Gastrointestinal Tuberculosis: Retrospective Review of 86 Cases

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ABSTRACT:

BACKGROUND:

The aim of this study is to present our experience in the management of gastrointestinal tuberculosis in Iraq.

PATIENTS&METHODS:

86 cases with intestinal tuberculosis were histologically proven by endoscopy or surgery, during the period 1965-2004 at the Medical City Teaching Hospital, & two private hospitals (Alousi & Mustansiria), Baghdad.

RESULTS:

54(62.8%) were female and 32(37.2%) were male. Age ranged from 6-82 years (mean 33yrs), peak 30-39 years. Clinical presentation were; intestinal obstruction 44(51.2%), abdominal mass 20(23.3%), malabsorption 13(13%), massive gastrointestinal bleeding 3(3.5%), peritonitis 3(3.5%), pyloric obstruction 2(2.3%) and dysphagia 1(1.2%) patients. Chest X-ray reported; normal in 62(72.1%), active pulmonary tuberculosis in 3(3.5%), and healed lesion in 21(24.4%) patients. Barium study revealed dilated bowel loops in 31(45.6%); other less frequent findings were strictures, filling defect, shortening and bowel irregularity. OGD showed a significant pathology in 7 out of 11 patients examined. Ultrasound showed helpful imaging modality in 15/21 patients; ascitis, masses, enlarged lymph nodes, and thick bowel loops in some cases. Site of lesions were; ileocecal 42(48.8%), small bowel 33(38.4%), colorectal 8(9.3%) and stomach 3(3.5%) patients. Gross appearance were hyperplastic 33(38.4%), ulcerative 20(13.9%), strictures 21(24.4), and mixed 12 (13.9%) patients. Surgical procedures were; right hemicolectomy 38(44.2%), resection of small bowel 23(26.7%), colectomy 4(4.7%), by-pass 4(4.7%), stricturoplasty 2(2.3%), and subtotal gastrectomy 1(1.2%) and biopsy only 14(16.3%) patients. One patient died post-operatively from pulmonary embolism, 6 lost to follow, 4 had relapse after stopped treatment within 3-5 months (one of them died from intestinal obstruction) while the result in those followed 74 (including 3 who relapsed and re-treated) patients whom received chemotherapy for over one year were very satisfactory.

CONCLUSION:

Gastrointestinal tuberculosis affects females more than males. No age is immune, peak in 3rd decade. Symptomatology is non-specific, it should be suspected in patients having abdominal pain, weight loss, anorexia, fever, ascites and abdominal mass. Sub-acute or acute intestinal obstruction is the most common presentation followed by abdominal mass or malabsorption in our study. Normal chest radiograph does not exclude the presence of abdominal tuberculosis, but it should be suspected in high ESR patients. Surgical interventions is not alternative to standard anti-tuberculous therapy

KEY WORDS: Gastrointestinal Tuberculosis, Mycobacterium.

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INTRODUCTION:

Although gastrointestinal tuberculosis (GI-TB) is declining in most parts of the world, it is still prevalent in developing countries including Iraq where it is a common health problem. [1] In recent years there has been an upsurge of GI-TB in the United States and Europe as a result of influx of immigrants and the AIDS epidemic. [2,3,4,5] Tuberculosis can affect any part of the gastrointestinal from the mouth to the anus. [6]

Pathogenesis:

Mycobacterium tuberculosis (MT) is the pathogen responsible for most cases of intestinal tuberculosis. In some part of the world cases caused by *M.bovis*, an organism found in dairy products, are still reported but uncommon human pathogen in western countries. Other "atypical" mycobacterium such as *M. kansasii* may produce a similar clinical and pathologic appearance of disease. [2]

The usual route of infection is direct penetration of the intestinal mucosa by swallowed organisms. [2]

Distribution of Disease:

