Postoperative Intussusceptions in Infants and Children: A Case series

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ABSTRACT

Objective — *To document the clinical presentation, operative findings and surgical procedures performed in patients who presented with postoperative intussusception.*

Study design — *Retrospective descriptive case series.*

Place & Duration of study — *Department of Pediatric Surgery, Children Hospital & University of Child Health Sciences Lahore, from January 2018 to December 2023.*

Methods — *The file records of all the patients with postoperative intussusceptions managed during the study period were reviewed. The data were collected for the number of cases encountered, demographic characteristics, clinical details such as primary diagnosis and surgeries, postoperative signs and symptoms, type of intussusception, surgical procedure performed to deal with the intussusception and follow up. Descriptive data were presented in tabular form with number and percentages.*

Results — *In this study ten patients with postoperative intussusception were managed at our institution. This included seven males and three females. The median age at presentation was two years. These patients were primarily operated for different surgical conditions. The most common clinical presentation included gradual abdominal distension, bilious nasogastric aspirate, and constipation after few days of primary surgery. All patients were operated again. Eight patients had ileo-ileal intussusception, one patient each had jejuno-ileal and ileo-colic intussusception. The secondary surgical procedure was tailored according to the intra-operative findings. Manual reduction of the intussusception was performed in eight patients while resection and end-to-end anastomosis were required in two children.*

Conclusion — *The data highlighted the importance of maintaining a high index of suspicion for postoperative intussusception in any pediatric patient who develops symptoms suggestive of intestinal obstruction after primary abdominal surgery. Early recognition and prompt intervention following diagnostic imaging remain crucial for optimal outcomes.*

Key words — *Intestinal obstruction, Postoperative intussusception, Bilious vomiting, Laparotomy, Ultrasonography.*

INTRODUCTION:

Intussusception refers to the telescoping of one segment of the gut into an adjacent segment. It is a well-known cause of partial or complete intestinal obstruction, particularly in children less than two years of age.[1,2] However, postoperative intussusception is a rare condition in children. The incidence of postoperative intussusception after laparotomy is 0.01 to 0.25%.[3] This complication can manifest following different surgical procedures such as appendectomy, feeding jejunostomy, nephrectomy, and surgery for Hirschsprung's disease and others.[4] The etiology is thought to be multifactorial. Impaired gut peristalsis may due to various causes such as excessive bowel handling, abnormal serum electrolytes, anesthetic agents, postoperatively

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administered medications or impaired bowel innervations.

The classical presentation of intussusception in infants include colicky abdominal pain, a palpable sausage-like mass in the abdomen, and stools resembling currant jelly. In patients with postoperative intussusception this typical triad of symptoms is usually not apparent.[1,4,5] Abdominal pain may be misconstrued as surgical incision pain or masked by postoperative analgesics, while abdominal distension and bilious aspirate may be mistaken for postoperative paralytic ileus.[4] Consequently, the atypical presentation of postoperative intussusception often leads to diagnostic challenges in the early postoperative period, potentially resulting in delayed recognition and subsequent serious complications such as bowel ischemia. This study was conducted to review all patients who developed postoperative intussusception and managed at our unit. This aimed at adding evidence based data to world literature.

METHODS:

Study design, place and duration: This was a retrospective descriptive study conducted in the Department of Pediatric Surgery, Children Hospital & University of Child Health Sciences Lahore, from January 2018 to December 2023.

Ethical considerations: This was a retrospective data collection for which IRB approval was taken under exemption category IERB letter No.73-A/CH-UCHS dated 8th August 2024.

Inclusion criteria and exclusion criteria: Patients who underwent primary abdominal surgery for any cause and then develop postoperative intestinal obstruction due to intussusception were included. Patients with postoperative paralytic ileus or any other etiology leading to intestinal obstruction were excluded.

Sample size estimation: All patients who were diagnosed as having postoperative intussusception during the study period were enrolled.

Study protocol: Files were reviewed and data collected in relation to the frequency, demographic characteristics, clinical details including like symptoms and signs, investigations performed, primary pathology, intra-operative findings during re-exploration, type of intussusception, surgical procedure required, postoperative complications and follow up after second laparotomy.

Statistical analysis: The data were entered and analyzed using SPSS v 23. The results were reported as number and percentages using tabular format.

RESULTS:

A total of ten patients were included with seven males and three females. The median age was two years. The mean time of onset of symptoms was 4.5 days after primary surgery. The clinical symptoms and signs were abdominal pain, abdominal distension, and non-passage of stool. The increase in the volume of bilious nasogastric aspirate was also noted. Two patients developed ileo-ileal intussusception after nephrectomy for Wilms' tumor. Two patients of Hirschsprung's disease developed postoperative intussusception after diversion ileostomy and primary transanal endorectal pull through (TERPT) respectively. An eight-year-old female had postoperative intussusception after open appendectomy. Three years old male had postoperative intussusception after feeding jejunostomy made for gastric outlet obstruction due to corrosive stricture.

