



ISSN NO. 2320-5407

Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL
OF ADVANCED RESEARCH

RESEARCH ARTICLE

A CLINICAL STUDY OF GASTRO INTESTINAL DUPLICATIONS IN CHILDREN

Dr.P.Venkateshwar and Dr.J.Janardhan

Associate Professor of surgery, Osmania Medical College, Hyderabad, Telangana

Manuscript Info**Manuscript History:**

Received: 18 August 2015

Final Accepted: 22 September 2015

Published Online: October 2015

Key words:

Gastro intestinal Duplication cyst,
Hetro tropic mucosa, Meckel's
diverticulum

Corresponding Author*Dr.P.Venkateshwar****Abstract**

Duplications of the alimentary tract are rare malformations which vary in appearance, size, location and symptoms. They are reported from tongue to anus in Para mesenteric location which differentiates them from diverticulum. Duplications are either cystic or tubular in shape communicating or noncommunicating and epithelial lining often mimics adjacent intestine. Some duplication cysts are silent and persist into adulthood. Presentation depends on location and size and presence of heterotopic gastric mucosa causing voloulus or intussusception, constipation or painless gastro intestinal bleeding. Neoplastic changes have been reported in duplications. Ultrasonography, computed tomography and contrast studies can be useful in diagnosis. This is prospective study to evaluate and review Gastro intestinal duplication over 3 years regarding various clinical presentations preoperative diagnosis and treatment modalities

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Duplications of the alimentary tract make up a group of rare malformations that vary greatly in appearance, size, location and symptoms. Ladd introduced the term: "Duplication of the alimentary tract" to encompass a group of congenital anomalies that have 3 characteristics James et al (2005).¹ The presence of well developed smooth muscle
2. The epithelial lining represents some portion of the alimentary tract; and 3. Most duplications are intimately attached to some portion of the Gastro intestinal tract (GIT). Duplications are seen in 1 in 4500 autopsies, most major institutions can anticipate 2 to 4 cases per year James et al (2005). Small intestine is the most common site, whereas rectal, duodenal, gastric and thoracoabdominal locations are extremely rare. Synchronous duplications can occur in up to 15% of patients. An association has been noted between vertebral anomalies, such as bifid or fused spines and thoracic and thoracoabdominal duplications. Enteric cystic duplications have been documented with co-existing intestinal atresia and malrotations. Tubular hind gut duplications are frequently associated with genito-urinary and genital malformations. Presentation depends on location and size of the duplication and other factors such as presence of heterotopic gastric mucosa. Pyloric or duodenal duplications have been noted to mimic hypertrophic pyloric stenosis. Intestinal duplication can serve as the focal point for volvulus or intussusception. Peptic ulcerations can occur in duplications similar to that seen with Meckel's diverticulum causing painless gastrointestinal hemorrhage, and ulceration can produce a full thickness perforation with free intra abdominal air. Colonic or presacral duplications present with constipation or prolapse or as peri-rectal abscess. Some duplication cysts, however, remain silent and persist into adulthood. Neoplastic changes have been reported in duplications. Duplications are diagnosed by many methods. They have a characteristic enhancing rim on contrast computed tomography (CT). Contrast studies can be helpful in showing mass effect and displacement of the normal alignment. Technetium scanning can be used to detect heterotopic gastric lining in which bleeding predominates. Ultrasonography is successful in diagnosing duplications and has the added benefit of detecting genito-urinary anomalies in cases of colonic duplications. In many children with intestinal duplications the diagnosis is often made

on the operation table. The differential diagnosis of duplication cysts includes the following -Mesenteric cyst, ovarian cyst, Meckel's diverticulum, Pancreatic cyst, Choledochal cyst, and anterior meningocele.

Material and Methods

This study was done in Niloufer Hospital & Institute of Child Health, Attached to Osmania Medical College, Hyderabad. This study was done during the period from Aug 2006 to July 2009. All cases studied were subjected to detail history taking and thorough physical examination to arrive at a pre-operative diagnosis.

After admission routine investigations like CBP, urea, creatinine, electrolytes were carried out. Relevant investigations like chest x-ray, x-ray of the abdomen, ultrasound and CT scan was done in the above cases as and when required. In all the cases operative findings and postoperative diagnosis were recorded. Treatment was done according to the diagnosis. In the postoperative management, nasogastric aspiration, IV fluids, antibiotics and analgesics administered. Complication if any were noted and managed accordingly.

