International Journal of Pediatric Surgery

ISSN: 2766-5577

Research Article

Gastric Duplication: A Latin-American Multicentric Study

Mario Riquelme[1], Joel Cazares[2], Secundino López[3], Jorge Tapia[4] and Jorge Cantú[2]*

[1]*Department of General Surgery and Pediatric Surgery, Christus Muguerza Hospital, México*

[2]*Maternal and Child Hospital, México*

[3]*Morelia Children Hospital, México*

[4]*Morelense Children Hospital, México*

Abstract

Introduction: Dr. William Ladd coined the term gastrointestinal tract duplication in 1937. It is a relatively rare congenital abnormality with an incidence of 1 in 4500 to 5000 births found anatomically from mouth to anus.

Gastric duplication is a rare clinical entity; it represents 9% of all gastrointestinal tract duplications; it occurs in approximately 17 cases out of every 1,000,000 live births.

Methods: Multicenter casuistry of 5 Hospitals in Mexico in which five patients with a diagnosis of gastric duplication collected in the last seven years were collected.

Results: The approach was open in three patients, one laparoscopic and the other video-assisted. The symptoms were varied, the most frequent being abdominal distention, vomiting, abdominal pain, and palpation of an abdominal mass. All were cystic duplications, and the largest diameter varied from 5 cm to 15 cm with an average of 9 cm.

Conclusion: Gastrointestinal duplications are rare malformations that cause various symptoms. Gastric duplications are the least frequent of all intestinal tract duplications. In no case was the diagnosis of gastric duplication suspected with an abdominal ultrasound in the preliminary study. The most frequent preoperative diagnosis by the surgeon and radiologist was mesentery cyst and common bile duct cyst, and cystic teratoma.

Keywords: Gastric duplication; Ultrasound; X-ray; CT scan

Introduction

Dr. William Ladd coined the term gastrointestinal tract duplication in 1937 [1]. It is a relatively rare congenital abnormality with an incidence of 1 in 4500 to 5000 births [2], found anatomically from mouth to anus. They are also known as an enteric cyst, entheogenic cyst, reduplication cysts [3]. They can be single of variable size, and their shape can be tubular or cystic; the latter do not have communication with the intestinal lumen. They are generally located in the mesenteric part of the intestine. They share the muscular wall and the blood supply of the part of the intestine to which they are attached, and their mucosa is also intestinal in appearance.

"The associated findings of vertebral, spinal cord, and Genitourinary (GU) malformations, as well as malrotation and intestinal atresia, suggest a multifactorial process in their development" [4-6]. "There are five prevailing theories: partial twinning, split notochord, diverticular defects, canalization defects, and environmental factors. The partial twinning theory states that organs can be doubled as a result of partial twinning. This theory may be pertinent in hindgut duplications associated with GU tract duplications" [7,8].

"The split notochord theory centers on notochord separation in the first month of gestation. This theory postulates that gaps in the notochord develop and allow the gut endoderm to herniate and form diverticula. This theory could account for the association of duplications with spinal defects" [9-11]. Finally, environmental factors including hypoxia, vascular accidents, and trauma have been implicated in developing these anomalies [12,13].

Gastric duplication is a rare clinical entity; it represents 9% of all gastrointestinal tract duplications. It occurs in approximately 17 cases out of every 1,000,000 live births. From 1952 to 2017, 98 cases have been reported [14]. Most are cystic and originate from the greater curvature, antropyloric region, and do not communicate with the stomach lumen [15,16]. The symptoms are varied, but the most frequent presentation is abdominal pain, vomiting, and palpable mass [14]. In some patients, the symptoms may be derived from some complications: intestinal obstruction, bleeding, or perforation [17-19].

Materials and Methods

A multicenter casuistry of 5 Hospitals in Mexico is presented in which five patients with a diagnosis of gastric duplication collected in the last seven years were collected, the rest of the gastrointestinal

Citation: Riquelme M, Cazares J, López S, Tapia J, Cantú J. Gastric Duplication: A Latin-American Multicentric Study. Int J Pediatr Surg. 2022;3(1):1021.

Publisher Name: Medtext Publications LLC

Manuscript compiled: Jan 27th, 2022

***Corresponding author:** Mario Riquelme, Department of General Surgery and Pediatric Surgery, Christus Muguerza Hospital, Monterrey NL, 64060, Mexico, E-mail: cima_riquelme@hotmail.com

duplications were discarded. The approach was open in three patients, one laparoscopic and the other video-assisted. In the two patients with a minimally invasive approach (Figures 1-3), three 3 mm trocars and a 5 mm 30 and 45-degree lens were used.

