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Evaluation of Tuberculosis as an AetiologicalFactor in the Setting of Acute Intestinal Obstruction

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Background:
This prospective study is to know the incidence of tuberculosis in acute intestinal obstructionand to analyze the modalities of operative management and post-operative complications.
Methods:
This is a prospective study of fifty cases of acute intestinal obstruction that presented to emergency department of Mediciti General Hospital,Ghanpur between August 2018 &March 2020 were studied.
Results:
In this study of 50 patients,mean age was 35 years, male to female ratio was 2.6:1 and small bowel obstructions (41) outnumbered large bowel obstruction (9) with Tubercular Strictures accounted for 4% of all cases and most common operative procedure done was resection &anastomosis (28%),followed by adhesiolysis (22%).
Conclusion:
Tuberculous bowel obstruction remains rampant in our environment and contributes significantly to high morbidity and mortality. Tubercular stricture contributed 4% of all cases.

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I. Introduction

Acute intestinal obstruction is one of the commonest surgical emergencies in all age groups. It is defined as obstruction in forward propulsion of the contents due to mechanical or neurological causes. Mode of presentation is same in all but underlying cause varies in each age group. Now with better understanding of pathophysiology, improvement in radiological techniques of diagnosis and high degree of refinement in correction of fluid and electrolyte imbalance, introduction of antibiotics to effective bacteriological control, introduction of techniques in gastrointestinal decompression, new surgical principles, as in large bowel obstruction introduction of on table lavage and resection and primary anastomosis has replaced staged procedures and number of days in hospital stay. Improvement in field of anesthesia has all contributed to lowering the morbidity and mortality. The dictum of never let the sun set or rise in small bowel obstruction has made early surgical intervention for intestinal obstruction[1]. This in turn has reduced the incidence of strangulation of bowel, which was major cause of mortality in already ill patient. Success in treatment of patient with acute intestinal obstruction depends largely upon early diagnosis, skillful management and appreciation of importance of treating the pathological effects of obstruction just as much as the cause itself.

II. Aims And Objectives

To study the incidence of tuberculosis inacute intestinal obstruction.
To analyze the modalities of operative management and post operative complications.

III. Materials & Methods

Fifty cases of acute intestinal obstruction that presented to emergency department of Mediciti General Hospital ,Ghanpur between August 2018 & march 2020 were studied.

Inclusion Criteria:

1. Patients of all age groups who attended OPD and emergency department at, Mediciti General Hospital, Ghanpurwith history and clinical picture suggestive of acute intestinal obstruction.
2. Patients who had hernia with recent onset of irreducibility, pain,vomiting and constipation.

3. Intestinal obstruction due to tuberculous etiology is included only on confirmation by histopathology of the lesion.

Exclusion Criteria:
Patients with history of sub-acute intestinal obstruction wereexcluded from this study.

- All patients with provisional diagnosis of acute intestinal obstruction were assessed clinically in detail as proforma after admission.
- Investigations done included Hb, Blood counts including TC, DC, ESR, X-ray Chest PA view, Plain X-ray abdomen erect film & Ultrasonography abdomen.
- Serum electrolytes were carried out in required cases only.
- All patients were subjected to surgery with objective to relieve the obstruction.

IV. Observation And Results

- A clinical study of 50 cases of acute intestinal obstruction were studied duringperiod of August 2018– March 2020 at Mediciti General Hospital,Ghanpur. Analysis is as follows:

1. AGE DISTRIBUTION

- The study was done in all age groups ranging from new born to 85yrs
- with a mean age of 35 years.

AGE	TOTAL CASES
0-10	12
11-20	04
21-30	07
31-40	05
41-50	09
51-60	03
61-70	04
71-80	04
81-90	02
Total	**50**

Table: Age Distribution

2. SEX INCIDENCE

Acute intestinal obstruction was commoner in males (72%) than females (28%). Male to female ratio was 2.6:1

AGE	MALE	FEMALE
0-10	9	3
11-20	1	3
21-30	6	1
31-40	5	0
41-50	7	2
51-60	2	1
61-70	3	1
71-80	2	2
81-90	1	1
Total	**36**	**14**

Table: Sex Incidence

3. MODE OF PRESENTATION & LEVELS OF OBSTRUCTION

Small bowel obstructions (41) outnumbered large bowel obstruction (9).

