

# Pattern of Intestinal Obstruction in Children – A Review of 200 Consecutive Cases

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## ABSTRACT

**Objective:** To identify the various causes of intestinal obstruction in children. **Design:** Retrospective study. **Place and Duration of Study:** Department of Paediatric Surgery, Allied Hospital, Faisalabad from July 1995 to June 2009. **Patients and Methods:** The record of all children, between the age of 1 to 14 years, who presented with intestinal obstruction during the study period was reviewed. **Results:** Two hundred children presented with intestinal obstruction. It was not an uncommon cause for admission from the emergency department (12.1%) and constituted 7.4% of the children operated in the unit. They were predominantly males

(75%). Average duration of symptoms was 3 days. The commonest causes were adhesions (31%), Meckel's diverticulum with band (15.5%), volvulus (12%) and incarcerated inguinal hernia (11.5%). Wound infection (11%) and wound dehiscence (4%) were the common complications. Mortality rate was 2.5%. **Conclusion:** Intestinal obstruction is seen not infrequently in children and is associated with significant morbidity. Adhesions especially post operative have emerged as a leading cause. Early recognition and prompt treatment are needed.

**Key Words:** Intestinal Obstruction, Post Operative Adhesions, Intussusception, Inguinal hernia, Meckel's Diverticulum.

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## INTRODUCTION

Intestinal obstruction is not an uncommon cause for surgical admission the world over. There are variations in the causes. The changes in the disease pattern over the years are documented in the literature<sup>1,2,3,4</sup>. It is a potentially life threatening condition. Early recognition and prompt treatment is needed. The purpose of this study is to identify the common causes in children and to compare them with other studies.

## PATIENTS AND METHODS

A retrospective review was undertaken at the Department of Paediatric Surgery Allied Hospital, Faisalabad to determine the incidence of various causes of intestinal obstruction in children. The records of 200 patients between the ages of 1 year to 14 years admitted with a diagnosis of acute intestinal obstruction, which needed surgical intervention for its relief, between July 1995 and June 2009 were reviewed. Patients who settled spontaneously on conservative management were not included in the study. At the initial presentation all cases were assessed by at least one of the authors. History, especially that of screaming attacks, vomiting, bilious

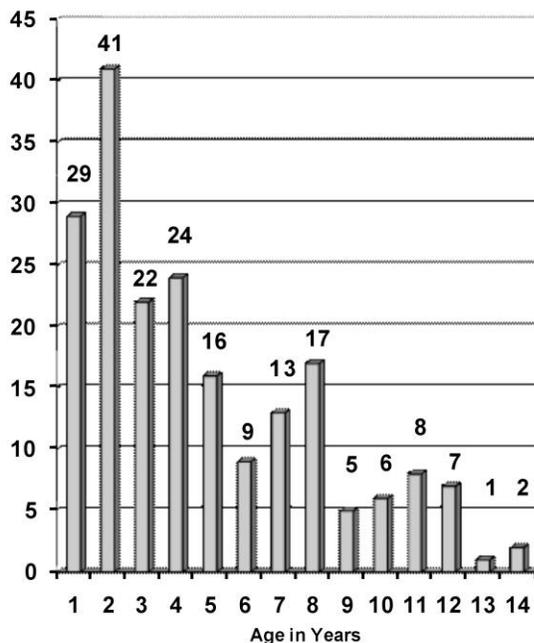
or otherwise, passage of bloody mucus per rectum, diarrhoea or constipation was elicited. In addition to a general physical examination, signs of dehydration, shock, sepsis and on abdominal examination the presence of a mass and palpable bowel loops were noted. Routine tests included a complete blood count, serum electrolytes and blood grouping and cross matching. A plain erect X-ray of the abdomen was obtained in all cases. An intravenous line (IV) was established in every case and a 1/5 dextrose saline solution infused. Electrolyte replacement was done as needed. A wide bore nasogastric (NG) tube was placed for continuous drainage. Nasogastric aspirate was replaced with lactated Ringer's solution. Broad spectrum antibiotics were administered. Where needed preoperative blood transfusion was given. Once stable they were operated upon by one of the authors. Operative findings were noted and the appropriate surgical procedure warranted by the diagnosis was performed. Post operatively the patients were kept on IV fluids and NG aspiration till return of bowel motility. Gradual feeding was then started. As most of the patients came from peripheral areas they were kept in the ward till the removal of sutures. The record was analyzed to find out the age of presentation, sex

distribution, duration of symptoms, type of lesion, overall complications and mortality rate.

## RESULTS

During the study period 200 children with acute intestinal obstruction were managed. This constituted 7.4% of all children operated upon and 12.1% of all children admitted through the emergency. They were predominantly males (75%). Distribution of the patients according to age is given in Figure I. Children under the age of 5 years were 132 (61%). The various diagnoses are listed in table I.

**Figure I: Age of Patients**



**Table I: List of Diagnosis**  
(n = 200)

Diagnosis	Cases	%
Adhesions	62	31
Meckel's Diverticulum with band	31	15.5
Volvulus	24	12
Incarcerated Inguinal Hernia	23	11.5
Intussusception	22	11
Congenital Bands	20	10
Hirschprung's Disease	5	2.5
Ascariasis	5	2.5
Congenital Diaphragmatic Hernia	4	2
Incarcerated Umbilical Hernia	4	2

The symptoms seen most frequently were vomiting (85%), constipation (70%) and abdominal pain (60%). The signs noted commonly were abdominal distension (60%), visible and palpable loops of intestine (52 %) and an empty rectum on PR in most cases.

