



# Pediatric Ileocolica Invagination: A Case Report

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## Abstract:

*Invagination or intussusception is an inversion of intestinal segments into other intestinal segments which is the most common cause of intestinal obstruction in infants and children. Early diagnosis and therapy can cause intestinal ischemia, perforation, and peritonitis which can be fatal. Trias classic symptoms consist of abdominal pain, vomiting, and blood in the stool. Invagination often occurs in children under 2 years old, with the highest incidence in children aged 4 - 9 months. The most common cause of invagination is idiopathic. Reportedly a boy, 10 months with a history of mucus with blood, vomiting, flatulence, history of colds cough. Physical examination reveals that the child is aware and active. The abdomen appears distended, palpable mass such as sausages, and intestinal hyperperistaltic. In the rectal toucher, there is mucus and blood on the handscoon. Investigations found anemia and leukocytosis. Stool examination showed blood, erythrocytes 4-6 LPB and leukocytes 8-10 LPB. Radiological examination of the abdomen appears to dilate the intestine (colon) with a coffee bean sign, the impression is in accordance with the picture of invagination. Abdominal ultrasound impression according to the picture of invagination (colo-colica). The patient was diagnosed as ileocolica intussusception and acute diarrhea without dehydration.*

## Keywords:

*Invagination; intussusception; children; bloody diarrhea*

## I. Introduction

Invagination or intussusception is an emergency condition in which one intestinal segment is inverted into another intestinal segment. Invagination is began by an inversion of proximal intestinal segment (intussusceptum) to distal intestinal segment (intussusciptien). Invagination is the most common etiology of intestinal obstruction on infant and children under five years of age.<sup>1, 2</sup> this is a demonstrating case report aimed to include invagination as one of important differential diagnosis when mucous and blood is found on the stool. According to Nicolas et al 2001 in Christian (2020) the omnipresence of the disease is compounded by the socio-economic instability that disrupts the health system, the cost of medicines and the difficulty of distributing them and monitoring treatment.

## II. Case Presentation

According to Nainggolan (2020) risk factors for stunting in children aged 24-36 months in Serdang Bedagai District are birth weight, breastfeeding history (exclusive), and birth length. A 10-months-old boy was presented to the emergency department of Zainoel Abidin General Hospital in July 29th, 2019 suspecting to have dysentery and cared by the Pediatric Gastroenterohepatologic Department.

History showed that bloody stool was found one day before hospital admission, five times in a day, liquid consistency, and  $\pm \frac{1}{4}$  glass volume each. In 12 hours prior admission, patient complained flatulence and two times of vomiting, each containing  $\frac{1}{2}$  glass volume of undigested food. There was no history of fever.

Physical examination showed that patient was severely ill with details of weight 7.500 grams (2 to +2 SD WHO-NCHS) and length 70 cm (< -2SD WHO-NCHS). The patients was deemed to be compos mentis and no cyanosis or chest retraction found. The heart rate was 110 times/min, respiratory rate was 35 times/min and temperature was 36,8 C. The conjunctiva was pale. The palpation of abdominal showed abdominal distention, sausage-like palpable mass and increased peristaltic activity. In the rectal toucher test, mucous and bloody stool was found on investigator's medical glove. Peripheral blood test revealed Hemoglobin 10 g/dL, leukocytes 19.500/mL, and thrombocytes 407.000/mL. Faecal test also found 4-6 erythrocytes/HPF, 8-10 leucocytes/HPF, mucous (+), blood (+), undigested food (-), helminth eggs (-), and amoeba (-). Abdominal radiology test showed intestinal dilataion (colon) with coffee bean sign corresponding to invagination sign. The results of abdominal ultrasonography was invagination (colo-colica). NGT was inserted on patient together with IVFD 4:1 treatment 31 cc/hr, ceftriaxone IV 250 mg 12 hourly, metronidazole IV 60 mg 8 hourly, metamizole IV 100 mg 8 hourly, ranitidine 8 mg 8 hourly, ondansetron 1 mg as needed, probiotic 1 x1 sacc, Zync syr 1 x 20 mg, oralit 50 cc per diarrhea. Patient was consulted to the Pediatric Surgery Department for an explorative laparotomy milking procedure and stoma preparation. Patient was discharged after 6 days in the hospital in stable condition.



