

FUNCTIONAL OUTCOME OF INTESTINAL OBSTRUCTION PATIENTS REPORTED IN TERTIARY CARE HOSPITAL

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ABSTRACT

Background and Objective: Intestinal objection is a serious clinical problem presented in surgical emergency. Timely surgical intervention is essential otherwise the problem carries high morbidity and mortality. Objective of this study is to observe functional outcome in term of causes and complications in patients reported with intestinal obstruction in surgical department of Jinnah hospital, Lahore.

Methods: This descriptive case series was conducted in Jinnah Hospital, surgical unit-4 from January 2015 to January 2016, on 100 consecutive cases of intestinal obstruction. The data was entered and analyzed on computer software SPSS version 23. Frequency percentage was calculated for numerical variables (age) and for qualitative variable like sex distribution, bowel involvement, causes of intestinal obstruction, symptomatology of intestinal obstruction, duration of presentation with obstruction, treatment offered, resection Vs non-resection of bowel, postoperative complications, postoperative adhesions, associated diseases and morbidity and mortality.

Results: A total number of 100 patients presented with intestinal obstruction in the surgical emergency of Jinnah Hospital Lahore were included in this study in both genders. In our study adhesions and bands was commonest cause with 31% of patients followed by TB abdomen 23% and external hernias 18%. Other causes were colonic tumor 9%, volvulus 7%, paralytic ileus 4%, internal hernias 3% and intussusceptions 2%. Out of them 76% underwent operation and 24% relieved by conservative treatment. In 34% resection of gut was done. Most common complications were postoperative obstruction in 18%, wound infection in 17%, respiratory complications in 13%, residual abscess 13% and DVT in 2%. The mortality rate was 8%.

Conclusion: From this study it is concluded that postoperative adhesions and bands are commonest cause of intestinal obstruction followed by TB abdomen, external hernias, colonic tumors, volvulus, paralytic ileus, internal hernias and intussusceptions and that pattern of intestinal obstruction depends upon geographical factors.

Keywords: Intestinal obstruction, TB abdomen resection, adhesions volvulus, paralytic ileus intussusceptions.

INTRODUCTION

Intestinal obstruction can be defined as any type of hurdle in passage of bowel through either small or large intestine.¹ Intestinal obstruction can be of mechanical type² i.e. by some physical agent, or functional type i.e. by the paralysis of intestinal tract. Intestinal obstruction is very often presented as surgical emergency, if diagnosed and treated in time, it carries good prognosis. In patients of intestinal obstruction, proper evaluation of type of obstruction is required (whether simple or strangulated).³ High morbidity and mortality can be seen in patients of intestinal obstruction if they are presented late, could not be diagnosed or improperly resuscitated before the final surgical procedure. In order to reduce the postoperative complications proper resuscitation, rationalized diagnosis and prompt surgical intervention is needed.

Intestinal obstruction is a worldwide problem

making it one of the most common emergencies presented to the surgeons all over the world⁴. There is well defined documentation about variation at global as well as regional levels and differences in disease pattern over the course of time (years) are also evident and documented in literature. For educational purposes and medical learning periodic study about these changes in disease pattern from time to time is necessary. In this region of the world pattern of the disease is quite different from the other parts of the world. In developing countries like ours most common cause of intestinal obstruction is strangulated hernias⁵. On the other hand in developed countries the leading causes of this disease are malignant tumors⁶ and postoperative adhesions.

Because of fast changing disease pattern postoperative adhesions are commonest cause of intestinal obstruction after hernias in developing world.⁷ In

Pakistan, despite the advances in prophylactic therapy and diagnostics, Tuberculosis still is a major health concern and is leading cause of intestinal obstruction in our setup.⁸ Moreover disease pattern not only varies from country to country but also from one geographical area to the other in the same country, reason being the different causal factors of different regions. That is why time to time study of the incidence and pattern of this disease is very important so that focus can be put on the emergence of new entities and issues and their proper management.

