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CLINICAL STUDY OF ABDOMINAL TUBERCULOSIS, ITS PRESENTATION, INVESTIGATION AND MANAGEMENT

General Surgery

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ABSTRACT

INTRODUCTION - Abdominal tuberculosis is defined as infection of the peritoneum, hollow or solid abdominal organ with bacterial etiological agent mycobacterium tuberculosis. It continues to represent a diagnostic challenge to clinicians. Abdomen tuberculosis is involved in 10%-30% of patients with pre-exist pulmonary TB. Tuberculosis of the gastrointestinal tract is the sixth most frequent form of extra-pulmonary site.
AIMS AND OBJECTIVES - To study the clinical presentation of patients of abdominal tuberculosis. To evaluate various modalities involved in diagnosis of these cases and to study the therapeutic procedures (surgical or non surgical) in managing patients of abdominal tuberculosis.
MATERIAL AND METHODS - This study was conducted in the Department of General Surgery from Jan 2019 to Dec 2020. 48 patients who presented with clinical diagnosis of abdominal TB were enrolled into the study. All patients were treated either surgically or non-surgically by anti-tuberculosis therapy.
RESULTS - Young adults between 24-40 years were most commonly affected comprising of 50% cases. Male: female ratio was 2.2:1. 85% cases presented with obstructive symptoms, out of which 75% cases had sub acute obstruction. Pain abdomen was the commonest symptom. Release of band and adhesions 12 (48%), segmental resection of the diseased segment and anastomosis or stricturoplasty 4 (16%), ileo-transverse anastomosis including right hemi-colectomy 3 (12%), exteriorization of the perforation loop or ileostomy 5 (20%), repair of the perforation 5 (20%) and exploration with biopsy 3 (12%) cases.
CONCLUSION - Abdominal tuberculosis constitutes a major public health problem in our environment and presents a diagnostic challenge requiring a high index of clinical suspicion. Early diagnosis, early anti-tuberculous therapy and surgical treatment of the associated complications are essential for survival. In patients, who were managed conservatively, diagnosis was made on the basis of clinical evaluation, radiological imaging other investigation of ascitic fluid analysis.

KEYWORDS

Abdominal tuberculosis, Peritoneum, Radiological imaging.

INTRODUCTION

Tuberculosis caused by Mycobacterium tuberculosis is a disease of great antiquity and for a long time it has maintain its evil reputation and being one of the greatest killer disease of the mankind. Tuberculosis detected as far back as 10000 BC, still remain a major public health problem worldwide[1].

Abdominal tuberculosis is defined as infection of the peritoneum, hollow or solid abdominal organ with bacterial etiological agent mycobacterium tuberculosis. It continues to represent a diagnostic challenge to clinicians[2]. Abdomen tuberculosis is involved in 10%-30% of patients with pre-exist pulmonary TB[3].

Tuberculosis of the gastrointestinal tract is the sixth most frequent form of extra-pulmonary site, after lymphatic, genitourinary, bone and joint, miliary and meningeal tuberculosis[4].

The diagnosis is thus difficult and often delayed. Surgeons must be aware of the wide clinical spectrum of abdominal TB and have a high index of suspicion when confronted with patients from an endemic area presenting with unclear abdominal symptoms[3,5].

The clinical symptoms and signs of abdominal TB are non-specific and the diagnosis may be overlooked. The clinical picture is different in children to that in adults. About 90% of the features of abdominal TB in children are due to involvement of the peritoneum and lymph nodes and 10% related to intestinal lesions[4,5].

The most common signs are abdominal tenderness and hepatosplenomegaly. Patients with the "plastic" type of peritoneal TB may have a characteristic "doughy" abdomen in presentation[6]. Usually the onset of tuberculous peritonitis is insidious with fever, anorexia and weight loss. In a high prevalent area in tropical country the common presenting symptoms and signs were abdominal pain 76.6%; ascites 59.6%; weight loss 53.2% and fever 29.8%.[7]

Ultrasound scans of abdomen were abnormal in 68%, showing ascites, hepatomegaly and enlarged nodes. Computed tomography (CT) was the highly sensitive imaging modality (88%) in the abdominal tuberculosis and also contribute to diagnosis of abdomen tubercular pathology. The findings suggestive of abdominal TB were mesenteric/omental stranding (50%), ascites (37%), and retro- peritoneal lymphadenopathy (31%)[8].