**Figure 1.** Baby Gram



**Figure 2.** Abdominal Ultrasonography  
Colo-colica as Invagination Sign

### III. Discussion

Intussusception or intussusception is important to be considered when classic trias which were abdominal pain, vomiting, bloody stool is found commonly in children under two years of age. Intussusception is an inversion of one intestinal segment into another intestinal segment. This is a common etiology of intestinal obstruction in children with higher incidence between

4 to 9 months of age. Missed diagnosis and early therapy causes intestinal ischemia, perforation, and peritonitis leading into death.<sup>1,3</sup> In Indonesia, there is a difference number of invagination cases between urban and rural hospitals, which is 17,2 and 5,8 per year.<sup>4</sup> Invagination was reported as seasonal case which is higher in spring, summer and middle of winter. In Thailand, the incidence is increased between September and January as also April. This increase is along with winter and summer which is known as the peak incidence of respiratory and gastroenteritis infection.

There was no confirmed etiology found in 90% of invagination cases. However, common etiologies of invagination includes polip, Meckel diverticulum, Henoch Schonlein Purpura (HSP), lymphoma, parasite, adenovirus infection, and rotavirus. Other predisposition factors include intestinal motility change, excessive peristaltic movement, fecal obstruction, and diet change. In many cases, the etiology could not be classified known as idiopathic. Invagination frequently attacks children in the first two years of life. There is a possibility that submucous lymphoid tissue of distal ileum is enlarged due to reactive hyperplasia and center of invagination related to viral infection.<sup>9</sup> Reported patient complained that there were cough and runny nose 5 days prior to liquid stool containing mucous and blood, flatulence as also vomiting.

Abdominal physical examination showed distended abdomen. This is a common finding in invagination as a sign of early peritonitis. In case of total obstruction, a tumor-like mass will be palpable causing increased intestinal peristaltic. This is caused by progressive obstruction followed by progressive edema resulting into obstructive manifestations they are flatulence with clear intestinal peristaltic movement, gastric reflux and dehydration.

Abdominal X-Ray and ultrasonography (USG) was used to support the diagnosis of invagination. Finding such as abdominal mass will support the diagnosis. Abdominal USG is a standard non-invasive diagnostic technique accurate to 100%. It can be used to identify invagination by detecting doughnut sign or target sign on horizontal view and pseudokidney sign on longitudinal view. It is also used to show invagination reduction with hydrostatic technique or gas enema.

Theoretically, barium enema contrast is assumed as the gold standard for the diagnosis of invagination accurate to 100%. CT-scan and Magnetic Resonance Imaging (MRI) can be used for the diagnosis with lower accuracy compared to USG. Besides, barium enema test takes longer time and preparation leading to worse prognosis if the reduction is done more than 24 hours. Gas enema was reported to have 84% effectivity in 181 cases.<sup>6,10</sup> However, we did not use this test because the characteristics found in USG had fulfilled the criteria of invagination.

Treatment of this patient included nasogastric tube (NGT) insertion, chateterization, antibiotic treatment, and operative reduction. This was in accordance with theory mentioned that early treatment on pediatric invagination is started with fluid resuscitation assessed clinically based on electrolytes count on blood sample for complete hemogram. Rehydration is highly important before reduction. NGT insertion is not indicated in children with vomiting. Patient later received prophylaxis antibiotic before moved to radiology department for reduction.

Before 1970, invagination reduction was done operatively before barium enema and gas enema was found. Surgery was indicated in case of failed non-operative reduction and pediatric clinical finding of intestinal ischemia, peritonitis, septicemia, as also pathological lead point. Patients with those cases could not receive radiology reduction because peritonitis is a contraindication of radiological reduction.

Some invagination cases were spontaneously reduced. However, untreatable cases will lead to further complication such as intestinal bleeding, necrotic, perforation with peritonitis, shock, sepsis, recurrent invagination as also death. This reported patient did not have shock or high fever showing complication. Prognosis is directly related to the onset of investigation before reduction. Therefore, the prognosis in this case report is good with high awareness of the diagnosis and correct treatment to decrease the mortality rate.

