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AETIOLOGICAL SPECTRUM, CLINICAL PROFILE AND MANAGEMENT OUTCOME OF MECHANICAL INTESTINAL OBSTRUCTION: A PROSPECTIVE OBSERVATIONAL STUDY FROM A TERTIARY CARE CENTRE IN NORTH INDIA

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ABSTRACT

Background: The causes of mechanical intestinal obstruction differ between regions and change over time. Prospective data from the north india region are lacking. We studied the aetiology, clinical profile, management and early outcomes of mechanical obstruction at a tertiary care centre in North India.

Materials and Methods: This prospective observational study enrolled all consenting patients admitted with mechanical intestinal obstruction to the Department of General Surgery, Government Medical College and Hospital, Chandigarh, between May 2021 and May 2022. Paralytic ileus was excluded. Demographic, clinical, laboratory, radiological, operative, histopathological and outcome data were recorded on a structured proforma. Categorical variables were compared with the chi-square or Fisher's exact test and hospital stay with the Mann–Whitney U test.

Results: Of 82 patients (mean age 43.8 ± 19.2 years; 42 women, 51.2%), 71 (86.6%) had small bowel and 11 (13.4%) large bowel obstruction. Abdominal pain (86.6%) and distension (85.4%) were the leading symptoms, and 40 patients (48.8%) had undergone previous abdominal surgery. Adhesions (22, 26.8%) and abdominal tuberculosis (20, 24.4%) were the commonest causes, followed by colonic malignancy (9, 11.0%) and obstructed hernia (8, 9.8%). Fifteen patients (18.3%) were managed conservatively; all were selected patients with adhesive or tubercular obstruction, and no patient with any other cause was treated without surgery ($p < 0.001$). Sixty-seven (81.7%) required surgery. A stoma was created in 24 operated patients (35.8%) and adhesiolysis was performed in 16 (23.9%). Surgical site infection affected 19 of 67 operated patients (28.4%). Median hospital stay was 7 days (IQR 5.5–9) after surgery and 4 days (IQR 3–4) after conservative care ($p < 0.001$). A hospital stay beyond 7 days was more frequent in patients who had a complication during admission than in those who did not (62.1% vs 20.8%, $p < 0.001$). One patient died (1.2%).

Conclusion: In this single-centre cohort, adhesions and abdominal tuberculosis together accounted for half of all mechanical obstructions. Conservative management was successful only in selected patients with these two causes. Abdominal tuberculosis should be considered in the differential diagnosis in similar settings, and surgical site infection was the main source of postoperative morbidity. Larger multicentre studies are needed to confirm these findings.

Keywords: Intestinal obstruction, Small bowel obstruction, Adhesions, Abdominal tuberculosis, Laparotomy, Surgical site infection; India.

INTRODUCTION

Intestinal obstruction accounts for 12–16% of emergency surgical admissions for acute abdomen. About four in five cases involve the small bowel.[1,2] Obstruction may be mechanical, where the lumen is physically blocked, or functional, where peristalsis fails. Mechanical obstruction carries the greater risk of peritonitis and usually drives the decision to operate.

The causes of obstruction have shifted over the past century. As elective hernia repair became routine , adhesive obstruction replaced strangulated hernia as the leading cause in developed countries.[3,4] Colorectal cancer now dominates large bowel obstruction in the same settings.3 Low- and middle-income countries show a different pattern. Obstructed hernia, sigmoid volvulus and abdominal tuberculosis remain frequent, and presentation is often delayed.[5–7]

India shows wide variation even between its own regions. Series from eastern India report obstructed hernia as the leading cause,[7] while a recent North Indian series found ileo-caecal tuberculosis most common.[8] Other centres report adhesive obstruction first.[9] These differences matter. They shape the index of suspicion in the emergency department, the choice of imaging, the likely success of non-operative care, and the need for histopathology and antitubercular therapy after surgery.

