

## **SURGICAL ASPECTS OF ABDOMINAL TUBERCULOSIS- A STUDY IN TERTIARY CARE HOSPITAL**

Ajay Babu K<sup>1</sup>, Harish Y. S<sup>2</sup>

<sup>1</sup>Assistant Professor Department of General Surgery, Sri Venkateshwara Medical College, Tirupathi, Andhra Pradesh.

<sup>2</sup>Junior Resident Department of General Surgery, Sri Venkateshwara Medical College, Tirupathi, Andhra Pradesh.

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### **ABSTRACT**

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#### **BACKGROUND**

The symptoms of abdominal tuberculosis are generally vague and nonspecific. It may mimic any intra-abdominal disease and can challenge the diagnostic skills. Tuberculosis of the Ileocaecal region ranks first in incidence among abdominal tuberculosis. Abdominal tuberculosis denotes involvement of the gastrointestinal tract, peritoneum, lymph nodes, and solid viscera, e.g., liver, spleen, pancreas, etc. The gastrointestinal tract is involved in 65% to 78% of patients; associated peritoneal and lymph node involvement is common in these patients. The management of gastrointestinal tuberculosis is still controversial. Surgery is done for complications such as obstruction, perforation, fistula, or a mass which does not resolve with medical therapy.

The aim of this study is to evaluate the surgical management of abdominal tuberculosis.

#### **MATERIALS AND METHODS**

A clinical study of fifty cases of abdominal tuberculosis treated surgically in different surgical units of tertiary care center, Tirupati from July 2015 to October 2016. A collection of common and rare manifestations of abdominal tuberculosis is presented hereunder. Stress was laid upon a thorough history taking and physical examination. The different surgical procedures were enumerated. All the routine investigations concerning the disease were done; a few were subjected to special investigations. The ensuing complications of the treatment were studied, and the cases were followed up.

#### **RESULTS**

The signs and symptoms of intestinal tuberculosis are nonspecific, and there are no unequivocal diagnostic features either clinically or radiologically. The most common presenting complaint was abdominal pain and the most common sign was abdominal tenderness. As a result, laparotomy and histopathological examination were frequently necessary to establish confirmatory diagnosis. It commonly affects the adults in their 3rd and 4th decades. Notably the earning age group hence can have economic implications. Also, females are affected at slightly younger age than males. The M: F ratio in the present series was 3:2. Patients commonly present with one of the complications and the most common among them is intestinal obstruction. Patients who present with a mass are of slightly higher age group and those presenting with a perforation are relatively younger. Early diagnosis is the key factor in avoiding systemic and local complications of intestinal tuberculosis. Hence a high index of clinical suspicion is needed. It was more difficult in cases of emergency laparotomy, the nature of the obstruction may go unrecognized, particularly in patients having acute symptoms, or caecal masses may be thought to be malignant. The most common diagnosis made was that of sub-acute intestinal obstruction (40%).

#### **CONCLUSION**

The approach to surgery should be conservative, with the aim of saving maximum bowel length, so stricturoplasty and anastomosis were the most common surgeries performed (34%) in the present series. A definitive procedure in the form of resection of diseased segment and primary anastomosis has done. But in presence of gross peritonitis, a two-stage procedure with a temporary ileostomy is preferable and safe. While other procedures like perforation closure, adhesiolysis, limited resection and right hemi colectomy are done. Wound infection is common, but most of them respond well to Anti Tubercular Treatment (ATT), so all patients should be started on 6 months of ATT, post operatively. Mortality is only 2%.

#### **KEYWORDS**

Tuberculosis, Stricturoplasty, Adhesiolysis, Stoma.

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#### **BACKGROUND**

Tuberculosis caused by *Mycobacterium tuberculosis*, detected as far back as 10000 BC, still remains a major public health problem worldwide.<sup>1</sup> 75% of tuberculosis cases in developing countries is in the economically productive age group (15-50 years). Tuberculosis is a major opportunistic infection in HIV patient. Abdominal tuberculosis represents the sixth most frequent form of extra pulmonary tuberculosis.<sup>2,3,4</sup> It denotes involvement of the

gastrointestinal tract, peritoneum, lymph nodes, and solid viscera, e.g., liver, spleen, pancreas, etc. The symptoms of abdominal tuberculosis are generally vague and nonspecific. It may mimic any intra-abdominal disease and can challenge the diagnostic skills.

