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Mini Review

Colonic Duplication in Children: A Review Article

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Abstract

Enteric duplications are rare congenital anomalies found anywhere from mouth to anus. Colonic duplications (CD) constitute about 13% of all enteric duplications. Patients with CD may necessitate intermittent hospital admissions and clinical findings are nonspecific. Definitive diagnosis can only be made during surgical intervention and surgical treatment is the cornerstone in the management of these children. The topic is discussed under the light of relevant literature with a brief a brief literature review.

Keywords: *Colonic Duplication; Surgical Treatment; Children*

Introduction

Enteric duplications (ED) are rare congenital anomalies and can occur anywhere in the gastrointestinal tract from mouth to anus [1]. Sites of involvement include ileum (33%), esophagus (20%), colon (13%), jejunum (10%), stomach (7%) and duodenum in 5% of cases [2-4]. More than 80% of patients present before the age of 2 years and presentation types vary from case to case and include nonspecific findings like abdominal pain and mass, acute abdomen or intestinal obstruction like volvulus or intussusception and rectal bleeding [5-7]. The aim of this study is to focus on characteristics of colonic duplications in children and to discuss the topic with regard to relevant literature with a brief literature review.

Discussion

Alimentary tract duplications in children are rare congenital anomalies commonly seen under the age of 2 years as an acute abdomen or bowel obstruction [8,9]. The incidence of gastrointestinal duplications is 1 in 4500 autopsies [10]. The first report of ED was made by Calder in 1733 and the term "Duplications of the Alimentary Tract" was coined by Ladd in 1937 [6,11]. In a meta-analysis comprising 580 cases it was found that 80% of lesions occurred in the abdomen and 20% in the chest [12]. There are numerous terms for defining these masses and include enterogenous cysts, giant diverticula, ileal or jejuna duplex and unusual meckel diverticula [7].

The etiology of EDs is still unclear and it has been believed that it occurs between 4^{th} and 8^{th} weeks of gestation [13]. There several proposed theories to explain the pathophysiology of EDs suggesting that the origin of ED can be multifactorial and include the theories of split notochord, luminal recanalisation, partial twinning, persistent embryonic diverticula and intrauterine vascular accident [2,3,14-16].

EDs have 3 characteristics in common and these are epithelial lining containing alimentary mucosa, smooth muscle envelope and close attachment with gastrointestinal tract showing common wall [13]. Structurally they can be cystic in 80% and tubular in 20% of cases and

cystic duplications are not related to adjacent intestinal lumen whereas tubular lesions may be related to intestinal lumen [17]. It has been reported that ectopic tissue is present in 25 - 30% of duplicated specimens and most common types of ectopic tissues are gastric followed by pancreatic tissue [6].

Presentation of colonic duplication is variable and can be asymptomatic in 10% of patients and can be discovered accidentally at surgery [18]. Vague abdominal pain and distention, vomiting, constipation or failure to thrive may be observed. As an emergency setting, the children may present with an acute intestinal obstruction due to intussusception or volvulus. If there is ectopic gastric tissue in the epithelial lining of duplicated colon rectal bleeding may be observed. Extragastrointestinal anomalies including genital, urinary or cardiovascular systems have been reported in 80% of patients with colonic duplications [19,20].

Imaging findings may be helpful in diagnosing colonic duplications in children. Plain abdominal X-ray is usually nonspecific and shows features of intestinal obstruction and air filled intestinal loops. Ultrasonography (US) is the imaging modality of choice in the diagnosis of ED but is operator dependent. Classical findings of uncomplicated cystic EDs are the presence of a cyst adjacent to the gut with double-wall or muscular sign (gut signature sign) but US may be nonhelpful in diagnosing tubular duplications [13]. Due to ionizing radiation computerized tomography (CT) is not typically performed to evaluate the EDs but may depict location and extension of duplication and anatomical relationship with surrounding structures as well as complications like volvulus [13].

The treatment in colonic duplications is surgical excision of the duplicated intestinal segment. The aims of surgery are to relieve the symptoms, to eliminate the risks of complications like volvulus, intussusception or bleeding from an ectopic gastric mucosa. Resection of duplicated colonic segment can also decrease the risk of adenocarcinoma because the occurrence of adenocarcinoma in the duplicated colon is higher than duplications located at any other locations [21,22]. Other surgical treatment options in especially extensive tubular colonic duplications include cyst marsupialization, partial cystectomy and mucosal stripping.