Modern management rests on early resuscitation, nasogastric decompression and accurate imaging. Contrast-enhanced computed tomography (CECT) identifies the transition point and signs of strangulation, and helps select patients for a trial of conservative care. [10–12] A trial of non-operative management with water-soluble contrast is now standard for adhesive small bowel obstruction without signs of ischaemia and peritonitis. [4,12] How well these principles apply to populations with a high burden of abdominal tuberculosis is less clear.

No prospective study has described mechanical intestinal obstruction in the Chandigarh region, which serves patients from Punjab, Haryana, Himachal Pradesh and Chandigarh. We therefore studied the aetiology, clinical profile, management and in-hospital outcomes of patients admitted with mechanical intestinal obstruction to a tertiary teaching hospital in this region.

MATERIALS AND METHODS

Study Design and Setting: This was a prospective observational study conducted in the Department of General Surgery, Government Medical College and Hospital (GMCH), Sector-32, Chandigarh, a tertiary teaching hospital, with the Departments of Pathology and Radio-diagnosis. Patients were enrolled from May 2021 to May 2022. The study is reported according to the STROBE statement.[13]

Participants

All patients of any age admitted through the surgical emergency or ward with a clinical and radiological diagnosis of mechanical intestinal obstruction were eligible. Patients with paralytic ileus, those who declined consent and those who left against medical advice were excluded. Written informed consent was obtained from each patient, or from a parent or guardian for patients under 18 years.

Sample size

Hospital records showed about 150 admissions for intestinal obstruction a year, 70% of them small bowel. With 95% confidence and 10% absolute precision, the minimum sample was 81. Allowing 10% for non-response, the target was 90 patients.

Data collection

A structured proforma recorded age, sex, symptoms and their duration, previous abdominal surgery, history of tuberculosis or malignancy, and comorbidities. Examination findings included vital signs, abdominal scars, distension, visible peristalsis, lumps, hernial orifices, tenderness, guarding, rigidity, bowel sounds and digital rectal examination.

Baseline investigations were complete blood count, serum electrolytes, renal and liver function tests, serum amylase and lipase, random blood glucose, coagulation profile and arterial blood gas analysis. All patients had erect and supine abdominal radiographs and an erect chest radiograph. Ultrasonography and CECT of the abdomen were performed when clinically indicated.

Management protocol

All patients were resuscitated with intravenous crystalloids, decompressed with a nasogastric (Ryle's) tube and catheterized to monitor urine output. Broad-spectrum intravenous antibiotics, analgesics and antiemetics were started. Patients with suspected adhesive obstruction received an oral water-soluble contrast (Gastrografin) challenge.

Haemodynamically stable patients without peritonitis or features of adhesive obstruction were given a conservative trial of 24–48 hours. Improvement was judged by reduced distension, falling nasogastric output, passage of flatus or stool and clinical stability. Patients with peritonitis, suspected strangulation, a complete large bowel obstruction or a failed conservative trial underwent surgery after resuscitation. All resected specimens and biopsies were sent for histopathology.

Definitions and outcomes

Small bowel obstruction (SBO) was obstruction proximal to the ileocaecal valve; large bowel obstruction (LBO) was obstruction distal to it. Acute obstruction was a short history with rapid progression; chronic obstruction was a history of recurrent or progressive symptoms over weeks. The primary outcomes were the aetiological spectrum and the mode of management. Secondary outcomes were operative procedures, postoperative complications, length of hospital stay and in-hospital mortality. Surgical site infection (SSI) was recorded when there was purulent discharge from the incision. Morbidity

was defined as any complication recorded during the index admission. It was assessed in all 82 patients, and patients managed conservatively were included in the analysis of hospital stay.

Statistical analysis

Data were analysed with IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY). Continuous variables are presented as mean ± standard deviation or median with interquartile range (IQR), and categorical variables as number and percentage. Categorical variables were compared with the chi-square test or Fisher's exact test when expected counts were below 5. Hospital stay was compared between groups with the Mann–Whitney U test. A two-tailed p value below 0.05 was considered significant.