The treatment of abdominal tuberculosis is mainly conservative (non-operative) with anti-tuberculous therapy and surgical treatment is reserved for complicated abdominal tuberculosis such as intestinal obstruction and bowel perforation with peritonitis.

Surgery is essentially reserved for those with acute surgical complications including free perforation, confined perforation with abscess or fistula, massive bleeding, complete obstruction, or obstruction not responding to medical management[5,9-11].

The surgery performed in gastrointestinal TB are essentially of three types.

(1) The first type is the surgery which is done to bypass the involved segments of bowel such as distal ileal and ileocaecal region procedure like enteroenterostomy or an ileotransverse anastomosis bypass surgery.
(2) The second type are segmental resections such as the limited ileo-caecal resection for obstructing ileo-caecal TB with adjuvant anti-tuberculous therapy to eradicate the disease completely[12,13].
(3) The third type of surgery is bowel conserving strictureplasty of those stenotic lesions with obstructive symptoms[12].

AIMS AND OBJECTIVES

1. To study the clinical presentation of patients of abdominal tuberculosis.
2. To evaluate various modalities involved in diagnosis of these cases.

3. To study the therapeutic procedures (surgical or non surgical) in managing patients of abdominal tuberculosis.

MATERIAL AND METHODS

This prospective study was conducted in the Department of General Surgery RNT Medical College, Udaipur from Jan 2019 to Dec 2020. 48 patients who presented with clinical diagnosis of abdominal TB were enrolled into the study. The criteria for diagnosis of abdominal TB.

INCLUSION CRITERIA

1. Patients included in the study group were of age >12 year of both gender who are diagnosed as abdominal tuberculosis on the basis of clinical presentation, radiological or operative and histopathological diagnosis of tubercular abdomen pathology enrolled into the study after a written informed consent to participate in the study
2. Abdominal tuberculosis disease complication such as lump abdomen, intestinal obstruction and tubercular ascites were included in this study.

EXCLUSION CRITERIA-

1. Patients who failed to given proper history and consent for the study.
2. Age below 12 year.
3. Pregnancy with abdominal tuberculosis.
4. Other exclusion criteria

I. Other than tubercular lump
ii. Other pathology of ascites

The criteria for diagnosis of abdominal tuberculosis were clinical suspicion, laboratory findings, operative findings, proven histologically, demonstration of AFB and response to anti-tuberculosis drugs. In all cases, assessment was done by detailed history and physical examination and relevant investigations.

Routine blood investigations including complete hemogram, renal function tests, ESR, LFT were done. Radiological investigation like X-ray chest and abdomen, USG whole abdomen, CECT abdomen and pelvis, Barium study were done as per indications, culture and staining etc. In case the patient undergoes surgical procedure, histopathological evaluation with biopsy specimen taken during surgery were performed.

All patients were treated either surgically or non- surgically by anti - tuberculosis therapy. The operations were performed either by the elective and emergency operation theatre and in operative cases intraoperative tissue biopsy was taken for histopathological evaluation for diagnosis.

All the patients were put on ATT either for 6 month or 12 months duration under DOTS Cat-1 of RNTCP and combination drug therapy of first line antitubercular drug included Isoniazid, Rifampicin, Pyrazinamide and Ethambutol or Streptomycin. All patients had been managed as pathological presentation.

The following Data of each patient for the study which includes socio-demographic (i.e. age sex, occupation and area of residence), clinical presentation, radiological findings, operative finding during surgery and the surgical procedure performed, course of treatment & postoperative complications, hospital stay and outcome are included into a proforma prepared for the study. Patients were followed up for a period of up to 6 to 9 month irrespective.

Data analysis was done with help of computer using epidemiological information package (EPI 2010) developed by center for disease control. Using this software range, frequencies, percentage means were calculated and compared with other studies.

