DOI: 103126/JNPS.V4113

Case Report

Laparoscopic Excision of Gastric Duplication in a Child: A Case Report and Literature Review

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Article History
Received on - 2023 Jul 25
Accepted on - 2023 Oct 17

Keywords:
Congenital malformation; paediatric gastroenterology; paediatric surgery; minimally invasive surgery; laparoscopy; child

Online Access

DOI: https://doi.org/10.60086/jnps462

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Abstract
We present the case of a five-year-old child with a gastric duplication of antenatal discovery. The only clinical sign was an epigastric heaviness caused by the seat belt during car trips. The radiological assessment favored a cystic lesion on the stomach's posterior surface. Excision of the lesion is performed laparoscopically without incident. Histology results confirmed the diagnosis of digestive duplication. A two year-follow-up has been uneventful.

Introduction
Gastric duplication (GD) is a rare disease affecting 1 / 10,000 births, [1] of which 17 cases / 1000000 are localized in the stomach.[2] GD is due to congenital disturbance occurring early in fetal development.[2] The localization is most often the greater curvature of the stomach, but some lesions have been found in the antrum, the prepyloric region,[3] the cardia, or the posterior gastric wall.[4] The discovery occurs in the first year of life in 50% of patients and more than 70% of cases before age 12. There is a female predominance of the order of 8 to 1.[4] The imaging assessment makes it possible to identify the lesion and its location. Clinical symptoms are related to the location of the lesion and the presence of gastric heterotopia[1] and include non-specific signs such as abdominal pain, vomiting, rectal bleeding, and feeding difficulties. Complications may be in the foreground, such as intestinal bleeding, perforation, or digestive obstruction.[2] Treatment is surgical. The final diagnosis is histological.

Case report

A five-year-old girl consulted at paediatric surgery department for several episodes of epigastric heaviness, which were happening during long car journeys. She underwent many ultrasound since the age of two, and was lost to follow-up. The persistent and disabling digestive symptoms prompted her parents to consult again. The parents reported that a digestive duplication was antenatally diagnosed on the third trimester's ultrasound. A cystic image, in contact with the stomach, was highlighted and confirmed on a postnatally performed ultrasound. On clinical examination, the abdomen was flexible and painless; the palpation demonstrated no abdominal mass. The blood tests were normal. An abdominal ultrasound showed a cystic-like lesion in front of the posterior-internal wall of the stomach. (Figure 1a)

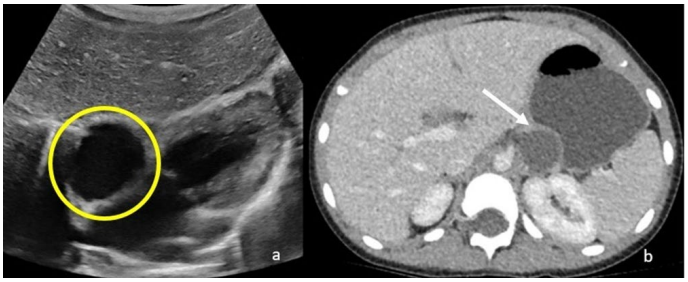

Figure 1: Imaging: a) on the abdominal Ultrasound, the lesion appeared as a cyst, with a hyperechoic wall, and a hypoechoic fluid content (yellow circle). b) The abdominopelvic CT scan showed that the cyst wall was tightly attached to the medial gastric wall (white arrow).

No stenosis or extrinsic compression were detected on an Upper Gastrointestinal series. An injected abdominopelvic CT scan found a cystic formation adjacent to the medial surface of the stomach, along the smaller curvature of the stomach, measuring 27 x 21 x 25 mm, and well limited (Figure 1b), and confirmed on Magnetic Resonance Imaging (MRI). (Figure 2)

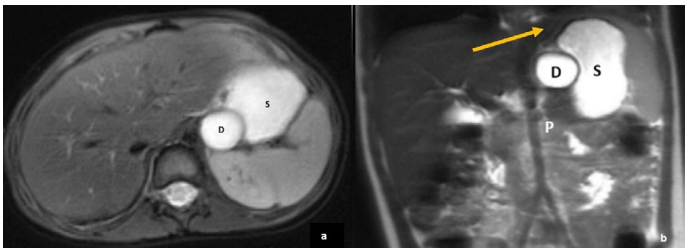

Figure 2. Abdominal T2 Magnetic Resonance Imaging: a) on the axial view, the wall shared between the duplication (D) and the stomach (S) was hypointense. b) The duplication (D) was located under the oesogastric junction (orange arrow), and above the pancreatic body (P).

