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Case report: Gastric duplication cyst diagnosed prenatally: A challenge of diagnosis

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Gastric duplications are rare congenital alimentary tract anomalies, and only a limited number of cases have been reported in newborns. We report a case of a gastric duplication cyst suspected antenatally. We highlight the difficulties encountered in establishing the diagnosis by imaging alone, because the diagnosis indicated by imaging is sometimes inconclusive and therefore histology remains the best choice to confirm the diagnosis.

Keywords: duplication cyst, gastrointestinal, neonates

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Gastrointestinal duplication (GID) cysts occur in approximately one in 10 000 newborn infants,[1,2] and may occur at any site along the alimentary tract. Gastric duplication cysts (GDCs) constitute 2 - 7% of all GIDs,[3] and are usually located on the greater curvature and have no communication with the gastric lumen. GID is diagnosed most commonly in the first 2 years of life. Early diagnosis and surgical correction in the neonatal period are usually advocated to avoid potential morbidity and mortality.

Written informed consent was obtained from a legally authorised representative(s) for anonymised patient information to be published in this article.

Case report

A female infant was born via normal vaginal delivery at 38 weeks' gestation, and her birthweight was 3 500 g. An antenatal ultrasound showed a round anechoic cystic lesion abutting the gastric fundus. This cystic mass exhibited two distinct walls with a hyperechoic inner layer and a hypoechoic outer layer (Fig. 1).

On postnatal examination, a palpable mass was noted in the left abdomen (Fig. 2).

On day three of life, abdominal ultrasonography (US) revealed a cystic mass measuring 4 × 3.6 cm, located between the spleen, the greater curvature of the stomach and the duodenum. A small communication between the cyst and the gastric lumen was suspected. Cross-sectional imaging was performed to assist surgical planning, because the exact relationship of the cyst with the stomach and adjacent organs, as well as the possible communication with the gastric lumen, remained uncertain on ultrasound. Magnetic resonance imaging (MRI) was not accessible for this neonate at the time of diagnosis. Therefore, a paediatric low-dose abdominal computed tomography (CT) scan focused on the upper abdomen was performed.

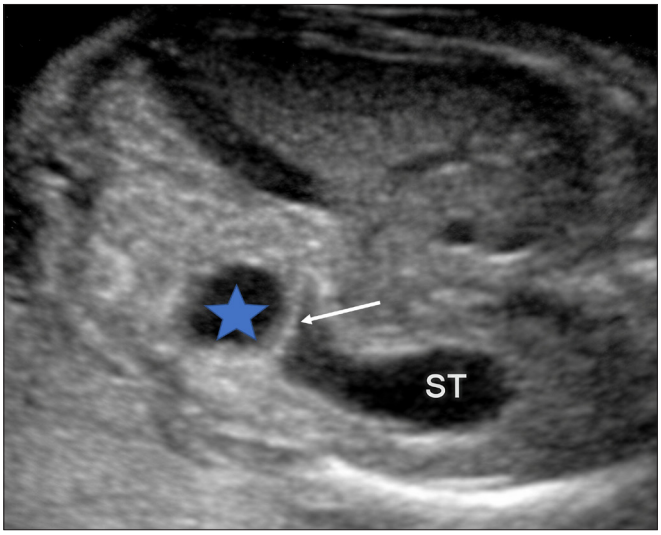


Fig. 1. Antenatal ultrasonography showing a cystic lesion (blue star) indenting on the distal body of the stomach (ST). Note the characteristic double-layered wall (white arrow), suggestive of a GDC.



Fig. 2. Clinical photograph of the abdomen showing left-sided abdominal distension due to a palpable mass.

CT showed a fluid-filled mass compressing the posterior side of the stomach. This mass did not enhance after contrast administration, suggesting a non-communicating GDC (Fig. 3). The infant remained asymptomatic and was discharged on day 11 of life.

At outpatient follow-up, repeat ultrasound confirmed the presence of a cystic lesion with a muscular wall and a similar size to that seen on the initial ultrasound. Elective laparoscopy at 2 months of age revealed a GDC between the greater curvature of the stomach and the spleen (Fig. 4). There was no communication between the cyst and the stomach. Complete macroscopic excision of the cyst was performed without opening the gastric lumen. Histopathological examination confirmed a cystic lesion lined by attenuated columnar epithelium with partial erosion and underlying muscular layers, consistent with a GDC. The patient's postoperative course was uncomplicated.