OBSERVATIONS

Table 1: X-ray FPA findings

Inference	Total	Percentage (%)
Multiple fluid levels	30	62%
Dilated bowel loop	42	88%
Gas under diaphragm	5	10%

X-ray FPA was done in all 48 cases, most common finding in patient with obstructive symptoms was dilated bowel loop in 42 (88%) case followed by multiple air fluid level were seen in 62% cases which suggested, intestinal obstruction, sabacute or otherwise.

5 cases of generalized peritonitis had gas under diaphragm as an evidence of intestinal perforation.

Table 2: Finding of abdominal ultrasound examination (Done in 28 cases)

USG findings	Total	Percentage (%)
Free fluid	9	32
Dilated loops and thick bowel	24	86
Nodes	3	10

In present study abdominal ultrasonography was done in 28 cases out of which 86% cases have dilated and thick bowel loop as the most common finding on ultrasound examination. Other finding include in 32% and lymphadenopathy in 10% of cases.

DISCUSSON

The main focus of this study was the epidemiological observation, clinical manifestation, diagnosis and surgical treatment of patients with intestinal tuberculosis. The results were analysed and compared to various studies done on abdominal tuberculosis.

Age Incidence:

Age group	Seema Awasthi et al (2015)	Kiran arjun et al (2016)	Jawahar Krishnaswami et al (2017)	Chalya et al (2013)	Present study
<20 years	19%	10%	16%	6%	17%
20-40 years	56%	60%	55%	65%	50%
>40 years	25%	30%	29%	29%	33%

Abdominal tuberculosis can affect any age group but was most commonly seen in young age group. Young adults between 24-40 years were most commonly affected comprising of 50% cases, which is similar to findings of Seema Awasthi et al[15] 56%, Kiran Arjun et al[14] 60%, Jawahar Krishnaswami et al[16] 55% and Chalya et al[17] 65% in the same age group.

Sex Incidence:

Studies	Male	Female	Ratio
Seema Awasthi (2015)	28	20	1.4:1
Bhumit patel (2017)	43	26	1.65:1
Kiran arjun et al (2016)	26	14	1.85:1
Present study	33	15	2.2:1

In the present study the male: female ratio was 2.2:1 as compared to 1.65:1 by Bhumit Patel[18] and 1.85:1 by Kiran Arjun et al[19]. While Seema Awasthi[15] reported a ratio of 1:41.

Clinical presentation

In our study 85% cases presented with obstructive symptoms, out of which 75% cases had sub acute obstruction, 10% had acute abdomen and10% bowel perforation.

Bhansali (1977)[12] however reported in his study 40.28% cases of acute and 48% cases of sub-acute type of obstruction in his study. On the contrary Dandapat et al. (1985)[19] reported 70% cases as acute de novo and 30% as acute on chronic. Obstructive symptom in abdominal tuberculosis can result due to various mechanisms including stricture, adhesions etc.

In this study 20% cases presented with perforation peritonitis. Peritonitis occurred in cases due to perforation of hollow viscera or caseation of mesenteric lymphnodes. On the contrary Bhansali (1977)[12], Kapoor (1998) and Dandapat (1985)[19] reported perforation perotinitis in 4.5% of their cases. Bhansali (1977)[12] reported a few cases of peritonitis due to ruptured caseous lymph nodes.

Symptomatology

Symptoms	Chalya et al (2013)	Sharma AC et al (2016)	Kiran arjun et al (2016)	Forrest et al (1983)	Present study
Pain	93.3%	92%	82.5%	86%	90%
Vomiting	79.7%	56%	20%	47%	48%
Distension	36.7%	62%		31%	44%

Altered bowel habit	30.5	59%	52%	50%	54%
Constitutional symptom	50	38%	47.5%	39%	31%
Menstrual irregularity		10.25%		12%	13%

Pain abdomen was the commonest symptom in the present study, present in 90% of cases. In Chalya et al[17] study it was present in 93.3% of subject, while in Forrest et al[20] series, it was present in 86% of subjects, in Kiran Arjun et al (2016)[14] present in 82.5% and in Sharma AC et al (2016)[21] reported 92%. Altered bowel habits were the second most significant complain in present series, 54% cases had it as a presenting complaint. Chalya et al(2013) reported it to be present in 30% of cases while Forrest et al reported the symptom in 50% of cases, Kiran Arjun et al (2016) reported 50% of cases and Sharma Ac et al (2016)[21] reported 59% of cases.

