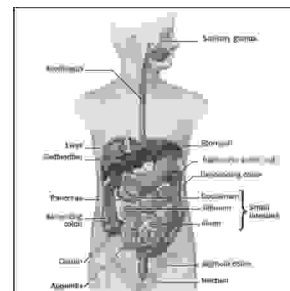


ORIGINAL

PROF-1251

INTESTINAL OBSTRUCTION;

A REVIEW OF 200 CONSECUTIVE CASES



DR. KHALID MAHMOOD
MS (Paed Surg)

Assistant Professor of Paed Surgery
Allied Hospital Punjab Medical College,
Faisalabad.

DR. SAJID HAMEED
FRCS, FCPS (Paed Surg)

Associate Professor of Paed Surgery
Allied Hospital Punjab Medical College,
Faisalabad.

DR. SHAHBAZ AHMED, FCPS

Senior Registrar of Paed Surgery
Allied Hospital Punjab Medical College,
Faisalabad.

Dr. Liaquat Ali, MBBS

Registrar of Paediatric Surgery
Allied Hospital Punjab Medical College
Faisalabad.

ABSTRACT... sajidhameed@yahoo.com. **Objective:** To identify the various causes of intestinal obstruction in infants. **Design:** Retrospective study. **Period:** July 1995 to March 2007. **Setting:** Department of Paediatric Surgery, Allied Hospital, Faisalabad. **Patients and Methods:** The record of all infants who presented with intestinal obstruction during the study period was reviewed. **Results:** Two hundred infants presented with intestinal obstruction. It was the commonest cause for admission (57%) from the emergency department and constituted 8.2% of the infants operated in the unit. They were predominantly males. Average duration of symptoms was 3 days. Common causes were intussusception (46.5%), adhesions (16%), bands (13.5%) and incarcerated inguinal hernia (8%). Wound infection (12%) and wound dehiscence (6%) were the common complications. Mortality rate was 5%. **Conclusion:** Intestinal obstruction is seen frequently in infants and is associated with significant morbidity. Early recognition and prompt treatment are needed.

Key words: Intestinal Obstruction, Intussusception, Inguinal hernia, Hirschprung's Disease

INTRODUCTION

Intestinal obstruction is a common cause for surgical admission due to acute abdominal conditions globally. Variations in the causes in different ages as well as changes in the disease pattern over the years are

documented in the literature^{1,2,3,4,5,6}. It is a potentially life threatening condition. Early recognition and prompt treatment are needed. The purpose of this study is to identify the common causes in infants 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 infants. The records of 200 patients between the ages of 1 month to 1 year admitted with a diagnosis of acute intestinal obstruction, who needed surgical intervention for its relief between July 1995 and March 2007 were reviewed. Patients who settled spontaneously on conservative management or in the case of an incarcerated inguinal hernia, after successful taxis (manual reduction) 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, a palpable mass in the abdomen and visible bowel loops were noted. Routine tests included a complete blood count, serum electrolytes and a sample for 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 accordingly. A wide bore nasogastric (NG) tube was placed and put on continuous drainage. 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 infants with acute intestinal

obstruction were managed. This constituted 8.2% of all infants operated upon and 57% of all infants admitted through the emergency. They were predominantly males (70%). Distribution of the patients according to age is given in Fig 1. The various diagnoses are listed in table I.

Table-I. List of Diagnosis		
Diagnosis	No. of pts	%age
Intussusception	93	46.5
Adhesions	32	16
Bands	27	13.5
Incarcerated Inguinal Hernia	16	8
Hirschprung's Disease	12	6
Intraluminal	9	4.5
Malrotation	3	1.5
Congenital Diaphragmatic Hernia	2	1
Incarcerated Umbilical Hernia	2	1
Duplication Cyst	2	1
Pelvic Mass	1	0.5
Anal Stenosis	1	0.5

The most frequent symptoms were vomiting (85%), constipation (70%) and abdominal pain (60%). The most common signs noted were abdominal distension (60%), blood stained mucus on rectal examination (54%) and a palpable abdominal mass (45%).

Intussusception was the commonest cause. Ninety three cases were seen during the study period. The youngest case presented at the age of 6 weeks. It was commonest between the ages of 4 to 8 months (59%). Two third of the cases were males. Three cases developed intussusception after abdominal exploration in the post operative period.

Except for one case in which hydrostatic reduction was successful all the rest were explored. Bowel resection

had to be done in 70% cases. Ostomies were fashioned in 3 cases. The ileocaecal region was involved in 86% cases.

Adhesions were the cause in 32 cases. They were inflammatory in nature in 17 and post operative in 15 cases. Acute kinks were the cause in the majority. They were the cause of volvulus of a loop of small bowel in 2 cases. Adhesolysis was done in all cases. In addition resection and anastomosis had to be done in 3 cases while ostomies were performed in 5 cases. Post operatively adhesions developed within 7 days in 3 cases. Re-exploration was done during the same admission. The majority (66.6%) presented within 3 months of the previous operation. Only 2 cases presented after 6 months. The nature of the previous operation varied in all cases.