The most frequent sites of intestinal involvement are the ileum and cecum (75% of cases) probably because of the increased physiological stasis, increased rate of fluid and electrolyte absorption, minimal digestive activity and an abundance of lymphoid tissue at these sites. Other locations of involvement, in order of frequency, are the ascending colon, jejunum, appendix, duodenum, stomach, esophagus, sigmoid colon, and rectum. Multiple areas of the bowel can be affected. [2,6]

Pathological Classification :

The gross appearance of GI-TB can be classified into the following:

1- Ulcerative lesions are seen in 60% of patients, often in malnourished patients. [2] These lesions is highly virulent and in the past was associated with a high mortality rate. Predominantly it affect the terminal ileum where multiple deep transverse ulcers develops with its long axis perpendicular to the lumen, these may cause bleeding or extend to the serosa and may give rise to perforation .The serosal surface is thickened and studded with tubercles. Healing may result in multiple strictures with intervening normal and dilated segments of ileum (skip-lesions) similar to Crohn's or intestinal Lymphoma. [1,7,8]. Bacterial overgrowth may develop at this stage and cause diarrhea and malabsorption. [1,9]

2- Hypertrophic lesion occurs in 10% of patients, generally regarded as a low-virulence infection in a high degree of immunological resistance from previous exposure to MT.[2] Predominantly it affects the ileocecal region but it can also involve the ascending and transverse colon. It characterized by the absence of gross caseation but with marked thickening of the submucosal and subserosal layers resulting from chronic inflammation of lymphoid follicle .It manifests as scaring, fibrosis, and heaped-up mass lesion that mimic carcinoma. [9] Untreated, sooner or later subacute intestinal obstruction will supervene often together with the impaction of an enterolith in the narrowed lumen. [6

3- Ulcero-hypertrophic lesion are seen in 30% of patients, and in this type, mucosal ulceration are combined with healing and scar formation. [2,10]

Clinical Features:

Only some patients with GI-TB have specific symptoms. The most common complaint is chronic abdominal pain, which is non specific in character and is reported in 80-90% of patients. Weight loss, fever, night sweat, diarrhea, or constipation, and blood in the stool may be present.[2] An abdominal mass, usually deep and posterior in the right lower quadrant of the abdomen, can be detected in approximately two thirds of patients. Ascites may be present in some. Perforation is uncommon but can occur even during treatment**.** [2,11]

Diagnosis:

The diagnosis of abdominal tuberculosis can pose difficulties even in endemic area. [9] The definitive diagnosis of GI-TB is made either by direct visualization with an acid-fast stain which show the organisms as slender red rods or by culture of the mycobacterium from gastric washings, faeces, peritoneal fluid and tissue biopsies including enlarged peripheral lymph nodes, or by a polymerase chain reaction assay which can be used on endoscopic biopsy specimens or in fecal sample to diagnose intestinal tuberculosis. [2,12,13] Ascitic fluid examination show straw colored fluid with high protein, predominantly lymphocytic cells and adenosine deaminase levels above 36 U/L. (Which is a major advance in diagnosis) [2,14]

The tuberculin skin test is less helpful especially in countries where BCG vaccination has been widely used because a positive test does not necessarily mean active disease.

Plain radiographs of the abdomen may show extensive calcification .Barium studies show features of a thickened mucosa with distortion of the mucosal folds, ulcerations, pseudopolyp formation, varying degrees of thickening, stenosis, dilated loops and altered motility of the bowel. [2,6,9]

Computed tomography may show:

1-preferential thickening of the ileocecal valve and medial wall of the cecum and extension to the terminal ileum.

2-massive lymphadenopathy with central necrosis.

3-The cecum is contracted with disease on both sides of the valve, and the valve itself is often distorted and incompetent; conification of the cecum, as seen in on

barium enema, is characteristic of tuberculosis and is referred to as *Stielin's sign*.

4-Tuberculosis tends to involve short segments of the intestine with stenosis and fistula formation similar to primary intestinal lymphoma or Crohn's.