Other common symptoms in the present series and other series[14,17,20,21] were distension, vomiting, constitutional symptoms.

In this study tubercular abdomen symptom >6 months duration was present at the time of presentation. The late presentation in this study may be attributed to the fact that the diagnosis of abdominal TB in its initial stages is usually difficult due to vague and non-specific symptoms as a result patients remain undiagnosed and subsequently present late with complications such as intestinal obstruction and bowel perforation with peritonitis. Late presentation in this study may also be attributed to lack of accessibility to health care facilities.

Physical findings:

Sign	Forrest et al (1983)	Kiran Arjun et al (2016)	Sharma AC et al (2016)	Present study
Tenderness	28%	57.5%	69.2%	60%
Distension	41%	75%	62%	54%
Mass in RIF	14%	17.75	17.9%	23%
Hyperperistaltic bowel sound	14%	2.5%	17.95%	21%
Guarding	15%	7.5%	17.9%	13%
Rigidity	15%	7.5%	17.9%	13%

Abdominal tenderness was the most common sign in the present study was present in 60% of cases, while in Forrest et al 28%, Kiran Arjun et al[14] 57%, Sharma AC et al[21] 69.2%, abdominal distension was most common finding being present in 54% of subjects, distension was present in 41% cases in present Forrest et al, 75% in Kiran et al[14] series and 62% in Sharma AC et al[21]. Mass per abdomen was present in 23% of subjects in the present series, while it was present in in 14% of cases in Forrest C et al[20] series, 17.5% in Kiran Arjun et al and 17.9% in Sharma AC et al. Other finding of hyperperistaltic bowel sound, rigidity, guarding were comparable in both series. Table shows comparisons of physical finding with Forrest C et al series, Kiran Arjun et al.

Imaging study

The presumptive diagnosis of abdominal tuberculosis is based on radiological investigations. The chest X-rays, Ultrasound abdomen, Barium study and CT scan of the abdomen contribute to variable extent in making the diagnosis. In our series X-ray chest showed evidence of past or present tuberculosis in 18 (36%) cases which is in wide contrast with study of A Manohar (1990)[23] ,who found the positivity rate in 40.8% and 43.2% respectively. In Prakash's (1978)[24] series of 300 patients, no patient had active pulmonary tuberculosis but 39% had evidence of healed tuberculosis on X-ray. While findings of tuberculosis (active or healed) on chest X-ray support the diagnosis of abdominal tuberculosis, a normal chest X-ray does not rule it out. In the present study X-ray abdomen was done in all 48 (100%) patients and it showed dilated intestinal loops in 42 (88%) cases and air fluid levels in 30 (62%) cases.

In the present study, barium studies were done in 6 (12%) cases in out of 48 patients. In whom features suggestive of abdominal Koch's was found in 4 (66.6%) cases that show Barium study significant. Barium studies are sensitive for ileocaecal and colonic lesion. Tandon et al[25] reported false negative barium studies in 25% of patients. Although several subtle features on barium studies have been shown to be more consistent with ileocaecal tuberculosis, there is no particular feature, which enables one to diagnose gut tuberculosis confidently on radiology alone. The radiological differences of intestinal Tuberculosis and Crohn's disease have always been difficult. There are reports in which TB has mimicked Crohn's disease.

The ultrasonography gives useful supportive findings:- terminal ileum & caecal wall thickening, loculated ascites with free-fluid, interloop ascites producing 'sliced bread' sign, and mesenteric lymphadenopathy. Kedar and Shah[26] reported ultrasonographic findings in 90 Cases with abdominal tuberculosis in a period of one year. The lesions encountered were intestinal in 31, extra intestinal in 59, including ascites in 36 cases and lymphadenopathy in 23 cases.

In present study, USG was done in 28 cases. This aided in the diagnosis of 24 (86%) cases. CT scan was done in 15 cases and it suggested abdominal tuberculosis in13 (93%) cases. Although both abdominal US and CT are equally sensitive in detecting ascites, CT is superior to US in detecting lymphadenopathy, gut wall thickness, omental cake, and other abnormalities.