Bands were the cause of obstruction in 27 cases. The mechanism of obstruction was compression of the bowel by the band in 14, entrapment of a loop of the intestine between the band and the mesentery in 5 and volvulus of a loop of the intestine around the band in 8 cases. Regarding the origin, they were inflammatory in 15, associated with a Meckel's diverticulum in 6 and had no apparent embryological or inflammatory origin-anomalous- in 6 cases. Release of the band was all that was needed in 9, wedge resection of the involved area in 4, resection and anastomosis in 10 and ostomies were fashioned in 4 cases.

Incarceration of a loop of intestine in an inguinal hernia is a common cause of presentation in the emergency. During the study period, out of 340 infants with inguinal hernia, 37 (10.88%) presented with incarceration. Taxis was successful in 21 (56.7%) of these. Sixteen cases were explored. Average duration of symptoms was 2 days (range 1-5 days). All were males and both sides were equally involved. The commonest age for presentation (21.6%) was 3 months. At operation incarcerated small bowel was found in 13 cases, caecum in 2 and a Richter's hernia of sigmoid colon in one. Reduction of the contents followed by high ligation of the hernial sac through an inguinal approach was possible in

10 cases. In six cases abdominal exploration had to be done also due to irreducibility and strangulation. Small bowel resection was done in 3 cases and a proximal colostomy in one.

Hirschprung's disease presented with acute intestinal obstruction in 12 cases. All had a history of delayed passage of meconium at birth. Age at presentation ranged from 1 month to 1 year (average 6 months). On exploration the cone was present at the rectosigmoid junction in 7, proximal sigmoid in 3 and at the splenic flexure in 2 cases. Serial biopsies were taken and a loop colostomy proximal to the cone was fashioned over a skin bridge in all cases.

In 9 cases the cause was intraluminal. The lesion was in ileum in 3 and in the colon in 6 cases. A stricture was found in 7 cases. These appeared to be inflammatory in nature. A duplication cyst in the caecum and severe fecal impaction were the cause in one case each. Resection and anastomosis of the involved gut was done in all but 2 cases in whom a colostomy was fashioned.

Three cases with malrotation presented with signs of high obstruction. They had a history of episodic bilious vomiting and abdominal pain. The cause was a non strangulating volvulus of the mid gut in one and obstruction of the upper small intestine by peritoneal bands in 2. Ladd's procedure was performed in all cases.

Two cases of diaphragmatic hernia presented with signs of acute intestinal obstruction. Age at presentation was 6 months and 9 months. The site of obstruction was the neck of the defect in the diaphragm. The obstruction was ileal in one and colonic in the other. The intestine was viable in both cases. Reduction of the intestine was followed by closure of the defect.

Resection and anastomosis was the commonest procedure and was performed in 90 cases. Ostomies, both ileostomy and colostomy were done in 27 cases.

Average duration of hospital stay was 6 days and ranged from 2 to 15 days. Eight cases had to be re-explored due

to an anastomotic leakage. Ostomies were fashioned in them. Superficial wound infection was noted in 12% cases. Wound dehiscence was encountered in 12 (6%) cases. Most of these (6) were after laparotomy and colostomy for Hirschprung's disease. We lost 10 (5%) patients in our series mainly due to sepsis consequent to late presentation.

DISCUSSION

Intestinal obstruction is a common cause for admission to the emergency department in all ages^{1,5,6}. In our series intestinal obstruction was the commonest (57%) cause of presentation in infants in the emergency. The slightly higher rate noted in our series is probably due to the fact that our department has a very large catchment area. Nearly all neonates and infants in this area are referred to our department for management.

Intussusception is the commonest cause of intestinal obstruction in infants in all reported series^{1,2,4}. The rate of exploration in our and other local series is quite high when compared to the western world but a similar situation is seen in other third world countries^{7,8}. We had 3 cases in which intussusception developed in the post operative period. All these cases were explored due to persistent ileus and obstructive symptoms after abdominal exploration. There was a considerable delay in deciding on exploration in these cases. The inability to diagnose the condition pre operatively and the delay in diagnosis are a feature of this condition⁹.

Adhesions constitute the next most common cause of obstruction. Most of the adhesions which cause obstruction are inflammatory in nature^{1,2,3}. In adults in the west adhesions are now the commonest cause of obstruction⁵. The incidence of postoperative adhesions in infants, though still low as compared to adults, is increasing as the quantum of trans abdominal procedures in the neonates rises^{10,11}.

Bands were a major cause. Most of these bands appeared to be inflammatory in nature. Congenital bands, remnants of the vitellointestinal duct, are usually associated with a Meckel's diverticulum¹². Various

authors have reported the presence of anomalous congenital bands which do not have any apparent embryological origin^{13,14}. 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 volvulus¹³.

Incarceration of a loop of intestine in an inguinal hernia is a common mode of presentation in the emergency^{15,16}. The reported incidence ranges from 9% to 31%. In our series 10.88% cases presented in this fashion. Taxis is the first line of management and was successful in 57% of our cases though success rates between 70% to 96% have been reported¹⁶. The difference is probably due to late presentation of our cases.