LEVELS OF OBSTRUCTION

SMALL BOWEL	LARGE BOWEL
41	09

High small bowel obstruction: 10 cases
Low small bowel obstruction: 31 cases
Large bowel obstruction: 09 cases

4. ANALYSIS OF SYMPTOMS & SIGNS

SL. NO.	SYMPTOMS & SIGNS	NO. OF CASES	PERCENTAGE
1.	Pain Abdomen	39	78
2.	Vomiting	35	70
3.	Tenderness	43	86
4.	Abdominal Distension	29	58
5.	Constipation	26	52
6.	Increased Bowel Sounds	18	36
7.	Decreased Bowel Sounds	10	20
8.	Absent Bowel Sounds	07	14
9.	Groin Swelling	09	18
10.	Visible Peristalsis	08	16
11.	Guarding	21	42
12.	Rigidity	02	04
13.	Palpable Mass	–	–
14.	Significant PR Findings	01	02

Table: Analysis of symptoms and signs and their percentage.

Duration of Pain
Most patients presented with pain lasting more than 2day duration.

Duration	No. of patients	Percentage
0-24 hrs	16	32
2-10 days	23	46

Previous history of pain
Duration of previous history of pain lasted from 4-7 months.

5. ETIOLOGY & INTRAOPERATIVE FINDINGS IN OBSTRUCTION

Small bowel adhesions were the commonest cause of acute intestinal obstruction. Tubercular Strictures accounted for 4% of all cases.

SMALL BOWEL OBSTRUCTION - 41 cases (82%)

CAUSES	CASES	PERCENTAGE
Adhesions	13	26
Obstructed Hernias	09	18
Small bowel volvulus	07	14
Bands	06	12
TB Stricture	02	04
Intussussception	02	04
Meckel's Diverticulum	01	02
Meconium Ileus	01	02

LARGE BOWEL OBSTRUCTION – 9 cases (18%)

CAUSES	CASES	PERCENTAGE
Neoplasms	3	6
Hirschprung's	3	6
Volvulus	2	4
Intussussception	1	2

6. RADIOLOGICAL FEATURES

Plain X-ray erect abdomen was done in 39 cases out of 50 cases.
Positive interpretation was when it correlated with exact site of pathology and negative when it did not.

Findings	No. of cases	Percentage
Multiple Air Fluid Levels	28	56
Volvulus	09	18
Pneumoperitoneum	00	00
Total	**37**	**74**

7. STRANGULATION & CAUSES

The incidence of strangulation was seen in up to 30% patients (15).

CAUSES	CASES
Volvulus	6
Hernias	4
Adhesions	2
Others	3

8. **MANAGEMENT**

Most common operative procedure done was resection &anastomosis (28%), followed by adhesiolysis (22%).

SMALL BOWEL OBSTRUCTION -41 cases

CAUSES	CASES
Adhesiolysis	11
Resection & Anastomosis	11
Band Release	05
Volvulus Derotation	03
Hernia Repair	05
Resection & Hernia Repair	04
Meckel's Diverticulectomy	01
Resection & Stoma	01
TOTAL	**41**

LARGE BOWEL OBSTRUCTION- 9 cases

CAUSES	CASES
Resection & Anastomosis	03
Colostomy	05
Milking of Intussussception	01
TOTAL	**09**

9. **COMPLICATIONS**

Complications in 50 cases of acute intestinal obstruction:

PARTICULARS	NO. OF CASES	PERCENTAGE
Morbidity	14	28
Mortality	06	12

Causes of morbidity

Wound sepsis, burst abdomen, faecal fistula, pulmonary infections were included as causes of morbidity.

Complications	No. of cases
Wound Dehiscence	7
Chest infection	5
Faecal fistula	1
Septicemia	3
Hypothermia	1

Causes of mortality

- Septicemia: 3
- Respiratory Infection: 2
- Multi Organ Failure: 1
- Hypothermia:1

Presence of strangulation and co-morbid conditions added mortality.

