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Spectrum of Pediatric Gastrointestinal Duplications: A Single Centre Observation

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***Abstract**: During the period of February 2015 to January 2017 total 11 cases of gastrointestinal duplication presented in various ways in the department of pediatric surgery in a tertiary care hospital, Kolkata. Which include Gastric, Duodenal, Jejunal, Ileal, Sigmoid& Rectal Duplication Cysts. Preoperativly diagnosed by various types of imaging modalities & treated accordingly. In most of our cases diagnosis were confirmed only during or after operation.*

***Key words:** Pediatric, gastrointestinal tract, duplications.*

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I. Introduction

The term intestinal duplication was first used by Fitz in 1844 in a paper suggesting that alimentary tract duplications arose from persistent omphalomesenteric remnants.[1] But was not widely adopted until it was popularized by Ladd in the 1930s, [2] with further classifications by Gross in the 1950s. Calder is said to have first reported lesions similar to them in 1733. [3] Ladd was the first to use the term duplication of alimentary tract, applying it to congenital lesions having the following three characteristics:

- Epithelial lining of GI mucosa
- Presence of well-developed smooth muscle in the wall
- Association with the GI tract

Gastro intestinal Duplications are rare congenital pediatric anomalies presented in various ages. Embryologically upper gastrointestinal duplications are due to split notochord syndrome where as lower gastrointestinal duplications are due to abortive twining.Presenting symptoms may vary from gastrointestinal obstruction, lump abdomen, hematemesis & chronic constipation.
We are presenting 11 cases of gastrointestinal duplications.

II. Materials And Methods

During the period of February 2017 to January 2019 total 11 cases of gastrointestinal duplications were managed in the department of pediatric surgery, out which one case was of Gastric duplication, three cases were of duodenal duplications, one was jejunal, two were ileal, one sigmoid & three were rectal duplications [Table 1].

Gastric duplication-7 years 2m male child presented with non-bilious vomiting for two years, Upper gastrointestinal contrast study was inconclusive ,CT Scan suggested Duodenal or Gastric duplication ; Per operative diagnosis was gastric duplication at the region of pylorus confirmed by H/P/E report. [Figure-1]

Duodenal duplication – First case - 10 days male neonate presented with umbilical cord hernia, per operatively found duodenal duplication cyst, second case -22 days male child admitted with recurrent bilious vomiting,X-ray-No signs of obstruction USG & contrast study showed normal passage of dye through G.I.T, but on exploration duodenal duplication was found, confirmed by H/P/E report; third case - 3 years old male presented with recurrent vomiting(bilious & non-bilious both), occasional hematemesis;USG ,Contrast study could not be able to make any diagnosis.CECT whole abdomen was suggestive of duodenal duplication, Per operative & post operative H/P/E diagnosed as duodenal duplication with gastric mucosa.

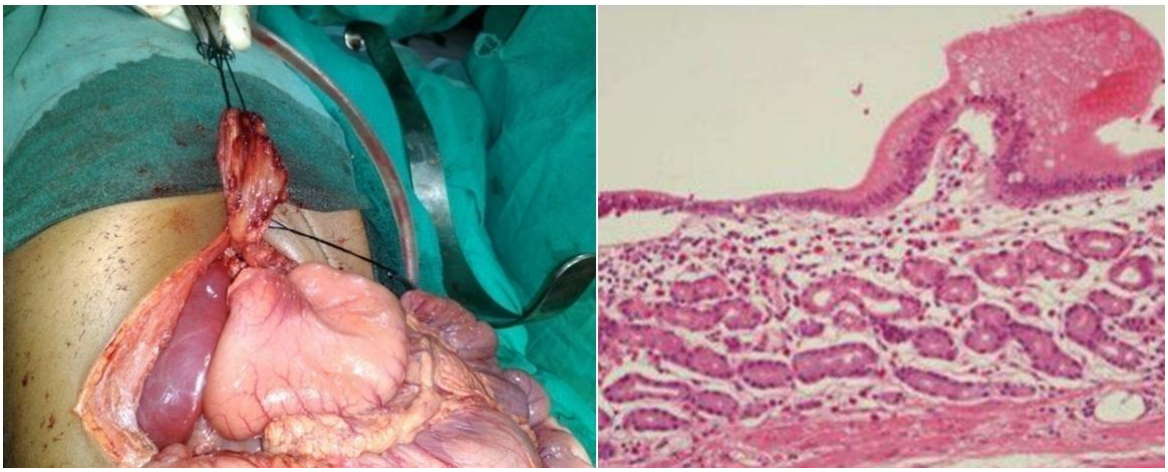

Figure 1: Intra-operative picture showing gastric duplication cyst with HPE picture