Conclusion

In conclusion, colonic duplications in children may be a challenge for clinicians with regard to not the surgical treatment but the clinical diagnosis because these cases usually cannot be diagnosed usually before surgical intervention. Significant morbidity and even mortality may be observed if these patients are left untreated. A high index of suspicion is necessary to recognize this rare anomaly and clinicians should keep this entity in their minds in children with nonspecific complaints of gastrointestinal tract including abdominal pain, vomiting or intestinal obstruction. These patients should be consulted to pediatric surgeon immediately and be managed promptly for an uneventful recovery.

Bibliography

1. Mirshemirani A., *et al.* "Diphallus with imperforate anus and complete duplication of rectosigmoid colon and lower urinary tract". *Iranian Journal of Pediatrics* 20 (2010): 229-232.

2. Hur J., *et al.* "Imaging features of gastrointestinal tract duplications in infants and children: from esophagus to rectum". *Pediatric Radiology* 37 (2007): 691-699.

3. Berrocal T., *et al.* "Imagen radiológica de las duplicaciones del tubo digestive". *Radiologia* 46 (2004): 282-292.

4. Sharma S., *et al.* "Enteric duplication cysts in children: a clinicopathological dilemma". *Journal of Clinical and Diagnostic Research* 9 (2015): 8-11.

5. Liaqat N., *et al.* "Enteric duplication in children: a case series". *African Journal of Paediatric Surgery* 11 (2014): 211-214.

6. Keckler SJ and Holcomb GW. "Alimentary tract duplications". In: Holcomb GW, Murphy JP editions Ashcraft's Paediatric Surgery. 5th edition. Philadelphia: Sanders Elsevier (2010): 517-525.

7. Lund DP. "Alimentary tract duplications". In: Grosfeld JL, O'Neill JA, Fonkalsrud EW, Coran AG, eds. Paediatric Surgery". 6th edition. Philadelphia: Mosby Elsevier (2006): 1389-1399.

8. Kekez T., *et al.* "Colonic duplication in an adult who presented with chronic constipation attributed to hypothyroidism". *World Journal of Gastroenterology* 14 (2008): 644-646.

9. Merrot T., *et al.* "Duodenal duplications: clinical characteristics, embryological hypothesis, histological findings, treatment". *European Journal of Pediatric Surgery* 16 (2006): 18-23.

10. Tabari AK. "Complete colonic duplication in children". *Caspian Journal of Internal Medicine* 3.2 (2012): 436-439.

11. Ladd WE. "Duplications of the alimentary tract". *Southern Medical Journal* 30 (1937): 363-371.

12. Heiss K. "Intestinal duplications". In: Oldham KT, Colombani PM, Foglia RP, eds. Surgery of infants and children: scientific principles and practice". Philadelphia: Lippicott-Raven (1997): 1265-1276.

13. Nebot CS., *et al.* "Enteric duplication cysts in children: varied presentations, varied imaging findings". *Insights Imaging* 9.6 (2018): 1097-1106.

14. Macpherson RI. "Gastrointestinal tract duplications: clinical, pathologic, etiologic, and radiologic considerations". *Radiographics* 13 (1993): 1063-1080.

15. Letelier AM., *et al.* "Duplicacion intestinal: Diagnostico y tratamiento de una condicion inusual". Revista chilena de cirugía 61 (2009): 171-175.

16. Palacios A., *et al.* "Prenatal sonographic findings of duodenal duplication: case report". *Journal of Clinical Ultrasound* 41.1 (2013): 1-4.

17. Stefanidis K., *et al.* "A rare presentation of colonic duplication cyst: report of a case and review of literature". *JBR-BTR* 95 (2012): 71-73.

18. Poulson EC and Mahmoud NN. "Sigmoid colon duplication cysts". *The American Journal of Surgery* 74 (2008): 250-252.

19. Kaur N., *et al.* "Hindgut duplication-case report and literature review". *Pediatric Surgery International* 20 (2004): 640-642.

20. Blickman JG., *et al.* "Colonic duplications: clinical presentation and radiologic features of five cases". *European Journal of Radiology* 59 (2006): 14-19.

21. Inoue Y and Nakamura H. "Adenocarcinoma arising in colonic duplication cysts with calcification: CT findings of two cases". *Abdominal Radiology* 23 (1998): 135-137.

22. Mourra N., *et al.* "Colorectal duplication in adults: report of seven cases and review of the literature". *Journal of Clinical Pathology* 63 (2010): 1080-1083.

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