Tuberculosis of the Ileocaecal region ranks first in incidence among abdominal tuberculosis.<sup>5</sup> Tuberculosis bacteria reach the gastrointestinal tract via haematogenous

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*Corresponding Author:*  
*Dr. Ajay Babu K,*  
*#4-3-485, B, Giripuram,*  
*Tirupati, Chittoor Dist. – 517501, Andhra Pradesh.*  
*E-mail: drajaybabuk@gmail.com*  
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spread, ingestion of infected sputum or contiguous spread from adjacent organs<sup>6</sup> The Management of Gastrointestinal tuberculosis is still controversial. Surgical intervention which was frequently used in the past for diagnosis is not necessary and is reserved for complications such as obstruction, perforation, fistula, or a mass which does not resolve with medical therapy.<sup>7</sup> In most cases a trial of medical therapy should be undertaken prior to surgical intervention.<sup>7</sup> However complications can be fatal and may occur after initiation of antituberculous medications.

Surgery is done for obstruction due to hypertrophic type of abdominal TB.<sup>8</sup> The Surgical treatment of intestinal tuberculosis too has passed through many phases, from the bypass procedures of the pre- antibiotic era to the radical surgeries such as Hemicolectomy and a limited ileocecal resection, and stricturoplasties.<sup>9</sup> Perforation is a serious complication of abdominal tuberculosis associated with high morbidity and mortality.<sup>10,11,12</sup>

The low incidence of tuberculous perforation is due to a reactive fibrosis of the peritoneum.<sup>13,14,15</sup> However, in recent years, intestinal perforation, which was relatively rare in the past, has been reported more frequently. The role of surgery in abdominal tuberculosis is: Diagnostic: for aetiopathological, microbiological diagnosis. Therapeutic: for Complications like intestinal obstruction, perforation and peritonitis.

#### *Aims and Objectives*

The aim of this study is to evaluate the surgical management of abdominal tuberculosis.

To analyse the various clinicopathological manifestations of abdominal tuberculosis and to study the various surgical treatment modalities and their complications in the management.

#### **MATERIALS AND METHODS**

A clinical study of 50 cases of abdominal Tuberculosis treated surgically in different surgical units of tertiary care centre, Tirupati from July 2015 to October 2016. A collection of common and rare manifestations of abdominal tuberculosis is presented hereunder. Stress was laid upon a thorough history taking and physical examination. The different surgical procedures were enumerated. All the routine investigations concerning the disease were done a few were subjected to special investigations. The ensuing complications of the treatment were studied, and the cases were followed up.

#### **RESULTS**

##### *Age Incidence*

In this study the age of the patients varied from 16 to 60 years. The mean age in the present series was 34 (33.56%) years. Maximum incidence seen in 21-30 years (36%) followed by 31-40 years (24%), 41-50 years (18%) and more than 50 years (8%). Most of the cases were in 2nd and 3rd decades of life contributing 60% of the total cases.

Age (years)	Number	Percentage
15-20	7	14
21-30	18	36
31-40	12	24
41-50	9	18
51-60	4	8
<b>Total</b>	<b>50</b>	<b>100</b>

**Table 1. Age Distribution.**

##### *Sex Incidence*

In the present series 62 % of cases were males and the remaining 38% formed by the females. Male: Female ratio was found to be 1.63: 1.

Sex	Number	Percentage
Male	31	62
Female	19	38
<b>Total</b>	<b>50</b>	<b>100</b>

**Table 2. Sex Distribution**

##### *Socio- Economic Status*

In the present study 96% of patients belonged to lower socioeconomic status. Two patients (4%) are from higher socioeconomic status.

##### *History of Pulmonary Tuberculosis*

In the present series 6 cases (12%) had history of pulmonary Tuberculosis. One was on treatment while he presented with abdominal tuberculosis and three had discontinued the treatment after intensive phase of DOTS. Remaining two cases completed the full course of ATT.