METHODS

This descriptive case series was conducted in Jinnah Hospital, surgical unit-4 from January 2015 to 2016, on 100 consecutive cases of intestinal obstruction, presenting in the emergency of Jinnah Hospital, Lahore. All the cases of age more than 10 years and of either sex were included in this study. Paediatric group patients were referred to paediatric surgery unit. Informed consent was taken from every patient included in the study. All patients admitted were either put on conservative treatment or operation was performed in cases having chances of strangulation and gangrene of gut.

Investigations done were complete blood examination and ESR, urine examination, blood sugar, serum urea and creatinine, serum electrolyte, chest x-ray, x-ray abdomen, ECG in old patients and ultrasonography. Full systemic examination preceded each investigation. Rectal examination was done as a mandatory procedure in every patient. All cases which were kept on conservative treatment were given parenteral fluids, kept NPO till bowel sounds returned or flatus passed. Parenteral antibiotics given include injection Ampicillin 500mg parenteral 6 hourly, injection gentamicin parenteral 80mg 8hourly, injection flagyl 500mg parenteral 8 hourly in adult cases and doses adjusted according to weight for younger patients. When surgery was performed within first 24 hours of admission it was regarded urgent and those operated after 24 hours post admission were said to be semi urgent. Accuracy of diagnosis was assessed during laparotomy and all operative details were noted.

Midline laparotomy incision was made in every case of intestinal obstruction except in cases of obstructed inguinal hernias where supra inguinal skin crease incision was made. Peritoneum was opened in the midline and in cases of incisional hernia it was opened in the area away from old scar. In all these cases caecum was first located and seen whether it is collapsed or not, if collapsed then searched proximally for small intestine and vice versa for large gut if it is distended. The cause of obstruction was noted and relieved. Adh- enolysis was done for adhesions, excision of bands for band like adhesions, excision of obstructed Meckel's diverticulum, de-rotation of volvulus, resection and

anastomosis of gangrenous gut, Copes's method of resection of intussusceptions, Hartman's procedure for large gut malignancy and ileostomy and colostomy for small and large gut obstruction respectively. Resection of gut depended upon viability of the gut, if the gut was viable then noted problem was treated without resecting the gut but if the gut was unviable because of gangrene or other reasons, it was subjected to resection. Resection and anastomosis was done in two layers, inner continuous and outer Lambert's with vicryl 2/0. Large gut anastomosis was however covered with proximal loop colostomy for six weeks. All cases of resection or sepsis were subjected to drainage preferably one drain in pelvis and one near the site of anastomosis. In cases of obstructed hernias Mayo's repair was done in Para-umbilical and incisional hernia and Darning and Bassini done in inguinal hernia. Postoperative follow-up was done in keeping patients NPO and given fluids till the return of bowel sounds. Antibiotic was given 5 days in every case and removal of stitches after 7 – 10 days. Analysis of postoperative complications was done by periodic visits after one month, 3 month, 6 month, 1 year and 2 year after discharge.

If patient developed fever more than 100° on 1st postoperative day with clinical evidence of collapse of lung, it was regarded as atelectasis. Evidence of cellulitis around wound, development of seroma was regarded as wound infection, while discharge of pus with cellulitis was labeled as wound abscess. Opening of laparotomy wound on 10th day was said to be wound dehiscence. Ultrasonography confirmed fluid collection of more than 250cc in pelvis, sub hepatic, sub phrenic or paracolic gutters with increased body temperature was regarded as residual abscess. Discharge of fecal matter either from drain site or from wound was regarded as postoperative fistula. Recurrent obstruction was taken as criteria of management and any patient with radiographic and clinical evidence of intestinal obstruction presenting within 6 months of first presentation were regarded as recurrent intestinal obstruction. Postoperative mortality was defined as death within 30 days and morbidity in terms of duration of hospital stay.