Late presentation of cases of Hirschprung's disease with acute intestinal obstruction is seen not infrequently^{2,3,4}. 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.

Cases with malrotation of the intestine usually have a dramatic presentation soon after birth and are associated with gangrene of the mid gut following volvulus. Some cases present late. These cases have a history of episodes of pain and which is bilious at times. The patient may be normal between the attacks. A contrast study of barium meal and follow through confirms the diagnosis¹⁷. Occurrence of volvulus with acute presentation is always possible.

Patients with congenital diaphragmatic hernia usually present soon after birth with respiratory distress. Sometime the presentation is delayed^{18,19}. Both of our cases presented late with signs of acute obstruction. The diagnosis was obvious on a chest X-ray. Operative reduction and repair of the defect was followed by a favourable outcome.

Other causes like incarcerated umbilical hernia, duplication cysts and others were seen with the same frequency as reported elsewhere^{1,2,4}.

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^{1,2,3}. The main reason for such high rates appears to be late presentation and malnutrition in our cases.

CONCLUSION

Acute intestinal obstruction in infants is not uncommon. It needs to be recognized and managed as soon as possible to decrease the morbidity and mortality associated with this condition. The management of intussusceptions needs to be improved by employing non operative methods of reduction. The general public and especially general practitioners need to be sensitized regarding early management of inguinal hernias. This will hopefully lead to a decrease in the incidence of incarceration with its subsequent complications.

REFERENCES

1. Adejuyigbe O, Fashakin EO. **Acute intestinal obstruction in Nigerian children.** Trop Gastroenterol, 1989 Jan-Mar;10(1):33-40.
2. Hussain I, Akhtar J, Ahmed S, Aziz A. **Intestinal obstruction in infants and older children.** J Surg Pakistan, 2002 Mar;7(1):2-6.
3. Banu T, Masood AFM. **Aetiology of intestinal obstruction in Bangladesh children.** Dhaka Shishu Hosp J, 1991 Dec;7(2):78-80.
4. Ikeda H, Matsuyama S, Suzuki N, Takahashi A, Kuroiwa M, Hatakeyama S. **Small bowel obstruction in children: review of 10 years experience.** Acta Paediatr Jpn, 1993 Dec;35(6):504-7.
5. Miller G, Boman J, Shrier I, Gordon PH. **Etiology of small bowel obstruction.** Am J Surg, 2000 Jul;180(1):33-6.
6. Ismail, Khan M, Shah A, Ali N. **Pattern of dynamic intestinal obstruction in adults.** J Postgrad Med Inst, 2005 Jun: 19(2):157-61.

7. Mansur SH, Ahmed S, Rafi M, Sheikh A. **Childhood intussusception.** Ann King Edward Med Coll, 2005; 11(3):292-4.
8. Carneiro PM, Kisusi DM. **Intussusception in children seen at Muhimbili national hospital, Dar es Salam.** East Afr Med J, 2004 Sep;81(9):439-42.
9. De Vries S, Sleeboom C, Aronson DC. **Postoperative intussusceptions in children.** Br J Surg, 1999;86:81-83.
10. Ameh EA, Nmadu PT. **Adhesion intestinal obstruction in children in northern Nigeria.** Trop Doct, 2004 Apr;34(2):104-6.
11. Choudhry MS, Grant HW. **Small bowel obstruction due to adhesions following neonatal laparotomy.** Pediatr Surg Int, 2006 Sep;(9):79-32.
12. St-Vil D, Brandt ML, Papic S, Bensoussan AL, Blanchard H. **Meckel's diverticulum in children: a 20 year review.** J Pediatr Surg, 1991 Nov;26(11):1289-92.
13. Akgur FM, Tanyel FC, Büyükpamuhçu N, Hiçsönmez A. **Anomalous congenital bands causing intestinal obstruction in children.** J Pediatr Surg, 1992 Apr;27(4): 471-73.
14. Maeda A, Yokoi S, Kunou T, Tsuboi S, Niinomi N et al. **Intestinal obstruction in the terminal ileum caused by an anomalous band between the mesoappendix and the mesentery: report of a case.** Surg Today, 2004;34(9):793-5.
15. Ameh EA. **Incarcerated and strangulated inguinal hernias in children in Zaria, Nigeria.** East Afr Med J, 1999 Sep;76(9):499-501.
16. Niedzielski J, Krol R, Gawlowska A. **Could incarceration of inguinal hernia in children be prevented?** Med Sci Monit, 2003; 9(1):CR16-18.
17. Millar AJ, Rode H, Cywes S. **Malrotation and volvulus in infancy and childhood.** Semin Pediatr Surg, 2003 Nov;12(4):229-36.
18. Numanoglu A, Steiner Z, Millar A, Cywes S. **Delayed presentation of congenital diaphragmatic hernia.** S Afr J Surg, 1997 May;35(2):74-6.
19. Ryal M, Skaba R, Lisy J, Pycha K. **Acute gastrointestinal obstruction as a late presentation of congenital diaphragmatic hernia: A report of 3 cases.** Acta Chir Belg, 2006 Jul-Aug;106(4):430-2.