At 4-year follow-up, the child showed normal growth and development without recurrence of a GDC.

Discussion

GDCs constitute 2 - 7% of all GIDs, which have an incidence of 1 in 4 500 live births.[1,2] Gastric duplications are usually located adjacent to the greater curvature of the stomach and pylorus, and rarely at the fundus.[3] They are more commonly cystic than tubular and do not typically communicate with the lumen.[4]

Prenatal diagnosis facilitates early recognition of gastric duplications, which should be resected. Gastric duplications may lead to a wide spectrum of complications, the most common being obstruction of the gastric outlet or adjacent bowel, infection, upper gastrointestinal bleeding and perforation. Ultrasonography typically demonstrates the 'double-wall' sign of gastric duplications, an inner hyperechoic layer correlating with the mucosa-submucosa and an outer hypoechoic layer representing the muscularis propria, a finding that is highly indicative of enteric duplications.[3,5,6]

In the paediatric population, differential diagnoses for a cystic lesion in the upper abdomen include mesenteric or omental cysts, pancreatic cysts, choledochal cysts, adrenal cysts, and Meckel's diverticulum.[3,7] Although ultrasound is usually sufficient to suggest the diagnosis of GID cysts, MRI more clearly delineates the anatomical boundaries of the cyst.[3] MRI provides excellent anatomical detail without ionising radiation and should be preferred to CT, as radiation exposure in neonates should be minimised. CT should be reserved for situations in which MRI is unavailable, contraindicated, or urgently required. In our case, MRI was not accessible at the time of diagnosis, whereas a single paediatric low-dose abdominal CT focused on the upper abdomen could be obtained rapidly.

Recent paediatric case reports showed that imaging findings may vary widely depending on the location and size of the duplication cyst, as well as the presence of associated anomalies. These reports confirm that most duplication cysts present in the neonatal period or early childhood, yet their imaging appearance can be misleading and often warrants a multimodal approach using high-resolution ultrasound supplemented by CT or MRI when necessary.[3, 6, 8-10] In our case, the antenatal ultrasound suggested the GDC. However, postnatal ultrasound raised concerns regarding possible communication between the cyst and the gastric lumen; this uncertainty was resolved by CT imaging.

Treatment consists of complete excision. An alternative is marsupialisation of the cyst wall and stripping of the mucosal lining if it is not possible to find a plane of separation between the cyst and the stomach.[11]

Long-term outcomes are generally favourable, particularly when complete excision is achieved without injury to adjacent structures. Nevertheless, careful follow-up is recommended to monitor for potential sequelae, including gastric emptying disorders and complications related to residual heterotopic mucosa, such as ulceration. Although rare, malignant transformation in untreated duplications has been reported,[11] underscoring the importance of early diagnosis and definitive surgical management.

Conclusion

Antenatal detection of suspected GDCs enables early planning and optimisation of postnatal management. In the neonatal period, imaging findings may be variable or inconclusive, and a definitive