#### **IV. Conclusion**

A 10-months-old baby, early diagnosed with dysentery, was then diagnosed with ileocolica intussusception and acute bloody diarrhea without dehydration. The diagnosis of intussusception was made based on abdominal pain, vomiting, and bloody stool. Abdominal ultrasonography (USG) was the standard non-invasive diagnostic technique with 98% sensitivity and 100% specificity. Non-operative reduction is done if patient do not have any contraindication such as intestinal perforation or peritonitis. This patient did not receive radiological reduction as contraindication was found that was peritonitis sign so that explorative laparotomy milking procedure and stoma preparation as the operative reduction was done. Prophylaxis antibiotic treatment was given to prevent septicemia. Early diagnosis and intervention is highly important to achieve better outcomes and prevent death. Patient was discharged after 6 days in the hospital with stable condition.

#### **References**

- Christian, M.A. et al. (2020). Epidemiological profile of Ascariasis in Provincial General Reference Hospital of Kinshasa, Democratic Republic of the Congo. Britain International of Exact Sciences (BIOEx) Journal Vol 2 (2): 541-546.
- Ein, S.H & Daneman A. Intussusception . Dalam : Grosfeld, Jay L et al. Pediatric Surgery. Edisi ke-6. USA: Elsevier Inc; 2006: 1313-1337.
- Giak, C.I; Singh, H.A; Nallusamy, R Leong TY, Ng TL, Bock HL. Epidemiology of Intussusception In Malaysia: A Three-Year Review. Southeast Asian J Trop Med Public Health. 2008; 39: 848-55.
- Mulyaningrum, P. (2020). Prevalensi Penyakit Invaginasi Pada Anak Di Rumah Sakit Umum Pusat Haji Adam Malik Medan Dengan Rumah Sakit Umum Dokter Piringdadi Medan Periode 2006- 2009. Skripsi. USU.
- Nainggolan, R., Artonang, E.Y., and Sudaryati, E. (2020). Relationship of Child Individual Factors with Stunting Incidence in Children Aged 24-36 Months at Serdang Bedagai District. Britain International of Exact Sciences (BIOEx) Journal Vol 2 (1):436-441.
- Papadakis, K and Feins, N.R. Intussusception. Dalam: Gellis, S.S and Kagan, B.M. Current Pediatric Therapy. Edisi ke-17. Amerika Serikat: W. B. Saunders Company; 2010
- Ramachandran, P. (2009). Intussusception hal: 485- 490. Dalam: Puri, P; Höllwarth, M. Pediatric Surgery: Diagnosis and Management. London: Springer Dordrecht Heidelberg.
- Silen, W. Intussusception and Other Cause of Obstruction Dalam: Silen, W. Cope's Early Diagnosis of the Acute Abdomen. Edisi ke 2. USA: 2010; 178-187

- Sondheimer, J.M. Intussusception. (2003). Dalam: Hay, W.W; Jr, Hayward A.R; Levin, M et al. Current Pediatric Diagnosis & Treatment. Edisi ke-16. Singapore: The McGraw-Hill Companies Inc.
- Stringer, M.D; Oldham, K.T and Mouriquand, P.D.E. Pediatric Surgery and Urology: Long-term Outcomes. Edisi ke-2. USA: Cambridge University Press. 2006; 311-312.
- Waag, K.L. (2006). Intussusception. Dalam: Puri, P and Hollwarth, M. Pediatric Surgery. New York, Springer-Verlag. 2006: 313-32.
- Wyllie, R. Ileus, Adhesion, Intussusception and Close-Loop Obstructions. (2004). Dalam: Behrman, R.E; Kliegman, R.M and Jenson, H.B. Nelson Textbook of Pediatrics. Edisi ke-17. Amerika Serikat Elsevier Science. Tate, J.E; Steele, A.D; Bines, J.E., Zuber PLF, Parashar UD. Research Priorities Regarding Vaccine and Intussusception: A meeting Summary. Elsevier.