10. **DURATION OF STAY IN HOSPITAL**

Most patients were discharged in the 2nd week.

Weeks	Patients
0-1	05
1-2	23

2-3	11
3-4	05
4-5	03
5-6	01
6-7	02

V. Discussion

Intestinal obstruction is one of the common clinical entity. The mortality is reduced significantly by instituting the treatment at the earliest period. 1–4% of mortality in emergency surgeries is contributed by acute intestinal obstruction[15].

The following were the observations made from the study of 50 patients of acute intestinal obstruction in both children and adults at Mediciti General Hospital, Ghanpur

INCIDENCE

In the present series small bowel obstruction contributed to 82% and large bowel obstruction 18%. This is comparable with reports of Michel[37] and Becker[38] where small bowel obstruction constituted to 80% and large bowel obstruction constituted 20%.

Site	Present Series	Bhansali. S.K., et al
Small intestine	82%	78.18%
Large intestine	18%	21.8%

AGE INCIDENCE

The acute intestinal obstruction occurs in all age groups.
Maximum incidence was seen between age group of 0–10 yrs (24%).
Over all standard deviation is 24.57 years.
Earlier studies conducted by Gill and Eggleston[18] has reported 19.04% of cases in age group of 0–10 yrs.
In another study by Budharaj[39] reported 13% of cases of acute intestinal obstruction below 12year age.
Fuzan[10] reported mean age of 56 yrs.

Age	Present Series	Bhansali S.K. et al
Range	New Born – 85 years	7months – 70 years
Mean	35.4 years	30.1 years

SEX INCIDENCE

In our study the incidence of intestinal obstruction in males was 36 (72%) and that of females was 14 (28%). Male to female ratio is 2.6:1.0 (3:1)
Fuzan[10] and Lee[28] reported 2:1 male to female ratio.
Budharaj[39] reported in his study a ratio of 4:1 between male and female.

Sex	Present Series	Demir K. et al
Male	72%	42.3%
Female	28%	57.7%

ETIOLOGY & MODE OF PRESENTATION

In our study the following etiological factors were found,

- Adhesions: 26%
- Hernias: 18%
- Volvulus: 18%
- Bands: 12%
- CA colon: 06%
- Intussusceptions: 06%
- Hirschprung's: 06%
- Tubercular stricture: 04%
- Meckel's diverticulum: 02%
- Meconium ileus: 02%

ADHESIONS

A total of 26% of cases attributed to adhesions. Among adhesions 24% of the intestinal obstruction was due to postoperative adhesions and remaining 2% was found to be non specific.
Majority of incidence was found within 1 year of surgery.
Jain and Prasad[40] found that adhesions contributed for intestinal obstruction upto 25.5%.
Ti and Young[41] reported that postoperative adhesions and bands contributed upto 23.8% as cause of intestinal obstruction in 62 cases with only postoperative adhesions in 52 patients (19.2%)
Fuzan[10] study in 582 patients found that, in 246 (42.2%) patients the cause for intestinal obstruction was adhesions due to previous operations.

HERNIA

A total number of 9 (18%) cases of intestinal obstruction are related to hernia inthis study of 50 cases. Out of these 9, 4 (44%) cases are strangulated hernia.
All 9 cases of hernia are in male patients.
All 4 of the strangulated hernia patients underwent resection and anastomosis.
In other five cases only hernia repair was done. All cases were of inguinal hernia.
In the series of Michel G. Sarr (1983) shows hernia related strangulation waspresent in 42% patients.
Budharaj[39] studies revealed the etiology for acute intestinal obstruction secondary to obstructed hernia (small bowel and large bowel) accounted for 33%. In his study, the incidence of gangrene was up to 22%.