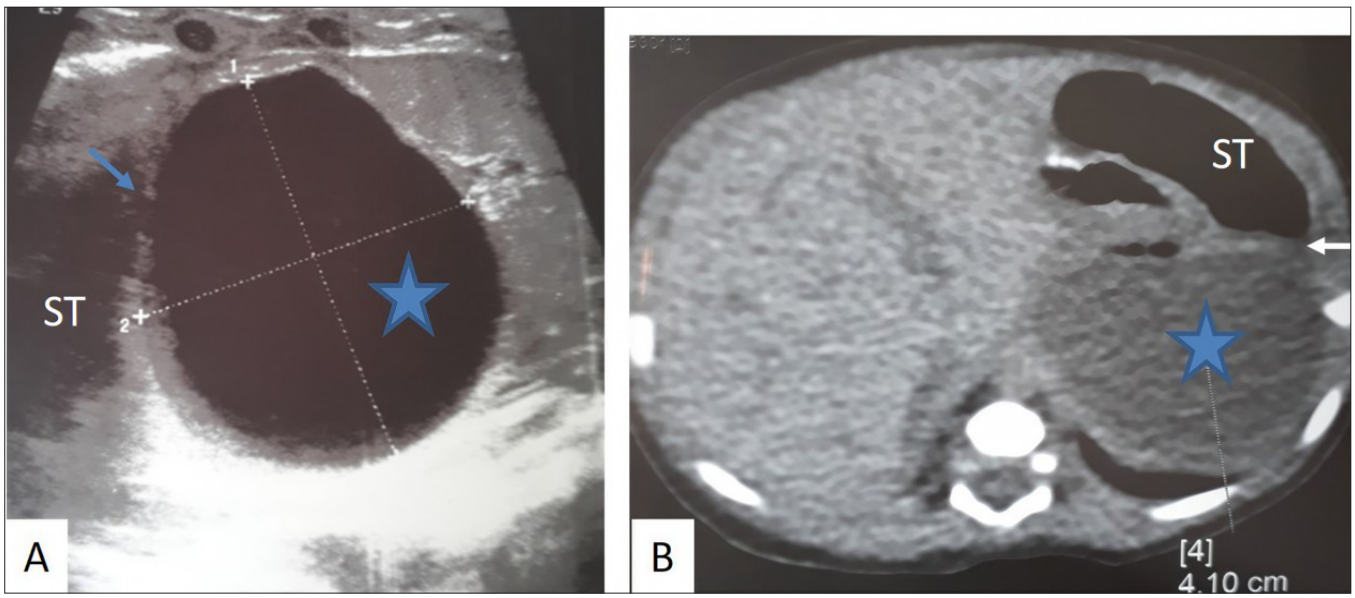


Fig. 3. *(A) Postnatal ultrasonography demonstrating a cystic mass measuring 4 × 3.6 cm (blue star) between the spleen and the greater curvature of the stomach and the duodenum. There was uncertainty regarding possible communication between the cyst and the gastric lumen (blue arrow). (B) Upper gastrointestinal contrast study showing a well-defined, fluid-density mass (blue star) displacing the posterior wall of the stomach. The wall of the cyst (white arrow) does not opacify with contrast and does not communicate with the gastric lumen, findings characteristic of a GDC.*

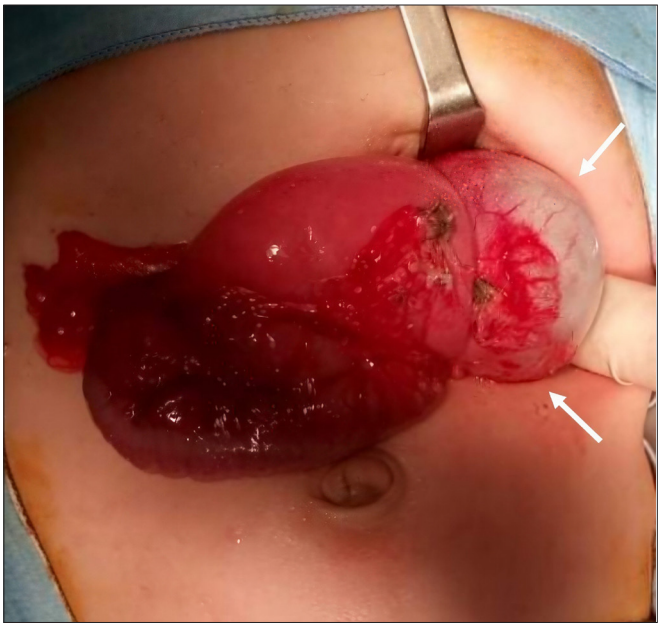


Fig. 4. *Intraoperative photograph showing the cyst (arrows) covered by the gastric serosa, without communication with the stomach.*

diagnosis ultimately requires histopathological confirmation following surgical excision. The diagnostic work-up should therefore be structured to prioritise radiation-sparing modalities. Ultrasonography should be used as the first-line imaging tool, supplemented by MRI when necessary, to obtain an accurate anatomical and functional assessment while minimising exposure to ionising radiation in this particularly vulnerable population.

Data availability. No new data were created or analysed in this study. Data sharing is not applicable to this article.

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