refusal of feedings, irritability, and excessive crying of 1 week, and massive bleeding per rectum for 3 days	Isolated intrapancreatic/NC	The isolated GDC had fistulous communication with jejunum secondary to the GDC ulcer perforation into the jejunum/excision with pancreatectomy of tail and body, splenectomy, and resection of jejunal portion	No	Survived	4 years
Cloutier R 1973 [16]	16 months/ M	Intermittent vomiting, bulge in epigastrium	Greater curvature/NC	The GDC perforated into the pancreas forming a pseudocyst of the pancreas/mucosal stripping of GDC, and partial cystectomy and drainage for pseudocyst	NM	Survived	NM
Marugami et al. 2010 [19]	9 months/F	Progressive vomiting and diarrhea	Multiple along antrum/NC	Total of 4 GDC, 2 were perforated/cyst excision	Yes in perforated cysts	NM	NM
Koumanidou et al. 1999 [20]	11 months/ F	Vomiting, abdominal pain, and fever for 2 days	Multiple along antrum and pylorus/NC	Two GDCs, one was perforated/excision	Yes in perforated cyst	Survived	NM
Belhassen et al. 2019 [21]	3 months/F	Case of anorectal malformation, cyst identified during workup of associated anomalies	Greater curvature/NC	Cyst along greater curvature with a small perforation clogged by omentum/excision with repair of seromuscular gastric defect	No	Survived	1 year
Sieunarine et al. 1989 [22]	5 years/M	Acute abdomen after abdominal blunt trauma	Antrum and pylorus/NC	GDC appeared leaked due to trauma/excision	No	Survived	NM
Kesieme et al. 2012 [10]	2.5 years/F	Massive bleeding PR, enterocutaneous fistula	Greater curvature/NC	GDC perforated to open into the descending colon which further erodes the spleen and form colo-cutaneous fistula with the anterior chest wall/excision, and divided colostomy	Yes in the tract	Survived	NM
da Costa et al. 1993 [11]	5 months/F	Massive bleeding PR	Greater curvature/NC	GDC perforated to the transverse colon/Excision	Yes	Survived	NM

Table 1 Showing the summary of cases of perforated gastric duplications cyst found on literature search *(Continued)*

Study	Age/sex	Presentation	Site/communication#	Findings/procedure	Pancreatic tissue^	Outcome	Follow-up
Mahnovski et al. 1998 [12]	11 months/F	Massive bleeding PR	Greater curvature/NC	GDC has fistula with transverse colon/partial gastrectomy and cystectomy with localized colectomy	No	Survived	NM
Sieber et al. 1972 [13]	10 months	Chest infections, GIT bleeding	Greater curvature/NC	GDC perforated through spleen and diaphragm to the left lower lobe of lung/left lower lobectomy, splenectomy, and cystectomy	NM	NM	NM
Kleinhaus et al. 1981 [14]	5 weeks/F	Vomiting diarrhea, progressive abdominal distension	Greater curvature/NC	GDC was perforated with intraperitoneal hemorrhage/cyst excision	No	Survived	NM
Menon et al. 2004 [15]	2 years/M	Vague abdominal pain, cough, hemoptysis	Greater curvature/NC	GDC was forming fistula through diaphragm to the left lung/cyst and tract excision	No	Survived	1 year
Bonacci et al. 2008 [7]	8 months/M	Irritability, recurrent hematemesis, and failure to thrive	Greater curvature/NC	GDC perforated to anterior abdominal wall/excision	Yes	Survived	1 month
Shinnick et al. 2018 [8]	8 weeks/M	Failure to thrive	4 GDCs along greater curvature and pylorus/one was communicating	4 GDC, 1 esophageal, and 3 along the stomach. The one along pylorus was perforated /excision with closure of gastric communication	NN	Survived	NM
Berri et al. 2020 [9]	35 years/M	Progressive abdominal pain, nausea, vomiting, and weight loss	Posterior antrum/NC	GDC perforated to the transverse colon/cystectomy and colectomy	No	Survived	3 months

^Pancreatic tissue in the cyst on histopathology
#Site of origin from the stomach and status of communication with the gastric lumen
NM not mentioned, *GDC* gastric duplication cyst, *PR* per rectum, *NC* non communicating

Gastric duplication cyst often presents variably ranging from merely incidental finding to as severe as acute peritonitis or hemorrhagic shock. Those arising from the antropyloric region may impinge the gastric outlet and thus present with vomiting. Few communicating gastric duplication cysts may present with hematemesis [6]. Infection or perforation of the cyst may result in an acute abdomen, thus necessitating urgent surgical intervention [1]. Occasionally, the patient may develop anemia secondary to spontaneous bleeding within the cyst. In the present case, multiple complications were encountered accounting for delayed as well as inappropriate management. Most plausibly, a perforation of gastric duplication cyst brought about peritonitis which was initially simulated liver abscess; later, it might have developed a huge pseudocyst that masqueraded the associated gastric duplication cyst.

The diagnosis can be based on imaging studies. X-rays may show the mass effect of large duplication cyst but unable to confirm the diagnosis. Ultrasound abdomen may aid in diagnosis by showing gut signature sign of the cyst, but this is an operator-dependent modality. A contrast-enhanced CT scan is an investigation of choice for the diagnosis of GIT duplications. It will show relations of the cyst with the surrounding viscera. Any complications if present will also be delineated well by this modality [6–8].

The present case was a diagnostic as well as a management challenge. On initial presentation, it was reported as hepatic abscess and dealt with erroneously. Subsequently, the patient developed sudden accentuation of cyst size due to intracystic bleeding as depicted by the appearance of sudden pallor in the present case. CT scan again could not identify the gastric duplication though on the retrospective review of the CT films, a hypodense cystic structure could be seen in relation to the stomach (Fig. 1 and 2).

An extensive literature review was performed regarding the perforated gastric duplication cyst. About 22 cases of perforated gastric duplication could be retrieved (Table 1). The gastric duplication cyst after perforation may either cause peritonitis [1] or it may develop fistulous communication with the structures in the vicinity. The fistulous communications are reported with the colon, pancreas, spleen, anterior abdominal wall, and lower lobe of the left lung through the diaphragm [9–15]. Interestingly, 2 cases of pseudocysts formation are also reported as a complication of perforated gastric duplication cyst [4, 16].

The ultimate management is complete surgical excision as malignant transformations in gastric duplications have been reported. The excision may involve a partial gastrectomy if a small gastric area is involved [12]. In case of extensive gastric attachment, excision of the free part and mucosal stripping of the common wall is preferred [1]. In the present case, the gastric duplication was completely excised leaving behind a serosal defect which was repaired.

Conclusion

Complications in gastric duplication cyst may lead to misdiagnosis and maltreatment. Careful reporting of imaging investigations is required to identify these lesions as they can masquerade the actual pathology leading to diagnostic and management issues.

Abbreviations

CT scan: Computerized tomography scan; CBC: Complete blood count; R/R: Respiratory rate; BP: Blood pressure; GIT: Gastrointestinal tract

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Authors' contributions

MBM along with AS, and NT, drafted the manuscript and performed the literature review. NM was the operating surgeon and contributed in the manuscript drafting. AI wrote the radiological section in addition to major contribution in manuscript drafting. MH wrote the histopathological section in addition to major contribution in manuscript writing. ZF wrote the gastroenterology section in addition to major contribution in manuscript drafting. The authors read and approved the final manuscript.

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Ethics approval and consent to participate

NA

Consent for publication

Informed written consent from parents has been taken and can be sent when required.

Competing interests

None.

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