Results and Discussion

Seventeen cases were identified in our study during the period of three years from Aug 2006 to July 2009. There were 10 males and 7 females of which 4 were neonates, 3 infants, and 10 children. The clinical presentations of these patients depended on the age and site of duplication. 3 out of 4 neonates presented in emergency. There were 4 neonates, 3 infants, and 10 children. 76% of the patients were under the age of 5 years. The clinical presentations of these patients depended on the age and site of duplication. 10 out of 17 patients (60%) presented on emergency basis. Ultrasound scan of abdomen, along with x-ray abdomen were the most frequently used diagnostic modalities. Other investigations like, computed tomography scan, contrast studies were used occasionally. One neonate had prenatal diagnosis of abdominal cyst which was duplication cyst. The ileum was the frequent site of duplication followed by jejunum harboring 38.7% and 27.8% respectively. All patients in this series underwent resection with or without intestinal anastomosis of the gastrointestinal duplication. Cystic type of duplications was seen in almost all the patients except one case of Colonic duplication, which was tubular in nature. The pathological evaluation of the resected specimen showed Heterotrophic gastric mucosa was noted in 5 patients, and in 11 intestinal cases. All these patients were operated on emergency basis. No associated anomalies were noted in any of these patients and no mortality was encountered in this series.

Discussion

Gastrointestinal duplication are rare congenital lesions, they can be associated with life threatening complications. The clinical presentation can vary from asymptomatic abdominal mass to a clinical bowel obstruction or peritonitis. The aim for the management of GIT duplications should be to make a correct diagnosis and to provide treatment before the onset of symptoms or complications. The clinico-pathological features in our series support many of the findings reported in other recent reviews Puligandla et al (2003). With respect to clinical Presentation, 76% of the patients were below the age of 5 years at diagnosis with clinical signs and symptoms of vomiting, abdominal distension, pain or the presence of an abdominal mass. Of the 17 cases, 75% of the neonates presented as emergency cases, and all of these patients were diagnosed as having duplication cysts only at the time of laparotomy or after pathological analysis of the resected specimen was made. Based on these findings duplications can present with complications as a result of inflammation or ulceration within the duplication cysts. The most frequent initial screening investigations for these patients were abdominal ultrasound scan. In conditions in which the diagnosis of duplications was not clear, additional investigations were done which include abdominal C.T. Scan, contrast studies. The diagnosis of the duplication cysts on ultrasound is based on the thickness of the muscular wall; the findings of the peristalsis, sometimes evident in the cystic wall of the enteric duplications may be useful in distinguishing enteric duplication cysts from other lesions Richard D.S. et al (1996). C.T. scan abdomen is the investigation of choice in diagnosing duplication cysts, showing enhancement of the rim after injecting contrast medium. If after other appropriate investigations the diagnosis remains unclear laparoscopy be used to confirm the diagnosis in elective cases.

One case was diagnosed prenatally as an intraabdominal cyst and was lost on follow up and presented on emergency with signs and symptoms of obstruction. On laparotomy it was found to be a gastric duplication cyst which was operated successfully. This is a very low rate of antenatal diagnosis as compared to recent literature Bhat N.A et al (2001), Correia-Pinto J. et al (2000). The surgical treatment of the gastrointestinal duplication is largely dictated by the nature of presentation, the type of lesion and its relation to the normal anatomic structures. Attention to vital structures was considered when attempting to resect an intestinal duplications cyst. In most instances cystic

uplications can be completely resected, as in our series. In some cases resection of normal intestine along with the lesion was done because of the intimate attachment of the common wall or because of the cyst would compromise blood flow to the adjacent intestinal segment. Resection of the tubular duplication follows the same principles as cystic duplications but may prove difficult, especially when the patient has a long tubular segment or total intestinal duplication involving the small bowel. We had only one case of tubular duplication extending from caecum to sigmoid colon (A blind loop), wherein complete resection and anastomosis was done in this patient. Rectal duplications can be approached transanally or through midline posterior sagittally. We had one patient of rectal duplication cysts in our series, which was excised completely through the midline posterior sagittal approach. The pathological features of GIT duplications in this series support many of the findings reported in other large reviews Holcomb G.W III et al (1989), Ildstad S.T et al (1998), Iyer C.P et al (1995). First, most duplications are cystic in nature with 95% of the lesions being cystic in our series. This frequency is similar to that reported in a large composite review Macpherson R.I (1993). Second, the ileum appears to be the most common location for duplications accounting to 38.7% of the lesions identified in the series. Of note, gastric mucosa was found in 27.8% of all duplications in all locations, including the colon and rectum. Postoperative complications included wound infection in our patient with no major complication was encountered.

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