Radiological investigation is the mainstay in making presumptive diagnosis of abdominal TB, this include chest x-rays, ultrasound or CT scan of the abdomen and barium studies. Of all the radiological investigations, CT scan of the abdomen, which is a costly investigation, gives a better view of intestinal and extra intestinal structures. Diagnosis made on the basis of radiology is rapid, easy and less expensive but it is presumptive and cannot exclude completely other diseases like Crohn's disease and malignancies of solid abdominal viscera.

Management

Tuberculosis is essentially a systemic disease, for which a wide range of chemotherapeutic drug combination available. Tuberculosis should be managed conservatively, as far as possible. The aim of surgery in cases of intestinal tuberculosis is to overcome the deleterious effects of disease like tissue disorganization, obstruction and perforation.

The choice of surgical procedure depended on site and extent of disease, status of the remaining gut, general condition of the patient, surgeon's expertise and individual preference.

Procedure	Forrest C et al (1983)	Kiran arjun et al (2016)	Chalya et al (2013)	Present study
Resection anastomosis and stricturoplasty	18%	18%	26%	16%
Right hemicolectomy	12%	13%	6.6%	12%
Release of band and adhesion	20%	27%	58.5%	48%
Bowel perforation repair	5%	18%	8%	20%
Stoma (ileostomy)	18%	13%	0.5%	20%
Exploration and biopsy	1%		2.8%	12%

In the present study, various surgical procedures performed in 25 (52%) patients these are common procedure.; release of band and adhesions 12 (48%), segmental resection of the diseased segment and anastomosis or stricturoplasty 4 (16%), ileo-transverse anastomosis including right hemi-colectomy 3 (12%), exteriorization of the perforation loop or ileostomy 5 (20%), repair of the perforation 5 (20%) and exploration with biopsy 3 (12%) cases then along the above procedure specimen for HPE was taken.

In our series, release of bands and adhesions was the most frequent surgical procedure performed followed by segmental bowel resection with end-to-end anastomosis. Similar surgical treatment pattern was reported by other writers also. Stricturoplasty as the most common surgical procedure performed. As reported by others, anti-tuberculous therapy was prescribed in all the tubercular patients postoperatively.

In Forrest et al, Kiran Arjun et al (2016)[14] and Chalya et al study(2013)[17] resection and anastomosis in 18%, 18% and 26.6% and right hemicoletomy in Forrest et al[20] (12%), in Kiran Arjun et al (2016) 13%, in Chalya[17] (6.6%) and Release of band adhesion 20% in Forrest et al Kiran Arjun et al (2016) 27%, and 58.5% in Chalya et al and bowel perforation repair18%, 18% and 5.7 and stoma performed 18%, 13% and 0.5% and then exploration and biopsy done in 1% and 2.8% in Forrest et al and Chalya et al study.

Follow up

In this study, the overall median duration of hospital stay was 18 days

which is higher than that reported by other authors. After surgical procedure postoperative long hospital stay due to co-morbidity and patients belong to poor socioeconomic status and delay diagnosis and late hospitalized and curative management.

In this study, the follow up of our patients was generally poor and also lost to follow up. These issues are often the results of poverty, long distance from the hospitals and ignorance. Delayed presentation, after histopathological confirmation of abdominal tuberculosis then patient anti TB drug taken from nearest PHC/CHC and register under DOT's Cat 1.

However, despite these limitations, the study has pro- vided local data that can be utilized by health care providers to plan for preventive strategies.

CONCLUSION

Abdominal tuberculosis constitutes a major public health problem in our environment and presents a diagnostic challenge requiring a high index of clinical suspicion. Early diagnosis, early anti-tuberculous therapy and surgical treatment of the associated complications are essential for survival.

X-Ray flat plate abdomen showed dilated intestinal loops and air fluid level in many cases and few cases showed gas under diaphragm. USG abdomen, CT abdomen & pelvis Scan and Barium studies helped to clinical diagnosis.

Most common operative findings were Bands and adhesions, enlarged lymph nodes, strictures of intestine, macroscopic finding found scattered tubercles over bowel and peritoneum.

In patients, who were managed conservatively, diagnosis was made on the basis of clinical evaluation, radiological imaging other investigation of ascitic fluid analysis.

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