VOLVULUS

Volvulus constituted for about 18% in our studies that is 9 cases.
Out of these 9 cases, 7 were small bowel volvulus and 2 cases were of sigmoid volvulus.
A study conducted by Sankaran[42] reported 24 cases of volvulus in South India among which sigmoid volvulus predominated forming 50% of cases.
Budharaj[39] series revealed that 18.2% of intestinal obstruction was due to volvulus & in that 11.9% was due to small bowel volvulus and 6.19% due to large bowel volvulus.
Ramachandran[19] in his study quotes that volvulus is the second commonest cause of small bowel obstruction which accounted for nearly 24%.
Gill[18] reported that incidence of volvulus was 25%(36cases) , out of these smallbowel volvulus accounted for 23 patients and large bowel volvulus for 13 patients.

BANDS

In our study intestinal obstruction due to bands accounted for 12%.
A study series by Gill and Eggleston[18] of 147 cases showed that 6.8% of small intestinal obstruction is due to bands.

MALIGNANCY

In the present study acute intestinal obstruction related to malignancy constituted for 6%(3 cases). Two of the 3 are due to stricturous growth in left colon (one in sigmoid and one in descending colon) and one from right colonic growth.
Ti[41] noted that carcinoma of descending colon and rectum constituted 37.2%.
Ascending colon and caecum constituted 9.8%.
Thompson[44] in his series recorded the incidence of obstructing carcinoma of right colon equals 26% and left colon 69%.
Ramachandran[19] found in his study that sigmoid colon cancer accounted for 6.6% of intestinal obstruction in large bowel, which is nearer to our study.
Fuzan[10] revealed the cause of malignant large bowel obstruction of whichascending colon constituted 3.38% and sigmoid colon constituted up to 27%.
In our study sigmoid colon cancer, descending & ascending colon accounted 33.3% each.

INTUSSUSCEPTION

In our study of 50 cases of acute intestinal obstruction 3 cases were ofintussusception (6%), out of these 3 cases, 2 were causing small bowel obstruction and 1large bowel obstruction. All three were found in < 10yr of age.
Ti[41] revealed his study of 261 patients the incidence of intussusception accounted for 6.3% (17 cases) of intestinal obstruction. In this 17 cases, 14 were infants and 3 adults.
Another series by Kuruvilla[46] intussusception accounted for 6.3% of the cases of total intestinal obstruction.

HIRSCHPRUNG'S DISEASE

Hirschprung's disease accounted for 6% (3 cases) in our studies.
In study of Ti[41]Hirschprung's disease accounted for 4.8% of causes ofintestinal obstruction.
In study series by Ramachandran[19]Hirschprung's disease constituted for 10.4% cases of the pediatric intestinal obstruction

TUBERCULAR STRICTURE
The present study accounted for 4% (2cases) of tubercular stricture as a cause for intestinal obstruction.
Budharaj[39] in review of 242 cases reported that intestinal tuberculosis giving rise to acute intestinal obstruction was seen only in 2.1% of cases.
The study series of Sircar[47] reported to have 5% of cases of abdominaltuberculosis present with acute intestinal obstruction.

Site	Present Series	Bhansali S.K. et al
Small Intestine	**04%**	**78.18%**
Ileocaecal Region	–	**21.8%**

MECKEL'S DIVERTICULUM
Our study concluded with the incidence of Meckel's diverticulum constituting for 2% (1case) of acute intestinal obstruction.
Budharaja[39] reported to have incidence of 1.23% of Meckel's diverticulumcausing intestinal obstruction.
Ramachandran[19] in series stated about 4.2% of acute intestinal obstruction wasdue to Meckel's diverticulum.

MECONIUM ILEUS
The incidence of meconium ileus is 1 in 2000 live births 49. In our study it wasonly one case that caused intestinal obstruction.

CLINICAL FEATURES – SYMPTOMS & SIGNS
Maximum presenting symptoms in this study was pain abdomen – 78% (39 cases), vomiting –70% (35 cases), distention abdomen –58% (29 cases), constipation –52% (26 cases).
Asbun[50] in their retrospective analysis of 105 cases of small bowel obstructionfound that incidence of pain abdomen 82%, vomiting 88%, were commoner than constipation (28%) and distention of abdomen (56%).
Budharaj[39] in his study reported that, symptoms of in order of frequency were pain abdomen 95%, distention of abdomen 82%, vomiting 75%, absolute constipation 50% constituting acute intestinal obstruction.

