

A Study on Treatment Modalities of Acute Intestinal Obstruction

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Abstract

Introduction: Postoperative adhesions are the most common cause of mechanical SBO, which cause extrinsic compression of the intestine. Malignant tumors or strictures of the small bowel can cause intrinsic blockage and are the second leading cause of SBO. Hernias cause extrinsic compression and are the third most common cause of SBO. *Methodology:* All patients are subjected to required preoperative biochemical investigations. Plain X-ray erect abdomen was carried out in almost all patients except in obstructed inguinal hernias. Ultrasonography of abdomen was done in some cases whose diagnosis by X-ray was inconclusive. *Results:* Release of adhesions and bands was done in 22 cases. Resection and end-to-end anastomosis was done in 16 cases, which included cases of intussusception, adhesions, stricture, ileocaecal growth, colonic growth. In cases of hernia with strangulation and gangrene of bowel; resection and repair of hernia was done depending upon the type i.e., Bassini's repair in inguinal, Lotheissen operation in femoral hernia. *Conclusion:* Morbidity was due to anastomotic leak, wound infection, chest infection and wound dehiscence.

Keywords: Postoperative Adhesions; Acute Intestinal Obstruction; Bassini's Repair.

Introduction

Irrespective of aetiology or acuteness of onset, in dynamic (mechanical) obstruction the proximal bowel dilates and develops an altered motility. Below the obstruction the bowel exhibits normal peristalsis and absorption until it becomes empty, at which point it contracts and becomes immobile. Initially, proximal peristalsis is increased to overcome the obstruction, in direct proportion to the distance of the obstruction. If the obstruction is not relieved, the bowel begins to dilate, causing a reduction in peristaltic strength, ultimately resulting in flaccidity and paralysis. This is a protective phenomenon to prevent vascular damage secondary to increased intraluminal pressure.

The distension proximal to an obstruction is produced by two factors:

Gas: There is a significant overgrowth of both aerobic and anaerobic organisms, resulting in considerable gas production. Following the reabsorption of oxygen and carbon dioxide, the majority is made up of nitrogen (90%) and hydrogen sulphide.

Fluid: This is made up of the various digestive juices. Following obstruction, fluid accumulates within the bowel wall and any excess is secreted into the lumen, whilst absorption from the gut is retarded.

Dehydration and electrolyte loss are therefore due to:

- Reduced oral intake;
- Defective intestinal absorption;
- Losses as a result of vomiting;

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- Sequestration in the bowel lumen.

When strangulation occurs, the viability of the bowel is threatened secondary to a compromised blood supply. The venous return is compromised before the arterial supply. The resultant increase in capillary pressure leads to local mural distension with loss of intravascular fluid and red blood cells intramurally and extraluminally. Once the arterial supply is impaired, haemorrhagic infarction occurs. As the viability of the bowel is compromised there is marked translocation and systemic exposure to anaerobic organisms with their associated toxins. The morbidity of intraperitoneal strangulation is far greater than with an external hernia, which has a smaller absorptive surface.

The morbidity and mortality associated with strangulation are dependent on age and extent. In strangulated external hernias, the segment involved is short and the resultant blood and fluid loss is small. When bowel involvement is extensive, the loss of blood and circulatory volume will cause peripheral circulatory failure.

This occurs, when the bowel is obstructed at both the proximal and distal points. Usually present in many cases of intestinal strangulation. Unlike cases of non-strangulating obstruction, there is no early distension of the proximal intestine. When gangrene of the strangulated segment is imminent, retrograde thrombosis of the mesenteric veins results in distension on both sides of the strangulated segment.

A classic form of closed-loop obstruction is seen in the presence of a malignant stricture of the right colon with a competent Ileo-caecal valve (present in up to one-third of individuals). The inability of the distended colon to decompress itself into the small bowel results in an increase in luminal pressure, which is greatest at the caecum, with subsequent impairment of blood supply. If obstruction is unrelieved, the end result is necrosis and perforation.

Postoperative adhesions are the most common cause of mechanical SBO, which cause extrinsic compression of the intestine. Malignant tumors or strictures of the small bowel can cause intrinsic blockage and are the second leading cause of SBO. Hernias cause extrinsic compression and are the third most common cause of SBO [29]. Adhesion is classified into (1) congenital (2) acquired.

Congenital adhesions rarely gives rise to acute intestinal obstruction, adhesions which give rise to acute intestinal obstruction are acquired most of the time and are due to (1) Postoperative adhesions, (2) Post-inflammatory adhesions due to intra-peritoneal infections. Foreign material, post irradiation, and

certain drugs (protocol) can also cause adhesions [30]. Postoperative adhesions commonly occur following colonic and pelvic surgeries. Ileum is the commonest segment to be obstructed due to adhesions. About 5% of abdominal surgeries subsequently develop obstruction due to adhesions. Operation in the colon carry high incidence of obstruction 10-20%. About 20% of the obstruction occurs in the first year after laparotomy and majority of these occur during first few weeks after surgery and termed as early postoperative obstructions and most resolved by conservative treatment [31]. Remaining 50% are cases occur during first few months after surgery, which are considered as late adhesive obstruction. Any source of peritoneal irritation results in local fibrin production, which provides adhesion between adjacent surface, early fibrinous adhesions may disappear when the cause is removed, or they become vascularized and replace by mature fibrous bands.