RESULTS

Baseline characteristics

Eighty-two patients were enrolled. [Figure 1] Their ages ranged from 12 to 85 years (mean 43.8 ± 19.2 years), with peaks in the third and fifth decades. There were 42 women (51.2%) and 40 men (48.8%). Most patients (59, 72.0%) presented 3–7 days after symptom onset. Forty (48.8%) had undergone previous abdominal surgery, three of them more than once [Table 1].

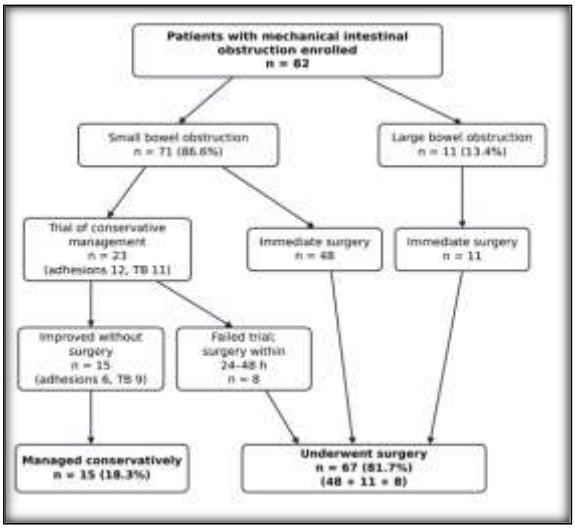


Figure 1. Flow of patients through the study

All 23 patients offered a conservative trial had small bowel obstruction due to adhesions or abdominal tuberculosis (TB). All patients with large bowel obstruction underwent immediate surgery.

Table 1: Baseline characteristics of the study population (n = 82)

Characteristic	n (%)
Age, mean ± SD (years)	43.8 ± 19.2
Age ≤ 20 years	11 (13.4)
Age 21–30 years	15 (18.3)
Age 31–40 years	13 (15.9)
Age 41–50 years	15 (18.3)
Age 51–60 years	11 (13.4)
Age 61–70 years	9 (11.0)
Age > 70 years	8 (9.8)
Female sex	42 (51.2)
Symptom duration < 3 days	12 (14.6)
Symptom duration 3–7 days	59 (72.0)
Symptom duration > 7 days	11 (13.4)
Any comorbidity	13 (15.9)
Diabetes mellitus / hypertension	4 (4.9) / 4 (4.9)
Hypothyroidism	2 (2.4)
Asthma / coronary artery disease / depression	1 (1.2) each
Previous abdominal surgery	40 (48.8)
Exploratory laparotomy	10
Hysterectomy / appendicectomy	7 / 7
Open cholecystectomy	6
Tubectomy / caesarean section	3 / 2
Mesh hernioplasty / surgery for ectopic pregnancy	1 / 1

Clinical presentation

Abdominal pain was the commonest symptom (71, 86.6%), followed by distension (70, 85.4%), obstipation (62, 75.6%) and vomiting (55, 67.1%). On examination, 47 patients (57.3%) had tenderness and 17 (20.7%) had rigidity. Bowel sounds were absent in 45 (54.9%). Seventy-eight patients (95.1%) presented acutely. The four with chronic obstruction all had colonic cancer. [Table 2]

Table 2: Clinical signs and imaging findings

Finding	n (%)
Abdominal distension	70 (85.4)
Previous surgical scar on examination*	39 (47.6)
Tenderness	47 (57.3)
Guarding	27 (32.9)
Rigidity	17 (20.7)
Rebound tenderness	10 (12.2)

Visible hernia at a hernial site	8 (9.8)
Visible or palpable lump	6 (7.3) / 5 (6.1)
Visible peristalsis	2 (2.4)
Bowel sounds absent / sluggish / increased	45 (54.9) / 20 (24.4) / 17 (20.7)
Empty ballooned rectum on digital examination	25 (30.5)
Plain abdominal radiograph (n = 82)	
Dilated bowel loops	32 (39.0)
Multiple air-fluid levels	25 (30.5)
No specific abnormality	25 (30.5)
CECT abdomen (n = 48)	
Transition point identified	31 (64.6)
Terminal / mid / proximal ileum	13 / 8 / 4
Jejunum	6
Circumferential bowel wall growth	6 (12.5)
Mesenteric lymphadenopathy	4 (8.3)
Stricture	3 (6.3)
Malrotation / faecolith / intussusception / contrast leak	1 each

*Scar visible on clinical examination (n = 39). Forty patients (48.8%) gave a history of previous abdominal surgery [Table 1]. History and examination findings were recorded separately, which accounts for the difference of one patient.