Symptoms & Signs	Present Series	Bhansali S.K. et al
Pain	78 %	96.05%
Vomiting	70 %	89%
Constipation	52 %	55%
Distension	58 %	43%
Tenderness	86 %	33%
Guarding	42 %	–

Duration of pain

Duration	Present Series	Bhansali S.K. et al
0-24hrs	32%	25%
2–10days	46%	31.5%

History of previous pain

	Present Series	Bhansali S.K. et al
Duration of pain	4–7 months	1month–18years

X-RAY FINDINGS
Multiple air fluid levels were the most common finding on x-ray erect abdomen accounting for 56% of positive cases.

Findings	Present Series	Bhansali S.K. et al
Multiple air fluid levels	56%	76.1%
Volvulus	18%	1%
Pneumoperitoneum	--	--

MANAGEMENT

- All cases were operated in this study.
- Adhesiolysis done in 11 cases.
- Resection and anastomosis was done in 14 cases
- 2 cases of tubercular stricture of ileum (Ileo-transverse anastomosis)
- 4 cases of volvulus (small bowel volvulus), which had gangrenous changes and 2 cases of small bowel intussusception.
- 2 cases of dense adhesions
- 1 case of band (causing twist of bowel)
- 1 case of carcinoma colon and 2 cases of sigmoid volvulus.
- Release of bands was done in 5 cases.
- Derotation / undoing of volvulus was done in 3 cases.
- Only hernia repair done in 5 cases.
- Resection and hernia repair done in 4 cases.
- Colostomy done in 5 cases (2 cases of carcinoma, 3 Hirschprung's disease)
- Milking of intussusception in 1 case.

INTRAOPERATIVE FINDINGS

Adhesions were the most common finding found followed by volvulus and tubercular strictures.

Findings	Present Series	Bhansali S.K. et al
Adhesions	**26%**	**27.4%**
Volvulus	**14%**	**1.48%**
Strictures	**4%**	**40.7%**

OPERATIVE PROCEDURE

Surgery	Present Series	Bhansali S.K. et al
Resection	38%	24.4%
Adhesiolysis	22%	17%
Anastomosis	22%	35.78%

POST OPERATIVE COMPLICATIONS

- Wound infection: 5 cases
- Chest infection: 5 cases
- Faecal fistula: 1 case
- Wound dehiscence: 2 cases
- Septicemia: 3 cases
- Multi organ failure: 1 case
- Hypothermia: 1 case
- Deaths: 7 cases

Complication	Present Series	Bhansali S.K. et al
Wound Infection	7	5.4
Chest Infection	5	--
Faecal Fistula	1	2.9
Septicemia	3	--
Hypothermia	1	--
Total (%)	34	22.94

MORTALITY

	Present Series	Bhansali S.K. et al
% of cases	14%	11.84%

VI. Conclusion

- The occurrence of acute intestinal obstruction is more in small bowel.
- All age groups from newborn to elderly were involved.
- The incidence of intestinal obstruction is more common in malescompared to females.
- Intestinal obstruction was found more common in young children (First decade).
- Mode of presentation also differs in different levels of intestinal obstruction, small bowel obstruction mainly present with colicky abdominal pain and vomiting, as compared to large bowel obstruction where distention and constipation were predominant symptoms.

- Adhesions accounted for majority of small bowel obstruction (26%).
- Malignancies are common causes of large bowel obstruction.
- Tubercular stricture contributed 4% of all cases.
- The clinical examination stressed upon vital signs, per abdominal examination.
- Plain X-ray erect abdomen is the single important diagnostic tool for diagnosing intestinal obstruction and its level of obstruction.
- The distal the obstruction the greater the accuracy found.
- Early recognition and timely intervention is important to prevent the bowel going for gangrenous changes.
- Abdomen is literally said as a magic box, any surgeon should be well prepared to take on table proper decision for the found pathology.
- Other causes of acute intestinal obstruction in our series were obstructed hernias, volvulus, bands, tubercular stricture, Meckel's diverticulum, intussusceptions and meconium ileus.
- Morbidity was due to anastomotic leak, would infection, chest infection andwound dehiscence.
- 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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