##### *Symptomatology*

The symptoms in the present series had duration ranging from one day to few years. 21 (42%) cases had one or more symptoms for duration of >3 months. In the present series abdominal pain was the most common presenting complaint, present in 90 % of cases. Lower abdominal pain was the commonest followed by per umbilical and generalized abdominal pain. In most cases pain was described as colicky and intermittent. Other common symptom was altered bowel habits (52%), constipation were found in 48% of patients, diarrhoea was found in two (4%) cases. Other symptoms like vomiting seen in 46% of patients, relief of abdominal pain on vomiting was found in most cases. Abdominal distension was the presenting complaint in 44% of cases.

Fever was present in 28% of case, it was mild to moderate, with evening rise of temperature. Anorexia and weight loss was found in 30% of cases, most of these cases

were that of sub-acute intestinal obstruction with duration of more than 2 months. Menstrual irregularities were a major complaint in 10 % of cases in women's.

Symptoms	Number	Percentage
Abdominal pain	45	90
Altered bowel habits	26	52
Abdominal distension	22	44
Fever	14	28
Vomiting	23	46
Mass per abdomen	4	8
Anorexia & wt. loss	15	30
Menstrual irregularities	5	10

**Table 3. Symptoms**

#### Physical Findings

In the present study abdominal tenderness was the most common finding being present in 56% of cases. Rebound tenderness was present in 14%, all of them were cases of perforative peritonitis. Abdominal distension was seen in 48% of cases, generalized distension was present in 10 (20%) patients and lower abdomen distension was found in 12 (24%) patients. Guarding and rigidity were present in 30% of cases and all of them were cases of hollow viscus perforation, and were all associated with rebound tenderness. Mass was found in 20% of cases, in most cases it was found in right iliac fossa and only one was in the right lumbar region. Hyperperistalsis was found in 18% of cases. Active Pulmonary Tuberculosis was found in 4 cases, one of them had extensive miliary mottling. No physical findings were found in two (4%) patients.

Signs	Number	Percentage
Tenderness	28	56
Abd. Distension	24	48
RIF Mass	10	20
Hyper peristaltic bowel sounds	9	18
Rigidity	15	30
Guarding	15	30
Mass other than RIF	1	2
No findings	2	4

**Table 4. Physical Findings**

#### Mode of Presentation

In the present series the most common diagnosis was that of Intestinal obstruction contributing 56% of these, 18% acute intestinal obstruction was the diagnosis and in the rest of the cases Sub-acute intestinal obstruction was the diagnosis, making it the single most common mode of presentation. Hollow viscus perforation with peritonitis secondary to small bowel perforation, was the diagnosis in 18% of cases. Mass per abdomen was the modes of presentation in 16% of cases. Abdominal cocoon was seen in 8% of cases. One case was preoperatively diagnosed as acute appendicitis. The preoperative diagnosis was more accurate in cases with ileocaecal mass and sub-acute obstruction than in cases that underwent emergency laparotomy for acute intestinal obstruction or perforative peritonitis.

Diagnosis	Number	Percentage
Subacute intestinal obstruction	19	38
Acute intestinal obstruction	9	18
Mass per abdomen	8	16
Perforative peritonitis	9	18
Abdominal cocoon	4	8
Acute appendicitis	1	2

**Table 5. Mode of Presentation**

#### Investigations

##### Blood Investigations

Haemoglobin estimation was done in all cases. It ranged from 6.7 gm% to 13 gm%. In the present series 24 cases (48%) were having Haemoglobin of less than 8 gm%. Sixteen cases (84%) are females remaining 8 are males. Erythrocyte Sedimentation Rate (ESR) was in range from 20mm to 81mm after one hour. Sputum AFB was positive in four of them.

