

## ANATOMIC VARIATION OF INTESTINAL TRACT (SMALL INTESTINAL TUBULAR DUPLICATION INFREQUENT SOURCE OF INTESTINAL OBSTRUCTION IN CHILDREN)

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### ABSTRACT

**Background:** Intestinal tract duplications are infrequent congenital abnormalities. The common perinatal demonstration is an abdominal lump. When it occurs in upper gastrointestinal tract has accompanying respiratory manifestation, but duplications in the lower gastrointestinal tract can present clinically as an intestinal obstruction, perforation, nausea, Vomiting, bleeding of lower GIT, or may be symptomless, or known as a related clinical manifestation. Eighty five percent of intestinal tract are identified in children under two years of age. These anomalies can be seen along the whole gastrointestinal tract from the esophagus to the lower end part of anus, but mostly occurs in ileum, and frequently has seen as a cystic lesion at the mesenteric border of the intestine but rarely tubular duplication can be occurred. The best way to approach is the surgical resection and anastomosis.

**Materials and Methods:** During the laparotomy in the Nangarhar Regional hospital Jalalabad in the department of General surgery. we find a 12-years-old patient with small bowel (ileum) tubular duplication. In spite of physical exam and imaging investigations, the diagnosis we made during laparotomy. Our current research has done in Nangarhar Reginal Hospital General Surgery Department from 2021-Jan to 2021-May.

**Findings:** Amongst Patients who admitted to Nangarhar Regional Hospital due to Peritonitis, we observed 1 case of the

Small intestinal duplication the patient was severely ill and also experienced weight loss during this period of time he received deferent medical treatments. The pain was sited in the periumbilical and lower abdominal quadrants. He cited month ago, He had a history of melena and diarrhea. The patient's abdominal Physical exam was atypic unless he has mild abdominal distention and severe tenderness in the lower quadrants of abdominal wall. Lab exams reveal leukocytosis 13000/mm<sup>3</sup>, 36% hematocrit, platelets 400000 and C Reactive Protein of 2 milligram/Liter, and biochemical laboratory investigation revealed unchanged. Abdominal erect position X-ray reveals free air in peritoneal cavity. Ultrasound shows free fluid in abdominal cavity.

**Conclusion:** We believe that we always remember the duplication of intestinal tract for unexplained and unclear Diagnostic finding. Because of the very bad prognosis and complications from the intestinal duplication like obstruction, hemorrhage, volvulus, and peritonitis.

**Keywords:** intestinal duplication, Intestinal obstruction, Gastrointestinal tract congenital anomaly.

## INTRODUCTION

The intestinal tract is originated from the endodermal part of the yolk sac and mesenteric vessels molded from the mesodermal Layer, mucosal and submucosal layer derived from the endodermal layer. The Vessels and adventitia, serosa, lamina propria, muscularis mucosae and submucosal connective tissue developed from mesodermal layer of the fetus. And the intestinal intrinsic nerves mostly arise from the relocation of neural crest into the submucosa based on the arterial supply. And intestinal tract is alienated in fetus into three main parts that so called, foregut, midgut and hindgut. Foregut include lower esophagus, stomach and duodenum till the major duodenal papilla get their blood supply from celiac truck. The midgut that is include duodenum distal to major duodenal papilla, jejunum, ileum and colon 2/3 right side revived their blood supply from Superior mesenteric artery and hindguts that is include 1/3 left side transverse, Descending, sigmoid colon and upper part of the rectum received their blood supply from inferior mesenteric artery and their branches (Soffers, J. et al, Zhou, Y. et al)

Changing during normal embryological development has been attributed following intestinal abnormality.

Esophageal atresia, anorectal atresia and intestinal duplication are the structural anomalies of embryological developments. There are more other congenital anomalies that arise in fetus in intrauterine life is peritoneal bands, mesenteric cysts, gastrointestinal discontinuation, ano-rectal atresia and intestinal duplication.

Specially, in the case of gastrointestinal tract duplications there is few embryological trails that had studied. Some of them are related to ecological factors, recanalization malformations, split notochords, and incomplete twinning. Each of these concepts suffers from not being able to recognize as a single reason. (Favara, B. E et al, BENTLEY, J. F., & SMITH, J. R. (1960).

Gastrointestinal tract replications are rarely congenital variances of nor well-known causes. Although they can be noticed in any part of the gastrointestinal tract from the upper GIT to lower end of GIT as (anus), they are most often recognized in the small bowel.