Exclusion criteria for this study was, all patients with renal failure, all patients with generalized metabolic disease, patients with septicemia shock, patients on immunosuppressive therapy and patients with known cardiopulmonary disease. Inclusion criteria was, all patients with age more than 10 years presenting in surgical emergency with intestinal obstruction and patients presenting in the surgical emergency with obstructed hernias.

RESULTS

Total 100 patients were treated for intestinal obstruction during the study period.

Sex and Age Distribution

There were 62 males and 32 females (68% & 32% respectively) (table 1). The age ranged from 10 years to 80 years. Larger number of patients were from 3rd decade (30 out of hundred) 30%, followed by 4th and 2nd decade with 16% and 15% respectively (table 1).

Table 1: Age of Patients.

| Age | No. of Patients | Percentage |
|------------------------|-----------------|------------|
| 2 nd Decade | 15 | 15% |
| 3 rd Decade | 30 | 30% |
| 4 th Decade | 16 | 16% |
| 5 th Decade | 11 | 11% |
| 6 th Decade | 12 | 12% |
| 7 th Decade | 13 | 13% |
| 8 th Decade | 3 | 3% |
| Total | 100 | 100% |

Bowel Involvement

Out of hundred patients small bowel was involved in 78 patients (78%) while large bowel was involved in 22 patients (22%) (table 2).

Table 2: Sex Distribution.

| Sex | No. of Patients | Percentage |
|---|-----------------|------------|
| Male | 68 | 68% |
| Female | 32 | 32% |
| Total | 100 | 100.0 |
| <i>Bowel Involvement</i> | | |
| Bowel | No. of Patients | Percentage |
| Small | 78 | 78% |
| Large | 22 | 22% |
| Total | 100 | 100.0 |
| <i>Causes of Intestinal Obstruction</i> | | |
| Causes | No. of Patients | Percentage |
| Adhesion, Bands and Meckel's Diverticulum | 31 | 31% |
| TB Abdomen | 23 | 23% |
| External Hernias | 18 | 18% |
| Colonic Tumors | 09 | 9% |
| Volvulus | 07 | 7% |

| | | |
|------------------|-----|-------|
| Paralytic Ileus | 04 | 4% |
| Internal Hernias | 03 | 3% |
| Intussusception | 02 | 2% |
| Total | 100 | 100.0 |

Etiology

The etiological factors involved were adhesion and bands in 31 patients (31%), TB abdomen in 23 patients (23%), external hernia in 18 patients (18%), colonic tumors in 9 patients (9%), volvulus in 7 patients (7%), paralytic ileus in 4 patients (4%), internal hernias in 3 patients (3%) and intussusceptions in 2 patients (2%) (table 2).

Adhesions, TB abdomen and hernias collectively comprise almost 72% of cases.

Adhesions and bands represent the most common cause of intestinal obstruction in this study. There are 31 cases of adhesive intestinal obstruction. In all cases x-ray abdomen in erect and supine posture were taken which revealed dilated loops with multiple air filled levels and on behalf of these x-rays, history and clinical examination, a provisional diagnosis of intestinal obstruction was made.

Out of 31 patients of adhesive group there were 21 males and 10 females. Four cases (12.9%) were of bands of Meckel's diverticulum causing small bowel obstruction. All patients of Meckel's diverticulum were male, age ranging up to 68 years. In single case there was gangrenous Meckel's diverticulum and segmental resection with end to end anastomosis was performed and in remaining all cases Meckel's resection was performed in non-gangrenous Meckel's diverticulum due to its broad base. In the rest 27 cases, primary adhesions were 7 cases and 20 cases were of postoperative adhesions. Out of which 12 were male and 8 were female patients. The type of operation preceding the acute intestinal obstructions are shown in table 5. In this study there were 20 patients with postoperative adhesions, most common after appendectomy and gynecological procedure, 10 (50%) and 6 (30%) respectively. There were 4 patients who presented with postoperative adhesions after colorectal surgery for malignancy and 4 patients after previous pelvic collection. In the adhesive group the male sex is more involved than females. All the patients of acute intestinal obstruction, in the absence of strangulation were kept on conservative trial in the initial 48 hours. There were 2 deaths in this group due to respiratory complications.