Mean haemoglobin was 11.2 ± 2.1 g/dL (range 6.9–18.8). Mean blood urea was 33.9 ± 25.4 mg/dL and mean serum creatinine 0.84 ± 0.32 mg/dL. Serum sodium ranged from 120 to 156 mmol/L and potassium from 2.6 to 5.9 mmol/L.

Level and aetiology of obstruction

Seventy-one patients (86.6%) had small bowel obstruction and 11 (13.4%) large bowel obstruction. Adhesions and abdominal tuberculosis together accounted for 42 cases (51.2%). Colonic malignancy caused 9 of the 11 large bowel obstructions; sigmoid and caecal volvulus caused the other two. [Figure 2 and Table 3]

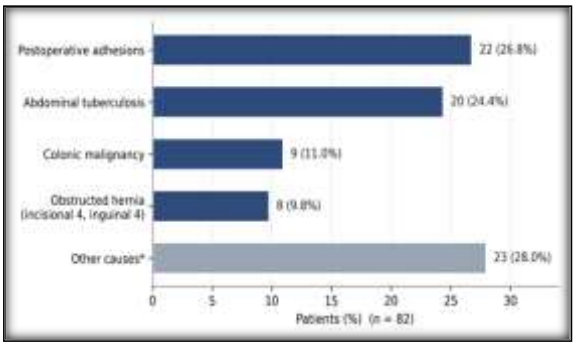


Figure 2: Aetiology of mechanical intestinal obstruction (n = 82)

Table 3: Aetiology of obstruction and mode of management

Aetiology	Total, n (%)	Level	Conservative, n	Operative, n
Postoperative adhesions	22 (26.8)	SBO	6	16
Abdominal tuberculosis	20 (24.4)	SBO	9	11
Colonic malignancy	9 (11.0)	LBO	0	9
Obstructed incisional hernia	4 (4.9)	SBO	0	4
Obstructed inguinal hernia	4 (4.9)	SBO	0	4
Congenital or fibrous band	4 (4.9)	SBO	0	4
Meckel's diverticulum	3 (3.7)	SBO	0	3
Volvulus (small bowel 1, sigmoid 1, caecal 1)	3 (3.7)	SBO 1, LBO 2	0	3
Metastatic ovarian carcinoma	2 (2.4)	SBO	0	2
Enterolith	2 (2.4)	SBO	0	2
Gangrenous bowel	2 (2.4)	SBO	0	2
Intussusception (jejunojejunal 1, ileocaecal 1)	2 (2.4)	SBO	0	2
Benign stricture	1 (1.2)	SBO	0	1
Malrotation	1 (1.2)	SBO	0	1
Appendicular perforation with obstruction	1 (1.2)	SBO	0	1
Intestinal lipoma	1 (1.2)	SBO	0	1
Trichobezoar	1 (1.2)	SBO	0	1
Total	82 (100)		15 (18.3)	67 (81.7)

SBO, small bowel obstruction; LBO, large bowel obstruction.

Values are number of patients (percentage of the cohort). *Other causes: congenital or fibrous bands (4), Meckel's diverticulum (3), volvulus (3), metastatic ovarian carcinoma (2), enterolith (2), gangrenous bowel (2), intussusception (2), and benign stricture, malrotation, appendicular perforation, intestinal lipoma and trichobezoar (1 each).