Duplication in GIT can be separated into 2 main forms first and common as a cystic, second & infrequently forms as a tubular structure. almost 85% of patients clinically present before the school age. (Fiorani, C et al)

And frequently common clinical manifestations are repeated abdominal pain, nausea, anorexia, vomiting and abdominal palpable Lump. (Puligandla, P. S., et al)

The peri-operative finding of intestinal duplication is hard and imaging investigations will be not enough for exact finding. Obstruction, hemorrhage, perforation, torsion, intussusception and malignancy can be seen in adults with duplicated intestine. (Holcomb, G. W., et al)

Our case meant to assess the clinical manifestation of duplicated intestine and the treatment of duplicated intestine with the literature. (9)

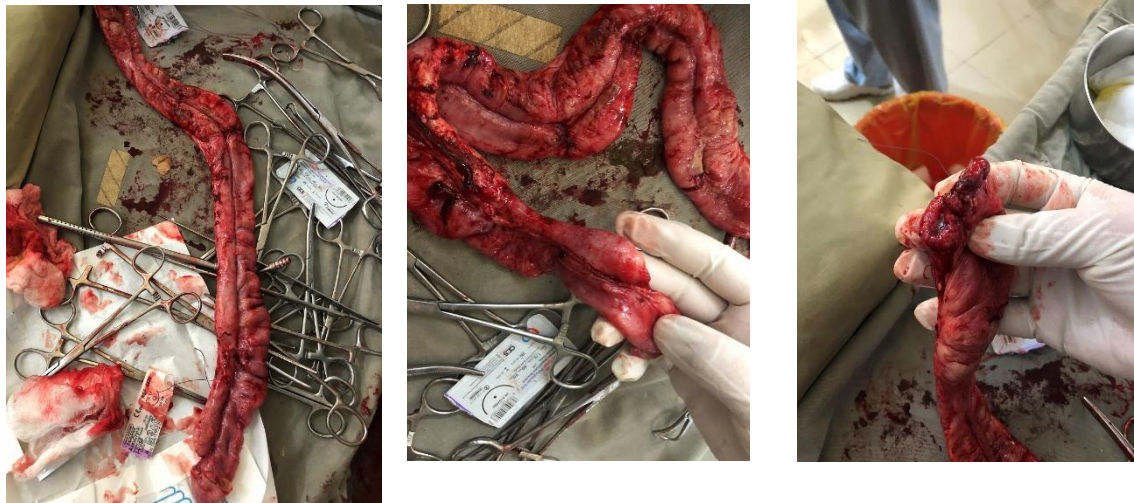


Figure. Which we took during operation from duplicated ileum( Nangarhar Regional hospital, Jalalabad Afghanistan, 2021)

## MATERIALS AND METHODS

Our case presentation was as follow!

One twelve years old boy single teenage was come to Nangarhar regional hospital General surgery department with chief complaints of abdominal pain, nausea, anorexia, vomiting, since few days & lost weight and become severely ill however, he got some medical therapy from local clinic and doctors but he admitted with the clinical manifestation of peritonitis with us. His past history was unknow with such disease. He suffers from abdominal pain for few days. He had experienced such episodes of abdominal pain for about last 6 months, has come to hospital for several times but unfortunately his problems treated medically. He also experienced weight loss during these 6 months and he got deferent medical treatments. His pain was located in the peri-umbilical region and lower abdominal quadrants. A several month ago, He had a history of melena. The patient's abdominal examination was unremarkable except mild mid abdominal distention and severe tenderness in the lower quadrants of the abdomen. Lab investigation shows leukocytosis 13000/mm<sup>3</sup>, 36% hematocrit, platelets 400000 and C Reactive Protein was 2 milligram per liter, and biochemical results were unchanged. Abdominal erect position X-ray showed a few intestinal free fluid levels. Ultrasound shows free fluid in abdominal cavity.

The patient was admitted to hospital in acute abdomen. After inquires we diagnosis the patient as a peritonitis with unknown origin, after laparotomy we find some intestinal contents that the peritoneal cavity was contaminated with ilial contents and fibrin clots (peritonitis).

## DISCUSSION

Fitz (Fiorani, C., et al)define duplicated intestine for the first time. In 1937, Ladd define duplicated intestine as the existence of a mature structure like intestine and as same as from the external to internal bowel wall. Its incidence described as one in every 10,000 live births (Ildstad, S. T., et al). intestinal duplication often occurs in the small and are bowel most

common in terminal part of small intestine. (Fiorani, C., et al, Puligandla, P. S., et al)

In our case, the duplication was seemed in the terminal part of small intestine about 60cm long tubular like structure during laparotomy. However, the tubular type occurred rarely. (Okur, M. H., et al, Spătaru, R. I., et al).

<sup>(10, 11)</sup> Round or cystic duplicated anomalies are frequently occurred than tubular structure . (Li, et al) he have further described the duplicated intestine as following types

(1) type I

(2) type II.

His classifies the duplicated intestine to its blood supply to its next intestine. (Fiorani, C., et al)

Type one intestinal duplications can be derived from any layer of four layer of intestine tract such as submucosa, inter- muscular, or sub serosal layer of the intestinal wall which shows its attachment, continuity, and detachment of the duplicated part to the adjacent part of the intestine. ( BENTLEY, J. F., et al) For example, duplications origins from the sub serosa may detach from the intestinal wall and lie next to the point of its origin.