The other most common cause of intestinal obstruction was abdominal tuberculosis. In our study 23% patients belonged to this group and 13 were female while 10 were male. Seventeen cases out of 23 had stricture and resection of stricture with anastomosis was done. Out of 23, 6 patients presented with abdominal

mass mostly in ileocolic regin. There were 2 deaths in this group.

In this study, cases of external hernias were 18. Out of these 16 were male and only 2 females, 13 patients with inguinal hernia, 3 patients with para umbilical hernia and 2 patients with incisional hernias. In only 4 cases resection and anastomosis was done, in all other cases only the gut was reduced back to abdomen and hernial orifice repaired as gut was viable in these cases. There were no deaths in this group.

Malignancy in this study stood responsible for 9 patients (9%), 5 patients were female and 4 were male. All patients were above 50 years of age. In 8 cases there is a large gut tumor and in one case small bowel tumor. Only in 7 cases these tumors were resectable and in 2 cases it was not resectable. There were 2 deaths in this group.

In this study volvulus was cause of intestinal obstruction in 7 cases. Out of 7, 4 were male and 3 were female. In 5 out of 7 cases the volvulus involved the large gut and in remaining 2 cases the small bowel was involved. The sigmoid colon was most commonly involved (4 out of 5). In all cases sigmoid colon volvulus, resection anastomosis was done as gut was not viable and in 1 case caecum was involved in which caecostomy and caecopexy was performed. Two cases were of small intestine volvulus due to the band extending from tip of appendix up to the terminal ileum. Just excision of bands was performed. There were 2 deaths in this group and one was due to septicemia and other was due to respiratory complication developed on 1st postoperative day.

There were 4 cases of paralytic ileus in this study, 3 of which treated conservatively and in one case laprotomy with bowel decompenation was done.

In this study, there were 3 cases of internal hernias. In all the cases internal hernia laprotomy was done and gut was examined. In one case gut was gangrenous and resection anastomosis was done. In other two cases gut was viable and gut was freed and defect was repaired.

In this study, intussusceptions was cause of intestinal obstruction in 2 cases (2%). One was female and the other was male. In both cases conservative treatment failed and patient then treated surgically. In one of them operative reduction by Coop’s method was done successfully and in the other case resection and anastomosis in the form of extended right hemicolectomy was done. Both were ileocaecal type of variety. There was loop present in both cases.

Clinical Presentation

All patients presented with pain, vomiting and constipation and distension (table 3). Most of the patients presented with signs and symptoms 80% and 20% presented within 6 hours of abdominal symptoms of intestinal obstruction (table 3). Dehydration was present

in majority of the cases. Twenty patients had one or the other associated disease. Out of them 10 patients had diabetes mellitus, 6 had respiratory disease and 4 with ischemic heart disease (table 5)

Table 3: Symptomatology of Intestinal Obstruction.

| Symptom | No. of Patients | Percentage |
|---|-----------------|------------|
| Abdominal Pain | 100 | 100% |
| Vomiting | 84 | 84% |
| Constipation | 76 | 76% |
| Distension | 78 | 78% |
| Swelling in Inguinal Region | 18 | 18% |
| Abdominal Swelling | 4 | 04% |
| Total | 100 | 100.0 |
| <i>Treatment Offered</i> | | |
| Treatment | No. of Patients | Percentage |
| Conservative | 24 | 24% |
| Operative | 76 | 76% |
| Total | 100 | 100.0 |
| <i>Duration of Presentation with Intestinal Obstruction</i> | | |
| After 6 Hours of Symptoms | | 80% |
| Within 6 Hours of Symptoms | | 20% |

Treatment Offered

In 100 cases included in the study, 24 cases had conservative treatment and 76 patients had operative treatment (table 3). Out of which 26 patients had resection and re-anastomosis of the gut. Out of 26 cases 18 cases had resection due to gangrene of gut and other 10 cases had resection due to other causes like strictures (table 4).