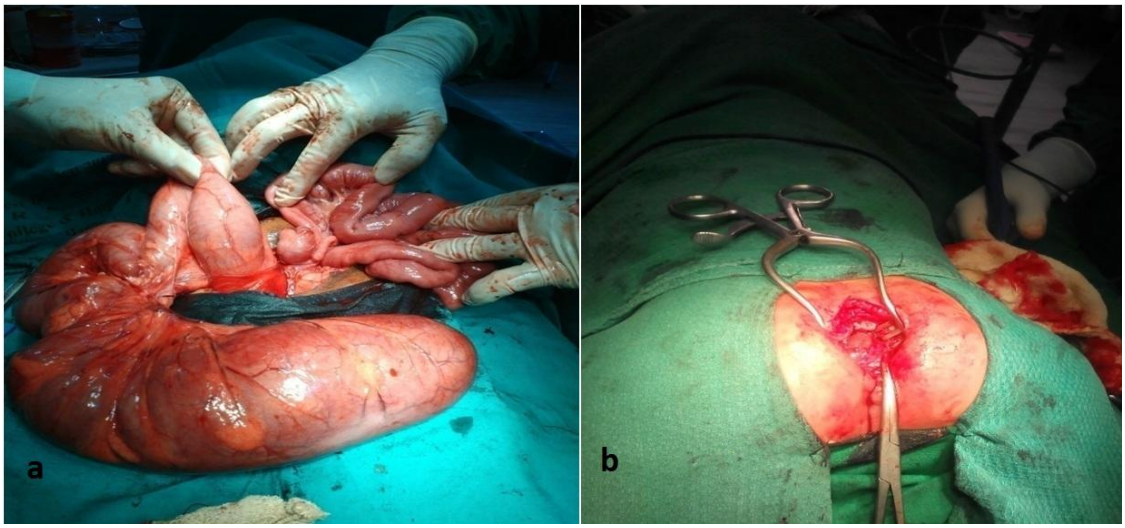

Figure 2: Intra-operative picture showing (a) sigmoid colon duplication cyst and (b) rectal duplication cyst

III. Results

Jejunal & Ileal duplication cyst- one 4 month old female & one 5 month old male presented with acute intestinal obstruction, USG diagnosed Intussusceptions, per operative & Post operative H/P/E confirmed diagnosis of one jejuna & ileal duplications respectively. Second ileal duplication was incidental finding of a case of 9 month female child with common cloacae, diagnosed during abdominal pull through , was tubular duplication about 4cm length with luminal connection .

Sigmoid duplication- 6 years old male child of ARM admitted for colostomy closure. On exploration for colostomy closure, tubular duplication of sigmoid colon was found without luminal connection. H/P/E report after excision was found hind gut duplication. [Figure 2a]

Rectal duplication-Case no.-1: 29 days old male child presented with acute intestinal obstruction. On exploration pre sacral cyst causing pressure obstruction. Excision of cyst & proximal colostomy was done, H/P/E report came out as rectal duplication, Case no.-2 Diagnosed incidentally in a case of ARM with vestibular fistula during primary PSARP at 2 months of age & case no -3 : 1 year 10 months old male presented with constipation & irregular bowel habits. Routine investigations, USG, Thyroid profile were WNL.CECT showed a presacral cystic structure suggestive of rectal duplication; per operative & postoperative H/P/E confirmed diagnosis of rectal duplication [Figure 2b].All the cases of rectal duplications were cystic in nature without luminal connection.

Serial no.	Types of duplications	Case no.	Pre operative diagnosis	Per operative diagnosis	Post operative diagnosis by H/P/E report
1	Gastric	One	By CECT gastric duplication	Gastic duplication	Gastric duplication
2	Duodenal	One	Umbilical cord hernia	Duodenal duplication	Duodenal duplication
3	Duodenal	Two	SAIO	Duodenal duplication	Duodenal duplication
4	Duodenal	Three	By CECT duodenal duplication cyst	Duodenal duplication cyst	Duodenal duplication wit gastric mucosa
5	Jejunal	One	By USG Intussusception	Jejunal duplication cyst	Jejunal duplication cyst
6	Ileal	One	By USG Intussusception	Ileal duplication cyst	Ileal duplication cyst
7	Ileal	Two	Incidental finding of a case of common clocae	Ileal duplication cyst	Ileal duplication cyst
8	Sigmoid	One	Incidental finding of ARM patient during colostomy closure	Sigmoid duplication	Sigmoid duplication
9	Rectal	One	Acute intestinal obstruction	Rectal duplication	Rectal duplication
10	Rectal	Two	Incidental of a ARM patient during PSARP	Rectal duplication	Rectal duplication
11	Rectal	Three	By CECT Rectal duplication	Rectal duplication	Rectal duplication

Table 1: Table showing various types of pediatric duplications with details [n=11]

IV. Discussion

Approximately two thirds of all intestinal duplications are discovered within the first 2 years of life, with one third identified in the newborn period .In our study 8 out of 11 cases were below 2years & 3 out of 11 were presented during neonatal period. Although the exact incidence is unknown, Potter in 1961 reported two cases in more than 9000 fetal and neonatal autopsies.[4] They may be slightly more common in males. In our study 8 males & 3 females were found. About 80% of intestinal duplications are found in the abdomen.[5] Because multiple duplications may be present in as many as 20% of patients, other duplications should be sought if single duplication is diagnosed. Rectal duplication if intimately fused would require an extensive resection of rectum which might compromise continence. So alternatively in these complex cases a variety of other approaches may be required like mucosal stripping or fenestrating the two lumens by linear stapler or hand sewn side to side anastomosis. [6,7]in all the three cases of rectal duplications we excised the posterior wall with mucosal stripping of common wall .In two of them rectal wall was opened, so we repaired & proximal diversion colostomy was made. Gastrointestinal tract duplications are rare and mostly occur in ileum, with only 5% of all duplications occurring in rectum,[8]although we had slightly higher incidence of rectal duplications (3 out of 11 duplications).There had been about 17 case reports of hindgut duplication associated with anorectalmal formations (ARM) of which 8 were rectal duplications. A duplication cyst of the pylorus is an extremely rare congenital anomaly of the gastrointestinal tract.

V. Conclusion

Gastrointestinal duplications are very rare congenital anomaly, but not uncommon. Incidence is mostly common in males than females (2.66:1). Seven patients were Symptomatic and four cases were asymptomatic. Diagnoses were mostly confirmed during operation or after H/P/E report though CECT helped in diagnosis in some cases.

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