Management

Twenty-three patients with adhesive or tubercular obstruction received a conservative trial, and 15 of them (65.2%) settled without surgery. [Figure 1] The trial failed in 6 of 12 adhesive cases and 2 of 11 tubercular cases, and these 8 patients went on to surgery within 24–48 hours. No patient with any other cause was managed conservatively (15/42 vs 0/40, $p < 0.001$, Fisher's exact test). All 11 patients

with large bowel obstruction underwent surgery, compared with 56 of the 71 patients (78.9%) with small bowel obstruction (p = 0.20). Similarly, all 11 patients with symptoms for more than 7 days underwent surgery, compared with 56 of the 71 patients (78.9%) whose symptoms had lasted 7 days or less (p = 0.20). A previous laparotomy did not change the likelihood of conservative success (7/40 vs 8/42, p = 1.00). Mean age did not differ between conservatively and operatively managed patients (39.5 vs 44.9 years, p = 0.42).

In total, 67 patients (81.7%) underwent laparotomy: 59 as the first line of treatment and 8 after a failed conservative trial. A stoma was created in 24 of the 67 operated patients (35.8%), either as the main procedure (end or loop ileostomy in 14, diversion loop ileostomy in 3) or as part of a colonic resection (right hemicolectomy with ileostomy in 5, left hemicolectomy with colostomy in 1 and Hartmann's procedure in 1). Adhesiolysis was performed in 16 patients (23.9%). [Table 4] Ileostomy was needed in six tubercular and four adhesive obstructions.

Table 4: Primary operative procedures (n = 67)

Procedure	n (%)	Main indications
Adhesiolysis	16 (23.9)	Adhesions (12), tuberculosis (2), incisional hernia (2)
End or loop ileostomy	14 (20.9)	Tuberculosis (6), adhesions (4), incisional hernia (2), gangrenous bowel (2)
Diversion loop ileostomy	3 (4.5)	Metastatic ovarian carcinoma (2), sigmoid carcinoma (1)
Segmental resection and anastomosis	9 (13.4)	Meckel's diverticulum (3), tuberculosis (2), intussusception (2), enterolith (1), stricture (1)
Right hemicolectomy	8 (11.9)	Colonic carcinoma (6), caecal volvulus (1), lipoma (1)
Left hemicolectomy	1 (1.5)	Descending colon carcinoma
Hartmann's procedure	1 (1.5)	Rectosigmoid carcinoma
Sigmoidectomy	1 (1.5)	Sigmoid volvulus
Band release	5 (7.5)	Bands (4), tuberculosis (1)
Reduction and herniorrhaphy	4 (6.0)	Obstructed inguinal hernia
Enterotomy and primary repair	2 (3.0)	Trichobezoar (1), enterolith (1)
Derotation of small bowel	1 (1.5)	Small bowel volvulus
Ladd's procedure	1 (1.5)	Malrotation
Appendicectomy	1 (1.5)	Appendicular perforation
Total	67 (100)	

Each patient is counted once, under the primary procedure. A stoma was created in 24 patients (35.8%): end or loop ileostomy (14), diversion loop ileostomy (3), right hemicolectomy with ileostomy (5 of the 8 right hemicolectomies), left hemicolectomy with colostomy (1) and Hartmann's procedure (1).

Histopathology was available for 41 operated patients. It showed organising serositis in 8, adenocarcinoma in 6 and tuberculosis in 6. Uncommon findings included amyloidosis, amoeboma, intestinal lipoma and necrotising lymphadenitis (1 each).

Outcomes

Twenty-nine of the 82 patients (35.4%) had at least one complication during admission. Surgical site infection was the commonest, affecting 19 of the 67 operated patients (28.4%) (Table 5). One patient died (1.2%). He was an 80-year-old man with a cardiac pacemaker and concurrent COVID-19 infection who presented with a strangulated inguinoscrotal hernia and died of septicaemia on the first postoperative day.