Differential diagnoses include gastric or pancreatic pseudocysts, stromal gastric tumors and gastric adenomas. Imaging does not confirm the diagnosis, so histological analysis of the lesion is necessary. The cyst was removed laparoscopically. (Figure 3)

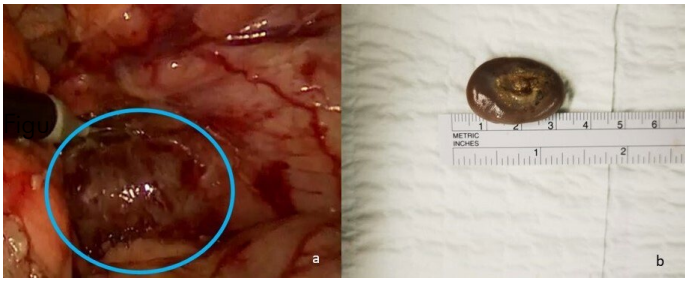

Figure 3: Peroperative findings: a) the duplication (blue circle) was tightly attached to the stomach. b) Aspect of the duplication after surgery.

The procedure lasted 289 minutes, including 141 minutes of operating time. The postoperative outcomes were unremarkable. The patient was discharged home on postoperative day 2. Histological analysis confirmed the diagnosis of gastric duplication. Follow-up with radiological monitoring at one month, three months, six months, one year, and two years was uneventful.

Discussion

GD is a rare congenital condition during fetal development,[2] and can lead to digestive discomfort or complications.[1] The predominance is essentially female.[4] The disease is discovered in the first year of life, or even antenatally, and mainly before age 12. Adult diagnoses have been described.[5] The incidence is 17 cases / 1000000.[2] No cases reported in childhood were malignant or escalated into malignant lesions.[3] On the other hand, the discovery of GD in adulthood exposes the risk of gastric neoplasia, even if the lesion is the subject of complete excision, particularly if it is chipped intraoperatively with its continuous pouring into the abdominal cavity.[5]

GD may be associated with other pathologies, such as intestinal atresia or spinal cord defects.[2] Common anatomical forms are elliptical, spherical, cystic, and gastric muscular-related.[4] Digestive symptoms are insignificantly associated with abdominal pain, vomiting, and bloody stools.[2] Complications exist, such as infection, bleeding, and perforation; [4] GD can also mimic a pathology such as gastric adenomyoma.[6]

Imaging (ultrasound, CT, and MRI) helps with the diagnosis.[2] Features are a thick-walled cystic lesion with fluid content.[4] We performed the upper gastrointestinal series because of the epigastric heaviness described by the patient, raising fears of a mass effect. Zhang et al performed a Technetium 99 scintigraphy in search of gastric heterotopia,[2] but we chose not to, knowing that the patient would undergo surgery, anyway. Even if different differential diagnoses exist for cystic lesions in contact with the stomach, only histological analysis can confirm the diagnosis and highlights a lesion with a clean wall and in continuity with the stomach.[4]

The treatment is surgical and should be carried out since the diagnosis is suspected, or at least in early childhood. The laparoscopic procedure is the gold standard; however, conversion to laparotomy, or primary laparotomy can be chosen if exposure or dissection are challenging. The objective is to remove the lesion without puncturing it, which may contaminate the peritoneum. In this case, the risk of neoplasia exists.[3] Liu et al reported the case of a patient whose content of the GD spilled into the abdominal cavity and who later developed adenocarcinoma, even though histological analysis showed a genetically benign GD.[7] The risk of recurrence of GD

is correlated with incomplete excision. In one case, a paediatric GD has escalated to a neoplastic lesion in adulthood. [7]

Conclusions

Gastric duplications are rare in the paediatric population. Clinical symptoms are eclectic. Imaging is a good device to find the diagnosis, but only histology can give a complete confirmation. The laparoscopic approach is safe and reproducible in children. However, the excision must be radical because the risk of neoplasia exists with incomplete excision, or with late surgery in adulthood.

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