##### Radiological Investigations

Chest- X- Ray: Four of them showed features of pulmonary tuberculosis, one of them showed miliary mottling. Erect- X- Ray abdomen: 22 cases showed multiple air fluid level suggesting obstruction, 9 cases had gas under diaphragm, and 21 had a normal X- ray. Barium study was done for two cases, of which showed narrowing of ileocaecal junction, strictures, pulled up caecum and ascending colon narrowing. Ultrasound abdomen: Sonological findings showed mass in 9, mesenteric lymph node enlargement was seen in three, 13 showed dilated air-filled bowel loops, free fluid was seen in 4 and in one case USG showed features of acute appendicitis. In 9 cases USG showed no abnormality. CT scan abdomen: 13 showed ileocaecal and ascending colon thickening, out of those 4 which showed mural thickening, eight showed significant luminal narrowing. In the present series eight cases showed fat stranding, omental thickening and 5 showed mesenteric or Para aortic lymph node enlargement.

##### Other Investigations

In the present series seven cases underwent Colonoscopy, biopsy was taken in three, all confirming the diagnosis of Tuberculosis, ascending colon narrowing was seen in seven cases, out of these three showed multiple mucosal nodules and fibrosis as well, and in one case only mucosal nodules were seen. Of the fifty cases, three patients underwent Diagnostic Laparoscopy, and biopsy was taken in three of these cases. Small multiple whitish nodules scattered all over the peritoneum (tubercles) were seen in one, variable degrees of omental thickening was seen in two. Ileocaecal and ascending colon thickening seen in two cases and mesenteric lymph node enlargement was seen in three of the cases who underwent the procedure, adhesions were seen in one.

##### Operative Findings

In the present series, forty-eight cases (96%), showed features of intestinal Tuberculosis; in the remaining two, one was a case of mesenteric cold abscess at the root of

mesentery pressing on jejunum and one showed features of acute appendicitis, with severely inflamed appendix. Most of the cases had multiple findings. Of all cases of intestinal Tuberculosis, ileocaecal thickening, small bowel stricture was the most common finding. Pulled up caecum with narrow ileocaecal valve was present in 3 cases. One case showed sigmoid colon thickening and in one case appendicectomy was done and was later diagnosed to be Tuberculosis. Small bowel strictures were found in 21 cases, three were in jejunum, rest all were in ileum. Ileal perforation was found in 12 cases, adhesions were found in eleven cases. Other common findings were enlarged mesenteric lymph nodes in 20 cases and omental thickening in 4 cases.

Operative Findings	Site	Frequency	Percentage
Perforation		12	24
	Ileum	11	22
	Jejunum	0	0
	Colon	1	2
Stricture		21	42
	Ileum	19	38
	Jejunum	2	4
	Colon	2	4
Bands & adhesions		11	22
Ileocaecal mass & mesenteric thickening	Terminal ileum & caecum	14	28
Mesenteric lymphadenitis		20	40
Peritoneal adhesions with cocoon formation	Peritoneum	4	8

**Table 6. Operative Findings**

#### Operative Management

In the present series, forty-six cases underwent definitive procedure; four patients had abdominal cocoon with extensive matting of the bowel and obstruction. The reason for surgery in most cases was either persistent pain with suspicion of tumoural lesion, intestinal obstruction or preoperative diagnosis of perforative Peritonitis. The common procedures that were, Resection and anastomosis was done in twelve cases (24%) followed by Resection and ileostomy was performed in seven cases (14%).

Strictureplasty done in 10% of cases, one case was that of jejunal stricture and rest were of ileal stricture. Primary closure of perforation was done in 5 (10%) cases rest all the perforative peritonitis cases underwent resections. Adhesiolysis was done for seven cases (14%). Limited (segmental) resection done in 16% of cases. One case underwent Limited resection for sigmoid colon Tuberculosis.

Right Hemicolectomy was done for 4% of cases. In four (8%) cases no procedure could be done because they had massive adhesions and probably from tubercular peritonitis, and was thought to be inoperable and only biopsy was taken. Peritoneal wash given and abdominal drains placed. Mesenteric lymph node biopsy was taken in 14% of cases. Biopsy was associated with other procedures where

significant mesenteric lymph nodal enlargement was seen. One case underwent Mesenteric cold abscess drainage and deroofting, one case underwent Appendicectomy and was subsequently diagnosed to be Tuberculosis, in histopathology.

