# Diagnosis of gastric duplication cysts in a child by endoscopic ultrasonography

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To the Editor: A 7-year-old girl was admitted to The First Hospital of Jilin University at 15:00 on August 28, 2016 due to vomiting lasting 3 days. Ultrasonography revealed a cystic echogenic mass (approximately 61.4 mm × 38.4 mm × 46.6 mm) located between the gastric antrum and the duodenum. The boundary of the mass was clear, and its wall structure was similar to that of the digestive tract. Abdominal computed tomography (CT) showed a cystic low-density mass in the hilar region; the boundary between the antrum and duodenum was unclear. Gastroscopy (Olympus Ltd., Tokyo, Japan) was performed under general anesthesia administered intravenously on August 31, 2016. The child was placed in the left lateral position, and the gastroscope was passed through the mouth and esophagus into the stomach. Gastroscopy revealed a  $4 \text{ cm} \times 3 \text{ cm}$  bulge in the posterior wall of the antrum that had a smooth surface and color similar to that of the surrounding mucosa. For endoscopic ultrasonography (EUS), we passed the ultrasonic probe (Olympus, frequency 20 MHz) into the stomach through the biopsy tube, injected water and placed the probe close to the lesion for ultrasonic scanning. On ultrasound, the 5-layer structure of the stomach wall was normal and a cystic structure  $(4 \text{ cm} \times 3 \text{ cm})$  was seen outside the wall with no echo. The interior consisted of a medium echo structure. The lesion was close to the stomach wall and bulged into the cavity. Thus, a diagnosis of gastric duplication cysts was considered.

After the initial diagnosis, the child was transferred to the department of surgery for further treatment on September 2, 2016. The patient underwent laparoscopic exploration under general anesthesia with endotracheal intubation on September 6, 2016. Intraoperatively, a cystic mass (approximately  $4 \, \mathrm{cm} \times 3 \, \mathrm{cm} \times 2 \, \mathrm{cm}$ ) was observed in the stomach wall. The mass heavily adhered to the gastric mucosa. After complete removal of the mass, pathological results showed smooth muscle tissue

in the mucosa, and ectopic pancreatic tissue in the wall, which was consistent with the diagnosis of gastric duplication cysts [Figure 1].

Gastrointestinal tract duplication is a rare congenital malformation. Gastric duplication cysts (GDC) reportedly account for about 2% to 9% of alimentary tract duplication. The estimated incidence of GDC in children is approximately 17 cases per million. [1] GDCs may cause abdominal pain, abdominal distension, nausea, vomiting, dysphagia, dyspepsia, and weight loss. The diagnosis of GDC is typically challenging, and most cases of GDC are detected during surgery. Some imaging techniques can facilitate the differential diagnosis. Abdominal ultrasound, CT, magnetic resonance imaging (MRI), and gastroscopy are often helpful in the diagnosis. However, the reported rate of misdiagnosis with CT scanning ranged from 43% to 70%;<sup>[2]</sup> further, MRI may not improve the accuracy of diagnosis.<sup>[3]</sup> Therefore, the most recommended imaging modality is EUS.[4] EUS is a technique that combines endoscopy and ultrasound to clearly show the level of the digestive tract wall and adjacent organs and tissues. The ability to distinguish between solid and cystic masses is a distinct advantage of EUS. Moreover, it can provide preliminary information about the nature and source of the lesion based on its origin and echo characteristics. Thus, EUS is considered the preferred choice for evaluating submucosal lesions. EUS has a wide range of indications, including an assessment of any suspicious lesions of the digestive tract itself and in adjacent organs that are not diagnosed by routine ultrasound.

EUS is used to diagnose GDC mostly in adults, but there have been a few reports in children. In the present case, GDC was successfully diagnosed in a child using EUS. EUS helped determine the depth and size of the lesion and avoid misdiagnosis. Therefore, this report suggests that EUS is a

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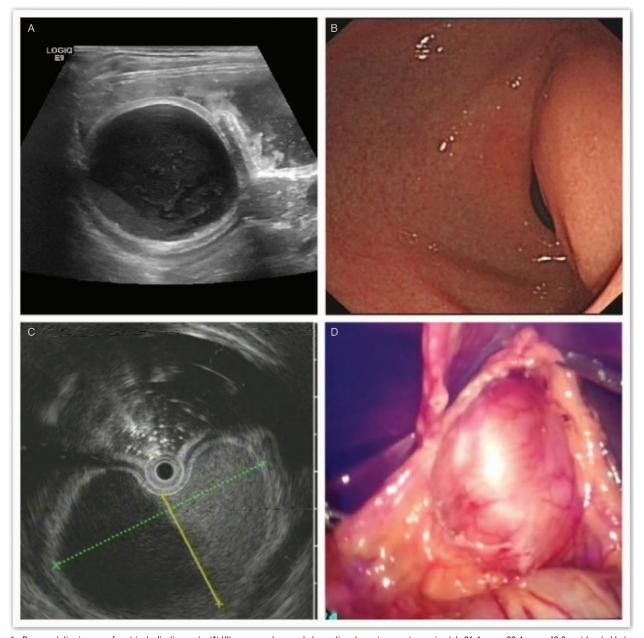


Figure 1: Representative images of gastric duplication cysts. (A) Ultrasonography revealed a cystic echogenic mass (approximately  $61.4\,\mathrm{mm} \times 38.4\,\mathrm{mm} \times 46.6\,\mathrm{mm}$ ) located between the gastric antrum and the duodenum. (B) Gastroscopy revealed a  $4\,\mathrm{cm} \times 3\,\mathrm{cm}$  bulge in the posterior wall of the antrum. (C) Endoscopic ultrasonography indicated a cystic structure  $(4\,\mathrm{cm} \times 3\,\mathrm{cm})$  outside the wall with no echo. (D) A cystic mass (approximately  $4\,\mathrm{cm} \times 3\,\mathrm{cm}$ ) was observed in the stomach wall. The mass heavily adhered to the gastric mucosa.

valuable imaging modality for preoperative diagnosis of GDC in pediatric patients.

# Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient's guardian has provided consent for publication of images and other clinical information in the journal. The patient's guardian understands that her name and initials will not be published and due efforts will be made to conceal her identity, but that her anonymity cannot be guaranteed.

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### **Conflicts of interest**

None.

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