Of the total eight patients had ileo-ileal intussusception, one case of ile-ocolic intussusception, while one patient had jejuno-ileal intussusception. In one patient intussusception was secondary type with Meckel's diverticulum as a lead point.

All patients underwent exploratory laparotomy and manual reduction was possible in eight patients. In all these, intussusceptions involved small bowel. One patient required resection of the gangrenous bowel while resection of Meckel's diverticulum was done in one patient. No complication was observed in all the patients on long term follow up. The details related to the patients and clinical management are given in table I and II.

DISCUSSION:

Postoperative intussusception is a rare but serious surgical complication of abdominal procedures. In this study ten patients were managed over a period of six years. The incidence of postoperative intussusception is reported as 0.01-0.25% following laparotomies. This accounts for 5-10% of all early postoperative intestinal obstructions.[1] Postoperative intussusception can occur after any surgery and is not limited to abdominal surgeries only. In our series a patient of inguinal hernia also developed this complication. In another patient who underwent primary TERPT where procedure was done through anal canal without opening abdomen also developed the same

Table I: Demography and Clinical Details

Age (Years)	Gender	Onset of symptoms	Hospital stay
8	Female	5th day	12 days
3	Male	7th day	13 days
2 . 8	Female	3rd day	14 days
2	Female	4th day	21 days
1.25	Male	5th day	9 days
0 . 6	Male	4th day	6 days
4	Male	4th day	7 days
0.75	Male	2nd day	10 days
0 . 5	Male	4th day	10 days
11	Male	6th day	10 days

Table II: Primary Surgery, Type of Intussusception and Surgical Procedure Performed

Primary pathology	Primary surgery	Type of intussusception	Procedure done
Acute Appendicitis	Appendectomy	Jejuno-ileal	Manual Reduction
Gastric outlet obstruction	Feeding Jejunostomy	Ileo-Ileal	Manual Reduction
Hirschsprung's disease	Loop ileostomy	Ileo-Ileal	Manual Reduction
Hirschsprung's disease	Primary TERPT	Ileo-Colic	Resection and Anastomosis
Inguinal hernia	Herniotomy	Ileo-Ileal	Manual Reduction
Ileo-colic intussusception	Manual reduction	Ileo-Ileal	Manual Reduction
Right Wilms' tumor	Nephrectomy	Ileo-Ileal	Manual Reduction
Right Wilms' tumor	Nephrectomy	Ileo-Ileal	Reduction and Wedge Excision of Meckel's Diverticulum
Left Congenital diaphragmatic hernia (CDH)	Repair of CDH	Ileo-Ileal	Manual Reduction
Colonic stricture	Resection and end to end anastomosis for colon stricture	Ileo-Ileal	Manual Reduction

complication. Wali et al reported postoperative intussusception after Nissen fundoplication in a 14-months old boy.[6]

The pathophysiology of postoperative intussusception is still unclear. It may occur due to altered bowel motility, evaporative loss of fluid from the gut, electrolyte imbalance, and gut manipulation.[2,5] However, it does not explain the occurrence of intussusception following non-abdominal surgeries. In a study small bowel postoperative intussusception was found to be more common following abdominal surgeries and ileo-colic more common following non-abdominal surgeries.[5] In our series this complication developed more frequently in patients who underwent abdominal surgeries and ileo-ileal type was more frequent finding.

The clinical presentation of postoperative intussusception is usually different from the classical signs of intussusception in children as obstruction is usually at small bowel level. Thus signs and symptoms are just like small bowel obstruction with abdominal pain, distension and bilious vomiting. In postoperative period the cause is difficult to comprehend. These are noted early within the first week. Similar pattern was observed in this series. However, it may occur up to two weeks following surgery.[4]

The classical triad of intussusception as reported in infancy is not observed in postoperative period. Intussusception therefore is frequently confused with postoperative ileus.[7] This type of intussusception is usually idiopathic in nature. However, in one patient in this series Meckel's diverticulum was found as a lead point. The clinical diagnosis of

postoperative intussusception is challenging. The plain abdominal radiograph may be normal or show dilated small bowel loops. The delay in diagnosis can result in ischemia and necrosis.[2] This is noted in one of our patients. The treatment of postoperative intussusception is usually operative.[8] If diagnosed preoperatively, a trial of hydrostatic reduction can be given for ileocolic intussusception in stable patients. However, in our case series most of the patients were re-explored and manual reduction was possible in most of the patients who had ileo-ileal intussusception. One patient needed resection and anastomosis of gut and other had Meckel's diverticulum as a lead point also required resection.

Limitations of the study: This was a retrospective review of a record with a small number of patients. However, coming from a busy tertiary care university hospital it provides great insight into this rare condition that may inform practices.

CONCLUSION:

Postoperative intussusception is a rare and potentially serious surgical emergency. A high index of suspicion for intussusception should be kept in mind for any postoperative patient with persistent bilious aspirate and abdominal distension. Surgery is the treatment of choice.

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