Procedure	Number	Percentage
Strictureplasty	5	10
Resection anastomosis	12	24
Resection ileostomy	7	14
Mesenteric In biopsy	18	36
Adhesiolysis	7	14
Perforation closure	4	8
Limited resection	8	16
Colonic perforation	1	2
Right hemicolectomy	2	4
Appendicectomy	1	2
Drainage of abscess	1	2
Stoma closure	6	12

**Table 7. Surgical Procedures**

#### Complications

Operative morbidity was 68%, most of them having one or more complications. These were more frequent in those undergoing emergency surgery. The most common complications were wound infections (56%) of cases followed by pulmonary infections (24%). Two patients (4%) developed a faecal fistula and one (2%) developed burst abdomen requiring re-operation. In this series of fifty cases one patients died a mortality of 2%.

Complications	Number	Percentage
SSI	28	56
Pulmonary complications	12	24
Enterocutaneous fistula	2	4
Wound dehiscence	5	10

**Table 8. Complications**

#### Follow-Up

All cases had a regular follow-up at 1, 3, 6, 12 months; most of them were relieved of the symptoms. General condition of the patients improved with weight gain and correction of anaemia. The cases with ileostomy, closure were planned after two to three months after surgery. Two ileostomy cases didn't come for follow up.

#### Pathological Consideration

In the present series, Intestinal (including appendix) specimens were available for histopathological diagnosis in 43 cases; histopathological diagnosis was made by lymph node biopsy specimens in eighteen cases, which showed caseation and granulomas, suggestive of tuberculosis. One case was diagnosed using Mesenteric cold abscess aspirate, and one was diagnosed using peritoneal specimen. Most common pathological diagnosis was that of Hyperplastic type of intestinal Tuberculosis, in 64% of cases, of which 21 presented with features of intestinal obstruction and 9 presented with mass per abdomen. Ulcerative type of intestinal Tuberculosis was found in 11 cases, five cases had ileal perforation, nine presented with intestinal obstruction,

of which one had jejunal stricture and rest had ileal strictures and one case presented as mass per abdomen. Peritoneal involvement was seen in only one case which was a case of plastic type of Tubercular peritonitis. Ascites type seen in four cases.

Site	Pathological type	Number	Percentage
Intestine	Hyperplastic	32	64
	Ulcerative	11	22
Peritoneal	Ascites	4	8
	Plastic	1	2
Mesenteric nodes		20	40

**Table 9. Histopathological Diagnosis**



*Barium study – Ileal stricture*



*CXR showin b/l TB & air under diaphragm*



*TB of appendix*



*Ileocaecal TB*



*TB ileal perforation*



*Mesenteric LN enlargement*



*Burst abdomen*



*Abdominal cocoon*



*Feecal fistula*

## DISCUSSION

Tuberculosis is still a highly prevalent disease in India like other developing countries of the world where malnutrition, overcrowding and poor sanitary conditions exist. Abdominal tuberculosis also represents a relatively common health problem. Many a times laparotomy and histopathological examination is needed to establish the diagnosis. In this series 50 cases of abdominal tuberculosis with various symptoms and signs have been reported. The main focus of this study was the clinical manifestation, diagnosis and surgical treatment of patients with Abdominal Tuberculosis. The results are analysed in comparison to various studies done on Abdominal Tuberculosis.

### Age Incidence

Age (yrs.)	Bhansali. S K <sup>6</sup> (310)	Forrest C et. al (137)	Kailash Charokar (72)	Present Study
15-20	16%	20%	24%	14%
21-30	41%	38%	27%	36%
31-40	25%	20%	19%	24%
41-50	13%	15%	18%	18%
51-60	5%	7%	12%	8%

**Table 10. Comparison of Age Incidence with Other Studies**

Maximum incidence (36%) seen in 21 - 30 years age group in present series, while in other series Bhansali.S.K<sup>6</sup>, Forrest C et al<sup>16</sup> and Kailash Charokar et al<sup>17</sup> reported maximum incidence in 21 - 30 age group shows 41%, 38% and 27% respectively. Next 31-40 years shows 24% comparable with Bhansali.S.K<sup>6</sup> and Forrest C et al.<sup>16</sup> 74 % cases were in 2nd, 3rd and 4th decades of life in the present study, while Bhansali.S.K<sup>6</sup> reported 82% in the same age group, while Forrest C et al<sup>16</sup> and Kailash Charokar et al<sup>17</sup> reported 78% and 70% respectively in the same age group.