Table 4: Resection of Bowel Vs Non-Resection.

| Procedure | No. of Cases | Percentage |
|------------------------------------|-----------------|------------|
| Non-Resection | 50 | 50% |
| Resection Of GUT | 26 | 26% |
| > Gangrenous | 18 | 18% |
| > Non-Gangrenous | 8 | 8% |
| <i>Postoperative Complications</i> | | |
| Complication | No. of Patients | Percentage |
| Postoperative Obstruction | 14 | 14% |

| | | |
|--------------------------|----|-----|
| Wound Infection | 13 | 13% |
| Residual Abscess | 10 | 10% |
| Respiratory Complication | 10 | 10% |
| Enterocutaneous Fistulae | 3 | 3% |
| Anastomotic Leakage | 2 | 2% |
| DVT | 1 | 1% |
| Others | 2 | 2% |

Postoperative Complications

Most common complications were postoperative obstruction (18%) due to adhesions and wound infections. Respiratory complications were seen in 13% cases out of which 4 patients died. Other complications include residual abscess in 10 patients, enterocutaneous fistulae in 3 patients, anastomotic leakage in 2 patients, DVT in 2 patients and others in 2 patients (table 4).

Table 5: Postoperative Adhesions (20 Patients Out of 100).

| Operation | No. of Patients | Percentage |
|--|-----------------|------------|
| Appendicectomy | 10 | 50% |
| Malignancy | 4 | 20% |
| Pelvic Collection | 4 | 20% |
| Cesarean Section | 2 | 10% |
| <i>Associated Diseases in Cases of Small Bowel Obstruction (20 Cases Out of 100)</i> | | |
| Associated Disease | No. of Patients | Percentage |
| Diabetes Mellitus | 10 | 10% |
| Respiratory Diseases | 6 | 6% |
| Ischemic Heart Disease | 4 | 4% |
| Total | 20 | 20% |
| <i>Outcome of Intestinal Obstruction</i> | | |
| Morbidity | | 47% |
| Mortality | | 8% |

Follow-up

Most of the patients in our study were uneducated, came from rural areas of the country and therefore did not report for follow-up. Patients' compliance in this regard remained poor. Pain operative scar was main complaint of the most of the patients. The transient abdominal distension with colic was also noticed in whom resection of gut was performed.

Morbidity and Mortality

In this study, morbidity in term of hospital stay remained directly related to late presentation of the cases. Overall hospital stay remained prolonged in cases of adhesive intestinal obstruction, having late presentation and in patients having associated medical illness. The longest hospital stay in our study was 40 days in a case of postoperative adhesive intestinal obstruction. The average hospital stay is 8.5 days.

Mortality rate in our study was 8%. There were 2 deaths in cases of adhesive small intestinal obstruction, 2 in tuberculosis obstruction, 2 in malignant obstruction and 2 in volvulus of intestine. Most deaths were due to respiratory infection, DVT and septicemia.

DISCUSSION

The study focuses on the variable clinical pattern of the disease in comparison to other studies so that fluctuating pattern of intestinal obstruction can be evaluated. Most patients were of age 20 – 30 years i.e. 3rd decade, with average age coming almost equal to that reported by Soukati-EO.⁹

Male predominance with male to female ratio of 2:1 relates to many other studies. Due to gynecological causes of intestinal obstruction Adesunkanmi's study¹⁰ gives adhesions as the main cause of obstruction. All types of intestinal obstructions are more common in males than females other than those caused by gallstones.¹¹ Small intestine is most involved part of gut to get involved. It is evident in all of the similar studies.