Four of them were male and one female. The age varied from 10 years to 3 months, four of them under 1 year. The symptoms were varied, the most frequent being abdominal distention, vomiting, abdominal pain, and palpation of an abdominal mass. In four of them, the first study was an abdominal ultrasound. In three of them, it was accompanied by an abdominal CT scan since the ultrasound was insufficient to make a diagnosis. SEGD was requested as the first diagnostic study in only one case since a double bubble image was appreciated in the plain abdominal X-ray. In no case was the possibility of gastric duplication suspected in the primary preoperative studies. The preoperative diagnoses were: Choledochal Cyst, Cystic Teratoma, Duodenal Membrane, Retro Gastric Cystic Mass, and Mesentery Cyst, none communicated with the stomach lumen. All were cystic duplications, and the largest diameter varied from 5 cm to 15 cm with an average of 9 cm. No patient presented another associated malformation (Table 1).

Results

Three of the patients were approached openly, one with a video-assisted approach and the last by laparoscopy. The average surgical time was 1 hour 20 minutes. In two patients, the duplication was originated in the greater curvature of the stomach. One patient in the posterior gastric fundus near the gastroesophageal junction. And another patient in the anterior wall of the stomach. None of the duplications communicated with the lumen of the stomach, but they shared a thin wall, so in two cases, the stomach was opened during the procedure, so it was necessary to suture it in two layers. The diet was started on average 48 hours after the intervention. No patient presented complications. The long-term follow-up did not show any complications either (Table 1).

Conclusions

Gastrointestinal duplications are rare malformations that cause a variety of symptoms. Gastric duplications are the least frequent of all intestinal tract duplications, approximately 2% to 9%. Because of their frequency, there are few large series, so it is necessary to carry out multicenter studies. In this series, no particular symptoms predominated since two patients presented as a palpable mass and two with vomiting.

The most exciting thing about this series is that in no case was the diagnosis of gastric duplication suspected with the preliminary study, which was an abdominal ultrasound. The most frequent preoperative diagnosis by the surgeon and radiologist was mesentery cyst and common bile duct cyst, and cystic teratoma. It was even in the operating room where the diagnosis was made with certainty. The lesson to be learned is that in every abdominal ultrasound where a cystic mass appears, we must consider a gastric duplication cyst as the first possibility.

Given the anatomical characteristics and the simplicity of its resection, no intraoperative or postoperative complications have been reported. The primary approach should be considered minimally invasive, especially in small lesions that are easily resectable, and if this is not possible and once the diagnosis is made, MIS surgery helps us reduce the incision.

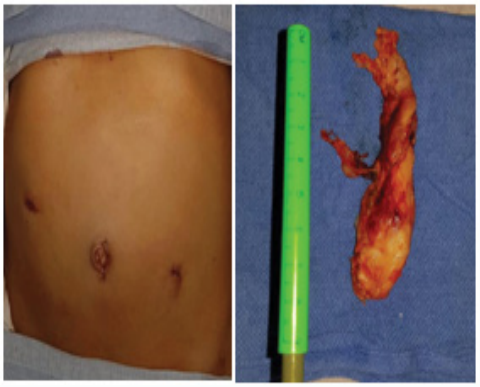

Figure 2: Site of incisions in the abdomen and surgical piece.

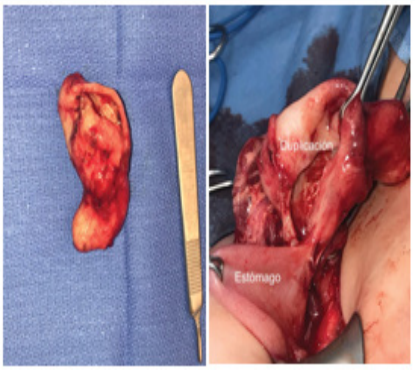

Figure 3: Video-assisted approach and surgical piece.

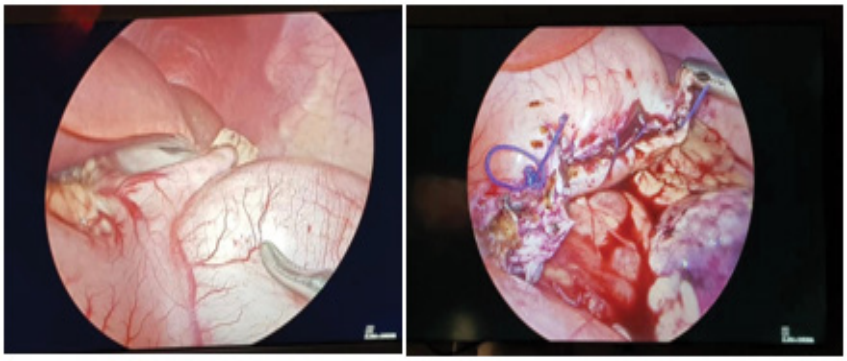

Figure 1: Laparoscopic approach.

Table 1: The long-term follow-up in patient's complications.