Methodology

This was a prospective study of 50 cases presenting with symptoms and signs suggestive of acute intestinal obstruction. A detailed structured Proforma was used to collect this information. All data was entered on master chart for analysis.

All patients are subjected to required preoperative biochemical investigations. Plain X-ray erect abdomen was carried out in almost all patients except in obstructed inguinal hernias. Ultrasonography of abdomen was done in some cases whose diagnosis by X-ray was inconclusive. Patients who showed reduction in abdominal distention and improvement in general condition especially in individuals with postoperative adhesions, a chance of conservative management was taken (by extending the supportive treatment) for further 12 to 24 hours; those who showed improvement by moving bowels, reduction in pain & tenderness was decided for conservative treatment, such individuals were excluded in this study. Patients with clear-cut signs and symptoms of acute obstruction were managed by appropriate surgical procedure after resuscitation. The nature of obstruction and the cause of obstruction were noted at laparotomy. A detailed structured Proforma was used to collect this information. All data was entered on master chart for analysis.

Results

Plain X-ray erect abdomen was done in 44 cases

out of 50 cases and all 44 cases showed multiple air fluid levels.

Release of adhesions and bands was done in 22 cases. Resection and end-to-end anastomosis was done in 16 cases, which included cases of intussusception, adhesions, stricture, ileocaecal growth, colonic growth. In cases of hernia with strangulation and gangrene of bowel; resection and repair of hernia was done depending upon the type i.e., Bassini's repair in inguinal, Lotheissen operation in femoral hernia.

In 8 of our patients wound infection was present,

ranging from stitch abscess to superficial gaping. 1 case of mesenteric ischemia developed Short bowel syndrome which was managed with parenteral nutritional support. Enterocutaneous fistula developed in 2 cases; one case re-exploration and resection of unhealthy segment and re-anastomosis was done after 6 weeks and for second case of mesenteric ischemia fistula closure occurred spontaneously following conservative management for 4 wks. Wound dehiscence in 2 cases managed with tension sutures. 3 patients had septicaemia and died.

Table 1: Types of operation

| Types of Operation | Number of Patient (n=50) | Percentage |
|--|--------------------------|------------|
| Release of adhesions and bands | 22 | 44 |
| Resection and end-to-end anastomosis | 13 | 26 |
| Untwisting of volvulus with colostomy | 2 | 4 |
| Herniorrhaphy | 6 | 12 |
| Resection & anastomosis with Herniorrhaphy | 3 | 6 |
| Hemicolectomy | 2 | 4 |
| Ileo-transverse anastomosis | 1 | 2 |

Table 2: Postoperative complications

| Postoperative Complications | Number of Patients (n=50) | Percentage |
|-----------------------------|---------------------------|------------|
| Wound infection | 8 | 16 |
| Short bowel syndrome | 1 | 2 |
| Enterocutaneous fistula | 2 | 4 |
| Wound Dehiscence | 2 | 4 |
| Deaths (Septicaemia) | 3 | 6 |

Table 3: Mortality comparison with other world series

| Author Year | No. of Cases Studied | Mortality % |
|--------------------------------------|----------------------|-------------|
| Wangensteen ¹⁹⁵⁵ | 252 | 11.0 |
| Gill and Eggleston ¹⁷¹⁹⁶⁵ | 147 | 16.0 |
| C. S. Ramachandran ⁶⁷¹⁹⁸² | 417 | 12.7 |
| Cheadle et al ⁷³¹⁹⁹⁸ | 300 | 9.0 |
| Present study 2011 | 50 | 6 |

Discussion

All the cases of our study were subjected to surgery. Most common operation performed was release of adhesions and bands; was done in 44% of cases. Resection and anastomosis of bowel was done in 26% cases, Hemicolectomy in 6% cases, reduction and hernia repair in 12% cases. Resection & anastomosis with herniorrhaphy was done in 6% cases. Untwisting of Volvulus in 4% of cases and Ileo-transverse anastomosis in 2% of cases. Postoperatively IV fluids and nasogastric decompression and antibiotics were given till the good bowel movements appeared. The factors that limit

adhesions formation are good surgical technique, washing of the peritoneal cavity with saline to remove clots and debris, minimal contact with gauze, covering the anastomotic and raw peritoneal surface with omentum.

3 cases (6%) died following surgery for acute intestinal obstruction. Among those patients who died the precipitating causes was-

1. Obstructed inguinal hernia - 1
2. Growth in the rectum - 1
3. Sigmoid volvulus -1

In our study we had mortality rate of 6%. The decrease in overall mortality is due to better

understanding of pathophysiology of obstruction, improvement in resuscitative and supportive treatment, aggressive surgical therapy in combination with improved technique in anaesthesia.

The mortality in intestinal obstruction is high in individuals who develop strangulation and gangrene of the bowel, those present beyond 72 hours and in those having pre-existing associated diseases and elderly people, though early treatment can reduce the mortality, advanced age and associated metabolic, cardiopulmonary diseases, still leads to high rate of mortality. Hence the predisposing causes like hernia should be promptly attempted early in elderly individuals before they go for complication. So, it is quite evident that the duration of symptoms, age, general condition of the patient and associated diseases and operative procedures adopted has a definite role on the prognosis and mortality.

Conclusion

Prognosis was poor in elderly patients and newborns, in patients with co-morbid conditions, presence of strangulated bowel that required resection & anastomosis and those whose presentation to hospital was late.

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