As far as the presentation of the disease is concerned, abdominal pain, distension, nausea and constipation were important symptoms and findings with which patients presented.¹²

Unfortunately diagnostic issues increased with the inventions of radiography and sonography, which later increased more by CT scan and MRI. The study showed that specificity and sensitivity of both sonography and radiography¹³ in our study are similar to other studies whereas the etiological factors varied with varying geographical region and disease patterns. It is quite clear that pattern of intestinal obstruction in this area is different from those studied in other cities of Pakistan¹⁴⁻¹⁸ but very different from the studies done in developed world. In our study 31% cases were because of postoperative adhesion, proving again that it is the most common cause of intestinal obstruction. In our list postoperative adhesion are mostly seen in gynecological operations¹⁹ and appendicectomy.²⁰ Dai handling, sepsis and pelvic instrumentation may be the causes.

Postoperative adhesions were most common cause (44%) of intestinal obstruction demonstrated by as study in Fuzum²¹ followed by strangulated hernia (23.9%), similarly in another study by Mucha²² postoperative adhesions were 49%, malignancy 16.2 and hernia 15% while in another study in Khartoum⁹ her-

nia was the most common cause. There is another study conducted on the same population as in Saudi Arabian study with percentage of 20% versus 18%.

Tuberculosis is the second most common cause of intestinal obstruction with 23% and it is consistent in most of the studies conducted in Pakistan.^{14,18} Tuberculosis remains the major health problem in developing countries like Pakistan and India²³ despite advances in diagnostic facilities and prophylactic drug therapy. Reason for consistent problem can be stated as poor hygiene, emergence of AIDS, drug resistance and changing disease pattern.

Another common cause of intestinal obstruction is colonic malignancy²⁴ as 9% of the patients included in this study were suffering from colonic malignancy. In Sudanese study 4% patients with intestinal obstruction were diagnosed with colonic tumor and indicated late presentation, increased incidence of the tumor and lesser consultation. Intestinal obstruction of large bowel is most commonly caused by colonic tumor.

In our population with increased incidence of idiopathic constipation and unhygienic dietary habits, intestinal volvulus is becoming another major cause of intestinal obstruction.²⁵ It is found to be more common and well documented in literature in Afghan refugees.²⁶

Treatment of obstruction in intestine is always based upon absence or presence of strangulations. Management of intestinal obstruction has been better since the invention of modern modalities and only few cases were seen to be abandoning the conservative type of treatment. Conservative treatment only suited to the patients having tuberculosis adhesions and paralytic ileus with few other cases of concurrent adhesions. In this study 38% patients were treated by resection and anastomosis while 75 cases by adhenolysis. Late presentation and mismanagements by quacks resulted in more operative treatment than conservative treatment in our setup as compared to the studies conducted in Sudan and Saudi Arabia.

Recent emergence of laparoscopy has revolutionized the effective treatment of acute intestinal obstruction.²⁷ As a result laparoscopy has rapidly replaced the older and traditional ways of treatment of intestinal obstruction.²⁸ Although reoperation rate may be higher²⁹ but postoperative stay and mortality has reduced to considerable extent. Increased morbidity and mortality is associated with old age, late presentation of more than 24 hours, nonviable strangulations and co-morbidity.³⁰ Mortality calculated in our study i.e. 8% was less than that in local studies but slightly more than those studied in developed countries³¹, which shows timely diagnosis, better surgical techniques and proper postoperative care. Similarly it also resulted in decreased postoperative stay and overall patient morbidity.

From this study we made a **conclusion** that post-

operative adhesions and bands are commonest cause of intestinal obstruction followed by TB abdomen, external hernias, colonic tumors, volvulus, paralytic ileus, internal hernias and intussusceptions and that pattern of intestinal obstruction depends upon geographical factors.

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Authors' Contribution

AM: Data collection, literature search, materials and methods, result writing, contributed to discussion writing. AA: Conceived the idea, contributed in literature search, materials and methods, result and discussion writing. HH: Contributed in literature search, writing results based on analysis. SHC: Analysis of data reviewed the article and gave expert opinion.

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