Table 5: Postoperative complications and outcome

Outcome	n	% of operated (n = 67)
Surgical site infection	19	28.4
Respiratory tract infection	4	6.0
Septicaemia needing ICU care	3	4.5
Burst abdomen	2	3.0
Anastomotic leak	1	1.5
In-hospital death	1	1.5

Median hospital stay was 6 days (IQR 4–9) for the whole cohort. It was 7 days (IQR 5.5–9) after surgery and 4 days (IQR 3–4) after conservative treatment (p < 0.001, Mann–Whitney U test). Patients with a complication stayed longer: 18 of 29 (62.1%) stayed more than 7 days, compared with 11 of 53 (20.8%) without a complication ($\chi^2 = 14.39$, df = 2, p < 0.001; Table 6).

Table 6: Length of hospital stay by in-hospital morbidity (all patients, n = 82)

Hospital stay	Complication (n = 29)	No complication (n = 53)
< 3 days	0	2 (3.8)
3–7 days	11 (37.9)	40 (75.5)
> 7 days	18 (62.1)	11 (20.8)

Values are n (%) of each column. Morbidity was any complication recorded during the index admission. $\chi^2 = 14.39$, df = 2, p < 0.001 (chi-square test).

DISCUSSION

This prospective study found that adhesions and abdominal tuberculosis together caused half of all mechanical intestinal obstructions at a North Indian tertiary centre. Conservative management was successful only in selected patients with these two causes; all other patients required surgery. Four in five patients needed surgery, more than one in three operated patients required a stoma, and wound infection was the main complication. In-hospital mortality was low at 1.2%.

Demographics and presentation

The mean age of 43.8 years matches other Indian series, which report means between 41 and 50 years.[7,9,14] Our cohort was younger than Western cohorts, where the mean age now exceeds 60 years.[3] Most Indian series show a clear male predominance, ranging from 64% to 75%.[7,8,9,15] We found a slight female majority. This may reflect the large share of adhesive obstruction after gynaecological and obstetric surgery, which made up 13 of the previous operations in our patients.

Abdominal pain and distension were the leading symptoms, as in most comparable series.[9,14,16] Vomiting was less frequent (67.1%), consistent with the predominance of distal ileal obstruction on CECT. The typical delay of 3–7 days before admission is longer than that reported from Mumbai,[14] which may reflect the referral pattern of a regional tertiary centre.

Aetiology

Adhesions were the leading cause (26.8%), close to the 35.8–37.5% reported by several Indian centres.[14,17,18] This is lower than the 54% reported by Playforth et al. in the United States,[19] and far above the 16% reported from eastern India a decade earlier.[7] The shift mirrors the change described by Drożdż and Budzyński, in which adhesions replaced hernia as abdominal surgery became more common and elective hernia repair more widely available.[3]

Abdominal tuberculosis was the second commonest cause (24.4%). This is among the highest proportions reported, alongside the 19.4% reported from another North Indian centre,[8] and 21.6% from Pandey.[18] India carries the largest share of the global tuberculosis burden,[20] and the ileocaecal region is the commonest site of gastrointestinal involvement.[6,21] Tuberculosis should therefore be considered in patients in similar settings who present with small bowel obstruction and no previous surgery or hernia. Histopathological confirmation was obtained in only 6 of the 20 cases. This shows the difficulty of proving the diagnosis and the need to send mesenteric nodes and tissue for histology, culture and molecular testing at every laparotomy.

Obstructed hernia caused only 9.8% of cases. This contrasts sharply with the 36% reported from eastern India,[7] and the 50% reported by Deshmukh and Maske.[9] Wider access to elective hernia repair in an urban catchment may partly explain this difference. Colonic cancer caused 9 of 11 large bowel obstructions, in keeping with the modern pattern in which malignancy has replaced sigmoid volvulus as the main cause of colonic obstruction.[3]

Table 7: Comparison with published series

Series	Region	n	Adhesions (%)	Tuberculosis (%)	Hernia (%)	Malignancy (%)	Operated (%)	Mortality (%)
Playforth et al., 1970.[19]	USA	111	54	–	23	5	–	–
Adhikari et al., 2010.[7]	Eastern India	367	15.5	14.2	35.9	16.6	78.5	7.4
Deshmukh and Maske, 2016.[9]	Western India	50	39	–	50	–	–	10.0
Alam et al., 2017.[8]	North India	263	14.8	19.4	–	8.7	100	5.3
Pandey, 2018.[18]	North India	134	35.8	21.6	7.5	9.7	–	–
Deolekar et al., 2019.[14]	Western India	80	37.5	–	–	–	62.5	8.8
Present study	North India	82	26.8	24.4	9.8	11.0 (+2.4 ovarian)	81.7	1.2

Dashes indicate data not reported in a comparable form. Mortality for Deolekar et al. is 7 deaths among all 80 patients.