Adhesions were the commonest cause seen in 62 (31%) cases. These were either inflammatory or post-operative. Tuberculosis was the cause in 6 cases. Post operative adhesions were seen in 28 (45%) cases. The nature of the previous surgical procedure varied in these cases (Table II).

**Table II: Nature of Previous Operation**  
(n = 24)

Nature of Previous Operation	Number
PSARP – Abdomino perineal	4
Laparotomy & Colostomy	4
Appendectomy	3
CDH	3
Closure of Ileostomy/ Colostomy	3
Pull Through for HD	2
Diaphragmatic Hernia	2
VP Shunt	2
Colostomy for Imperforate Anus	2
Nephrectomy for Wilms tumour	1
Post End to End Anastomosis	1

Meckel's diverticulum with a band as a cause of obstruction was seen in 31 (15.5%) cases. Volvulus of a loop of intestine was seen in 24 (12%) cases. Incarcerated inguinal hernia was seen in 23 (11.5%) cases. All were males and 21 (91%) were below the age of 4 years. Intussusception was seen in 22 (11%) cases. The majority of cases 15 (68%) were aged more than 5 years. Congenital bands were seen in 20 (10%) cases. Ascariasis was the cause in 5 (2.5%) cases. The dead and dying worms had jumbled up in places and caused the obstruction. Five (2.5%) cases with Hirschprung's disease presented with acute intestinal obstruction. All these cases had a history of delayed passage of meconium after birth. An obstructed umbilical hernia was seen in 4 (2%) cases. Two of these cases had associated Hurler's syndrome. Four cases (2%) with a congenital diaphragmatic hernia of the left side presented with acute intestinal obstruction.

Average duration of hospital stay was 5 days. Superficial wound infection was seen in 22 (11%)

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cases. Dehiscence of the wound developed in 8 (4%) cases. Mass closure was done in all. Five cases (2.5%) expired.

## DISCUSSION

Intestinal obstruction is a common cause for admission to the emergency department in all ages<sup>1,2,3,4</sup>. In our series intestinal obstruction was a common cause of presentation of children to the emergency. The slightly lower rate noted in our series towards the higher age group is probably due to the fact that these patients are mostly managed by general surgeons locally rather than being referred to the Department of Paediatric Surgery for management.

Adhesions constitute the most common cause of obstruction. Most of the adhesions which cause obstruction are inflammatory in nature<sup>1,2,3,4</sup>. Post operative adhesions are gradually increasing in frequency. In adults, in the west, adhesions are now the commonest cause of obstruction<sup>5</sup>. The incidence of postoperative adhesions in children, though still low as compared to adults, is increasing as the quantum of trans abdominal procedures in the neonates rises<sup>6</sup>.

Meckel's diverticulum with an associated band causing obstruction was the next major cause. The mechanism of obstruction of bands ranges from external compression, entrapment of a loop of intestine to twisting of a loop around the axis of the band leading to volvulus<sup>7</sup>.

Volvulus of a loop of intestine, caused by various reasons, were the next common cause. Similar reports have been published from Africa also<sup>8,9</sup>.

Incarceration of a loop of intestine in an inguinal hernia is a common mode of presentation in the emergency<sup>10</sup>. Taxis, the first line of management in infants, has not been found to be successful in children and is thus not employed. We operate on all cases in the emergency department, reduce the gut and repair the hernia.

Intussusception, the commonest cause of intestinal obstruction in infants, is not that commonly seen in children<sup>11,12,13,14,15,16</sup>. We explore all our cases. This is quite high when compared to the western world, where an attempt at barium of air reduction is done, but a similar situation is seen in other third world countries<sup>13,14</sup>.

Congenital bands were the cause of obstruction in some cases. Various authors have reported the presence of anomalous congenital bands which do not have any apparent embryological origin<sup>13,14</sup>.

Late presentation of cases of Hirschprung's disease with acute intestinal obstruction is seen infrequently. This is due to either delay in diagnosis or mainly due to unwillingness of the parents to undergo a colostomy. With the improvement of the health care facilities this mode of presentation is on the decrease. The delay in presentation causes an increase in the morbidity as most of these patients are emaciated and malnourished. Probably this is the reason we saw most of the cases of wound dehiscence in these cases.

Ascariasis as a cause of obstruction was noted in five cases. This, as a cause, is seen not infrequently in our region as cases have been reported from Karachi and Mumbai also<sup>18,19</sup>.

Patients with congenital diaphragmatic hernia usually present soon after birth with respiratory distress. Sometime the presentation is delayed<sup>19</sup>. The presentation of these cases is usually not because of the respiratory symptoms but due to obstructive symptoms of the gut loops in the chest. This obstruction is mostly mechanical and caused by the neck of the defect. Operative reduction and repair of the defect was followed by a favourable outcome.

Incarcerated umbilical hernia was seen with the same frequency as reported elsewhere<sup>1,2,4</sup>.

The incidence of wound infection and mortality in our series were quite high but is low when compared to those reported from other third world countries<sup>1,2,3</sup>. The main reason for such high rates appears to be late presentation and malnutrition in our cases.

## CONCLUSION

Acute intestinal obstruction in children is not uncommon. It needs to be recognized and managed as soon as possible to decrease the morbidity and mortality associated with this condition.

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