Patient	1	2	3	4	5
Sex	Male	Male	Female	Male	Male
Age	11 months	10 years	8 months	3 months	6 months
Symptoms	Palpable mass	Abdominal pain and bloating	Vomiting Abdominal distention	Asymptomatic Father palpate the tumor	Vomiting
Physical findings	Palpable mass in upper left quadrant.	Righthypochondriummass 15x15	Abdominal distension	Palpable mass	Normal
Diagnostic method	US abdomen, CT scan	Ultrasound	CT scan, ultrasound	CT, Ultrasound	Esophageal-gastro-duodenal serie double bubble image
Preoperative diagnosis	Mesenteric cyst	Choledochal cyst	Retro-gastric cystic mass	Mesenteric cyst	Duodenal membrane
Intraoperative measures	Cyst 10 × 6 cm	Cyst 15 × 15 cm	Cyst 5 × 6 cm	Cyst 9 × 5 cm	Cyst 6 × 8 cm
Location	Greater curvature	Anterior wall of the stomach	Posterior wall in fundus near gastroesophageal junction	Greater curvature	Greater curvature
Surgical time	120 min	80 min	60 minutes	95 min	1 hour
Communication	No	No	No	No	No
Approach	Laparoscopic	Open	Open	Video-assisted	Open
Pathology	Gastric duplication	Wall with stomach characteristic	Stomach characteristic	Stomach characteristic	Stomach character
Associated malformations	No	No	No	No	No

References

1. Ladd WE. Duplications of the alimentary tract. South Med J. 1937;30(5):363-71.
2. Schalamon J, Schleef J, Hollworth ME. Experience with gastrointestinal duplications in childhood. Langenbeck's Arch Surg. 2000;385(6):402-5.
3. Puri P, Hollwarth ME. Gastrointestinal duplications. In Puri P, editors. Pediatric Surgery. 2nd ed. Germany: Springer-Verlag Berlin and Heidelberg GmbH & Co.; 2020.
4. Gross RE, Holcomb GW, Farber S. Duplications of the alimentary tract. Pediatrics. 1952;9(4):449-67.
5. Stringer MD, Spitz L, Abel R, Kiely E, Drake DP, Agrawal M, et al. Management of alimentary tract duplication in children. Br J Surg. 1995;82(1):74-8.
6. Holcomb GW, Gheissari A, O' Neill JA, Shorter NA, Bishop HC. Surgical management of alimentary tract duplications. Ann Surg. 1989;209(2):167-74.
7. Smith ED. Duplication of the anus and genitourinary tract. Surgery. 1969;66(5):909-21.
8. Lewis PL, Holder T, Feldman M. Duplication of the stomach: report of a case and review of the English literature. Arch Surg. 1961;82:634-40.
9. Bentley JFR, Smith JR. Developmental posterior enteric remnants and spinal malformations: the split notochord syndrome. Arch Dis Child. 1960;35(179):76-86.
10. Qi BQ, Beasley SW, Williams AK. Evidence of a common pathogen- esis for foregut duplications and esophageal atresia with tracheo- esophageal fistula. Anat Rec. 2001;264(1):93-100.
11. Qi BQ, Beasley SW, Frizelle FA. Evidence that the notochord may be pivotal in the development of sacral and anorectal malformations. J Pediatr Surg. 2003;38(9):1310-6.
12. Mellish RW, Koop CE. Clinical manifestations of duplication of the bowel. Pediatrics. 1961;27:397-407.
13. Favara BE, Franciosi RA, Akers DR. Enteric duplications: thirty-seven cases: a vascular theory of pathogenesis. Am J Dis Child. 1971;122(6):501-6.
14. Holcomb GW, Murphy JP, Peter SD. Alimentary Tract Duplications. In: Holcomb GW, editors. Holcomb and Ashcraft Pediatric Surgery. 7th ed. Philadelphia: Elsevier; 2019. p. 629-40.
15. Jaroslavsky D, Dinerstein A, Balanian N, Bou-khair AV, Cuervo JL, Iglesias J. Duplicaciones del tubo digesttivo. A propósito de un caso clínico. Rev Hosp Mat Inf Ramón Sardá. 1997;2:63-6.
16. Mejaddam AY, Russell KW, Laje P. Clinical Manifestations and Management of Alimentary Tract Duplication Cysts in Children. APSA. 2018.
17. Shew SB, Holcomb GW. Alimentary tract duplications. In: Ashcraft KW, Holcomb GW, Murphy JP, editors. Pediatric surgery. Philadelphia, PA: Elsevier; 2005. p. 543-52.
18. Bonacci JL, Schlatter MG. Gastric duplication cyst: A unique presentation. J Pediatr Surg. 2008;43(6):1203-5.
19. Kuraoka K, Nakayama H, Kagawa T, Ichikawa T, Yasui W. Adenocarcinoma arising from a gastric duplication cyst with invasion to the stomach: a case report with literature review. J Clin Pathol. 2004;57(4):428-31.