Type II is intramesenteric small intestinal duplications, which we have seen in our case too. This type of duplications may attach its wall or open its lumen with the adjacent intestinal require a resection with its adjacent part of intestinal tract and anastomosis because of its blood supply and proximity with the adjacent part of intestinal tract. Cystic type of duplication frequently identified incidentally on an ante-natal or peri-natal sonography. (Bremer, J.L. (1952) according to the Srivastava et al research study it may appear as a gradually growing mass in abdomen in childs in the first 10 years of age. (Simsek, A., et al)

Unlike Mackle's diverticulum, they are located within the mesentery. Primary manifestations are in adults is a infrequent incidence. When presenting after the 20years of age, the clinical feature differs from abdominal pain, abdominal mass, fresh lower GIT bleeding which is common feature in melena which is more common in upper GIT, small Intestinal obstruction, intussusception, Torsion, and rarely malignancy in the duplicated cyst. (Macpherson R. I. (1993). )

In the 1984, there was a case of 21 years-old French man that was suffering from abdominal pain with recurrent GIT bleeding for 4 years. But after laparotomy it reveals peritonitis and on T99 scan it shows ectopic gastric mucosal ulcer and at terminal ileum on histopathology examination it reveals duplicated cyst of intestine. (Ben Amar, et al)

Approximately 80% of patients shows the symptoms before 2 years of age, the some of them remain symptomless and undiagnosed until the patient reach at their adolescent age.( Babür T. (2014). )

In my case it was a 12 years old boy who was misdiagnosed despite a repeated examinations such as physical, imaging until we had done laparotomy and then we find tubular duplication even in second time laparotomy.

Incidence of GIT duplications reported to be one in 4500. { Babür T. (2014)}.

Feature of GIT duplications are inconstant. The usual clinical features are abdominal pain, vomiting, distention, palpable lump, Peritonitis & bleeding. (Holcomb, G. W., Ildstad, S. T., Okur, M. H., et al).

Diagnosis of GIT duplications, especially of the small intestine is difficult but endoscopic examination of the small intestine even it is



challenging. Barium X-ray, Sonographic examination & CT Scan may play a diagnostic role. Duplications can be role out from other abdominal cystic mass by containing normal GIT mucosa, nonetheless one third of duplicated intestine my has ectopic stomach mucosa. (Peksoy, I., et al) though Ectopic stomach mucosal epithelium may cause peptic ulceration, hemorrhage, perforation and fistula formation.  $^{99m}\text{Tc}$  is taken by and it can show intestinal duplications containing ectopic gastric mucosa depending on the width of the mucosa. Babür T. (2014).

In our patient the pathologic evaluation of the specimen shows ectopic stomach mucosa, with past history of black stool.

In our patient Duplicated intestine was not malignant , however malignancy in adults are rare.( WRENN E. L., Jr (1962). Jung, K. H., et al)

In spite of advances Evaluation, the exact diagnosis of the case may be made after surgery. intestinal duplications can cause volvulus, intussusception, hemorrhage and perforation. Hypertrophic ileal duplication, lymphoma, gastrointestinal stromal tumor and Crohn's disease should be considered as part of differential diagnosis of ileum duplications.

The best surgical method is complete resection of the duplicated part of intestine and repair by end-to-end anastomosis or in the case of peritonitis ileostomy done and after returning the patient to stability (hemodynamically) then anastomosis done.

If patient is symptomless non-surgically supervised. But in our case there was contaminated of peritoneal cavity we resected the whole duplicated segment of the intestine and followed by ileostomy.

In Our case insomuch the patient duplication was perforated and the patient was in Toxic condition we prefer to done the ileostomy and resection the duplicated part of intestine because the duplication was within the ileal mesenteric border. After the one month we repair the ileum but the patient went to severe malnutrition due to the lack of nutrient absorption because the large part of ileum was resected after repair the patient getting well day by day and improve his health.

Laparoscopic intervention, especially in the case of large lesions, may be safely performed with good prognosis. ( Rees, C. M., et al, )

Advancements in Trans-anal endoscopic microsurgery is the also good method for small to moderate sized intestinal duplications.( Rees, C. M., et al, Ben-Ishay, O, et al)

(21, 22)

## CONCLUSION

We believe that we always remember the duplication of intestinal tract for unexplained and unremarkable Diagnostic finding.

Because of the very bad prognosis and complications from the intestinal duplication like obstruction, hemorrhage, volvulus, and peritonitis.

We are lack of facility and the economic statues of the peoples are not well-known during laparotomy we must keep in to investigate for the duplication of intestinal tract.

If someone has unexplained abdominal pain, intestinal duplication should be supervised and role-out for intestinal duplication, once it has known duplication of intestine it may resect to prevent the transformation to malignancy.

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