Management

Only 18.3% of patients were managed without surgery. This is lower than the 38–43% reported by centres with a larger share of adhesive obstruction.[14,22]

The difference likely reflects case mix: every patient without adhesions or tuberculosis needed an operation. A conservative trial was offered only to selected, haemodynamically stable patients with adhesive or tubercular obstruction, and 15 of these 23 patients (65.2%) settled. This figure should not be read as the success rate of conservative treatment for mechanical obstruction in general. This is consistent with the Bologna guidelines, which recommend a trial of non-operative care with water-soluble contrast for adhesive small bowel obstruction without signs of strangulation.[4,12]

Our findings suggest that a similar approach may be reasonable for suspected tubercular strictures and adhesions in stable patients, with antitubercular therapy started once the diagnosis is secured.

In this cohort, a previous laparotomy was not associated with the success of conservative care. Clinical and CECT signs of ischaemia may therefore be more useful than surgical history alone when selecting patients for a conservative trial, as earlier studies have suggested.[10,11]

The stoma rate (24 of 67, 35.8%) may reflect late presentation, bowel oedema and a reluctance to anastomose inflamed tubercular bowel in an emergency. Whether earlier referral would reduce this rate cannot be determined from our data.

Complications and mortality

Surgical site infection affected 28.4% of operated patients. This is higher than the 12% reported in other Indian series.[7,9]

It is close to the 23% rate after gastrointestinal surgery in low-income countries in the GlobalSurg cohort, where contaminated and emergency cases fared worst.[23]

A hospital stay beyond 7 days was about three times as common in patients with a complication as in those without (62.1% vs 20.8%; Table 6). Wound protection devices, delayed primary closure in contaminated cases and strict perioperative bundles are practical targets for improvement.

Mortality (1.2%) was lower than the 5.3–10% reported in other Indian series.[7–9,14]

The single death occurred in an elderly patient with a strangulated hernia, a cardiac comorbidity and COVID-19 infection. Early resuscitation, selective CECT and prompt surgery once conservative care failed may explain the low figure, though the small sample limits firm conclusions.

Strengths and limitations

The main strengths are the prospective design, a structured proforma and histopathological review of operated specimens. The study has several limitations. It is a single-centre study, and the final sample of 82 fell short of the planned 90, partly because enrolment coincided with the COVID-19 pandemic.

CECT was selective rather than routine. The diagnosis of abdominal tuberculosis rested on combined clinical, radiological, operative and histological findings, and was histologically confirmed in a minority.

The volume and timing of Gastrografin and the criteria for failure of conservative care were not recorded in a standardised way. Outcomes were limited to the index admission, so recurrence, stoma reversal and long-term mortality are unknown.

The small number of events precluded multivariable analysis of predictors of surgery or complications.

CONCLUSION

In this single-centre cohort of 82 patients, adhesions and abdominal tuberculosis together accounted for half of all mechanical intestinal obstructions, and obstructed hernia was relatively uncommon. Conservative management was successful in 15 of 23 selected, stable patients with adhesive or tubercular obstruction, while all patients with other causes required surgery. These findings suggest that abdominal tuberculosis should be considered in the differential diagnosis in similar settings and that tissue should be sent for diagnosis at surgery. Surgical site infection was the commonest complication and was associated with longer hospital stay. Because of the modest sample size and single-centre design, these results may not apply to other populations, and larger multicentre studies with standardised protocols and long-term follow-up are needed.

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