### Sex Incidence

In the present series the M: F ratio was 1.63: 1, while Bhansali. S.K<sup>6</sup> reported a ratio of 1:1, while Forrest C<sup>16</sup> et al reported a ratio of 1.28:1, Kailash Charokar et al<sup>17</sup> reported of 1.57:1.

Studies	Male	Female	Ratio
Bhansali.S.K <sup>6</sup>	150	160	0.93: 1
Forrest C et al <sup>16</sup>	77	60	1.28: 1
Kailash Charokar et al <sup>17</sup>	44	28	1.57: 1
Present study	31	19	1.63: 1

**Table 11. Comparison of Sex Incidence with Other Studies**

### Symptomatology

Pain abdomen was the commonest symptom in the present study, present in 90% of cases. In Forrest C et al<sup>16</sup> series, it was present in 86% of subjects, while in Kailash et al<sup>17</sup> series it was present in 97% of subjects. Altered bowel habits were the second most significant complaints in the present series, 52% cases had it as a presenting complaint. Forrest C et al<sup>16</sup> reported it to be present in 50% of cases, while Kailash et

al<sup>17</sup> reported the symptom in 37% of cases in both the studies it was the second most common presenting complaint. The other common symptoms in the present series and series by Forrest C et al<sup>16</sup> and Kailash et al<sup>17</sup> were distension, vomiting, mass per abdomen, fever and anorexia with weight loss.

Symptoms	Forrest C et. al <sup>16</sup> (137)	Kailash charokar <sup>17</sup> (72)	Present study
Abdominal pain	86%	97%	90%
Altered bowel habits	50%	37%	52%
Abdominal distension	31%	80%	44%
Fever	29%	43%	28%
Vomiting	47%	81%	46%
Mass per abdomen	9%	32%	8%
Anorexia & wt. loss	10%	47%	30%
Menstrual irregularities	12%	13%	10%

**Table 12. Comparison of Symptomatology With Other Studies**

As the symptoms and signs of Abdominal tuberculosis are nonspecific and there is no unequivocal diag.

SIGNS	Forrest C et. al (137)	Kailash Charokar (72)	Present Study
Abd. Tenderness	28%	62%	56%
Abd. Distension	41%	43%	48%
RIF Mass	14%	23%	20%
Hyper peristaltic bowel sounds	14%	24%	18%
Rigidity	15%	37%	30%
Guarding	15%	37%	30%
Mass other than RIF	10%	8%	2%
No findings	3%	2%	4%

**Table 13. Comparison of Physical Findings with Other Studies**

### Diagnosis

Diagnosis is difficult because of vague symptoms and signs with no pathognomonic investigations. Das and Shukla<sup>18</sup> working in an endemic area reported that diagnosis was made only in 50% of cases. Forrest C et al<sup>16</sup> reported preoperative diagnosis was made in 69% of the cases. In the present study correct preoperative diagnosis was made in 50% of cases, diagnosis was more often correct in sub-acute intestinal obstruction or mass per abdomen, than in acute obstruction or atypical presentation.

### Operative Management

In the present study the most common procedure undergone was resection of small bowel 38% cases, primary anastomosis done in 24% cases and ileostomy done in 14% cases. Other common procedure undergone was mesenteric lymph node biopsy 36%. Compared to Forrest C et al<sup>16</sup> series



Stricturoplasty was the most common procedure of 26%, resection of small bowel was 22% cases and mesenteric lymph node biopsy was 13%. Kailash Charokar et al<sup>17</sup> study shows resection of small bowel in 26% cases, of these, primary anastomosis done in 14% cases and ileostomy in 12% cases.

Other procedures like Limited resection of large bowel and right hemicolectomy done in 16% and 4% cases respectively. In Forrest C et al<sup>16</sup> series Limited resection of large bowel and right hemicolectomy done in 13% and 8% cases respectively. Whereas in Kailash Charokar et al<sup>17</sup> study right hemicolectomy 20% and limited resection 14%. In present series small bowel perforation closure done in 10% cases, other studies Forrest C et al<sup>16</sup> series and Kailash Charokar et al<sup>17</sup> series 3% and 17% respectively. Adhesiolysis and release of bands done in 14% cases, appendicectomy in one case and drainage of abscess in one case.

When surgery is done, it must suite the pathological findings (Pujari<sup>19</sup>, 1979). Resection of an ileocaecal mass can be of a limited extent rather than the classical hemicolectomy because extensive resection of bowel can lead to malabsorption (Prakash et al, 1975) and strictures can be treated by stricturoplasty (Katariya et al, 1977) can be done even in emergency (Parikh). Perforations are best handled by resection rather than over sewing (Eggleston et al, 1983).

Procedure	Forrest C et. Al <sup>16</sup> (137)	Kailash Charokar <sup>17</sup> (72)	Present Study (50)
Stricturoplasty	26	6	10
Resection anastomosis	12	14	24
Resection ileostomy	10	12	14
Mesenteric In biopsy	13	26	36
Adhesiolysis	14	31	14
Perforation closure	3	17	10
Limited resection	13	14	16
Right hemicolectomy	8	20	4
Appendicectomy	-	-	2
Drainage of abscess	-	-	2

**Table 14. Comparison of Surgical Procedures with Other Studies**

#### Morbidity and Mortality

In the present series operative morbidity was 60%, most common complication being wound infection (56%). Wound infection is common (Pujari, 1979)<sup>19</sup> Forrest C et al reported a morbidity of 36%, while Kailash Charokar et al<sup>17</sup> study reported a morbidity of 29%. Other complications are paralytic ileus, pulmonary complications, enterocutaneous fistula and wound dehiscences are noted and comparable with Kailash Charokar et al<sup>17</sup> study. Mortality in the present series was low, only one patient died (2%), who underwent emergency procedures and has pulmonary and cardiac complications and no deaths were reported in elective cases. Only M.B. Islam et al<sup>20</sup> reported mortality lower than the present study, no cases died in their study. In Forrest C et al<sup>16</sup> series, it was 3% in elective surgery and 18% in emergency, while Bhansali S.K<sup>6</sup> reported it as 2% and 24%

respectively. Follow up with six months of anti-tubercular treatment gave excellent results in 90% of the patients after surgery.

#### CONCLUSION

The following conclusions can be drawn from the study.

- 1) The signs and symptoms of intestinal tuberculosis are nonspecific, and there are no unequivocal diagnostic features either clinically or radiologically. The most common presenting complaint was abdominal pain and the most common sign was abdominal tenderness. As a result, laparotomy and histopathological examination were frequently necessary to establish confirmatory diagnosis.
- 2) Incidence of GI tuberculosis is almost the same in either sex, with a slight male predominance. It commonly affects the adults in their 3rd and 4th decades. Notably the earning age group hence can have economic implications. Also, females are affected at slightly younger age than males. The M: F ratio in the present series was 3:2
- 3) Patients commonly present with one of the complications and the most common among them is intestinal obstruction. Patients who present with a mass are of slightly higher age group and those presenting with a perforation are relatively younger.
- 4) Early diagnosis is the key factor in avoiding systemic and local complications of intestinal tuberculosis. Hence a high index of clinical suspicion is needed. It was more difficult in cases of emergency laparotomy, the nature of the obstruction may go unrecognized, particularly in patients having acute symptoms, or caecal masses may be thought to be malignant. The most common diagnosis made was that of Sub-acute intestinal obstruction (40%).
- 5) The approach to surgery should be conservative, with the aim of saving maximum bowel length, so Stricturoplasty and anastomosis were the most common surgeries performed (34%) in the present series. A definitive procedure in the form of resection of diseased segment and primary anastomosis has done. But in presence of gross peritonitis, a two-stage procedure with a temporary ileostomy is preferable and safe. While other procedures like perforation closure, adhesiolysis, limited resection and right hemicolectomy are done.
- 6) Wound infection is common, but most of them respond well to Anti Tubercular Treatment (ATT), so all patients should be started on 6 months of ATT, post operatively. Mortality is only 2%.

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