5-In the hypertrophic form a mass can be seen that resembles a cecal neoplasm.

6-Calcified mesenteric lymph nodes and an abnormal chest film are other finding that aid in the diagnosis of intestinal tuberculosis.

The best diagnostic procedure is laparoscopy with peritoneal biopsy and sampling of the ascitic fluid when present.

In many instances however, the diagnosis is only made by laparotomy with subsequent culture and histology of resected intestine. An experienced surgeon may have a strong suspicion of tuberculosis, although the disease can simulate several other disorders. [2,6, 7,8,9,15,16,17]

Treatment:

In the absence of complications; intestinal obstruction, massive bleeding, perforation or suspension of malignancy the treatment is conservative with rest, adequate nutritional intake and anti-tuberculous chemotherapy which gives a high cure rate for gastrointestinal tuberculosis provided the pulmonary tuberculosis is adequately treated. [9]

There are no controlled studies to determine the optimal therapy or duration, but suggestion of a three-drug regimen or 4 drugs for a period of 9-12 months would be adequate treatment. . [2]

Obstruction and fistula formation were the leading indications for surgery. In the current era, most fistulas and ulcerative complications respond to medical treatment, but mass lesions associated with hypertrophic form still may necessitate an operative approach, because they can lead to luminal obstruction. Surgery also necessary for frank perforation, confined perforation with abscess formation, or massive hemorrhage occur. Because of its similarity to carcinoma or lymphoma of the cecum, undiagnosed ileocolic tuberculosis disease may prompt exploratory laparotomy.[2] Ileocecal resection and right hemicolectomy are now the standard operation for ileocecal disease and the result are excellent provided that chemotherapy is maintained for appropriately long period of time after surgery.[9] Colonoscopy has reduced the need for diagnostic laparotomy. For disease in regions other than ileum and cecum, segmental resection of the bowel with end to end anastomosis is performed .More recently stricturoplasty has been introduced to deal with fibrotic stricture again this must combine with chemotherapy after surgery. [9]

PATIENT & METHODS:

Study design:

Retrospective study

Study sample:

120 patients with abdominal tuberculosis were operated upon by the senior surgeon (Z R A) during the period 1965-2004, at the Medical City Teaching Hospital and two private hospitals (Alousi & Mustansiria) in Baghdad. Of those 86 cases were labeled as gastrointestinal tuberculosis while the remaining 34 were tuberculous peritonitis not included in this study. All relevant features were recorded, including patient's demographics, presentation and follow up.

Investigations included the hematological and biochemical laboratory studies, ultra-sonography and radiological examination including chest X-ray and barium follow through. Barium follows through and ultrasound were not done to most of the patients who present acutely to the emergency department.

Oesophagogastroduodenoscopy (OGD) carried out to 11 patients who were complaining from upper gastrointestinal symptoms most of them in the last 15 years when the endoscopic unit introduced to the mentioned above hospitals.

Surgical exploration of the abdomin was performed to all of our patients (except in one patient who diagnosed endoscopically) and operation was indicated either because of emergency nature of the cases or because of lack of diagnosis with malignancy suspicion, and the surgical procedure was either; resection of involved bowel with restoration of the continuity in the majority of the cases or abdominal exploration and tissue biopsy taking in others. By-pass surgery and stricturoplasty performed in few other cases successfully.

Gross specimens were examined; the site and type of lesion recorded then pieces taken from the bowel and mesenteric lymph nodes for histopathological examination. Sections were stained by hematoxylin and Ziel-Neelson stains.

In all cases the diagnosis was established by tissue examination. The presence of caseating granuloma and /or the demonstration of acid fast bacilli were considered diagnostic of tuberculosis. These finding were correlated with clinical and therapeutic response.

Postoperatively, all patients were given anti-tuberculous chemotherapy. Streptomycin was given

as daily injection of 1gm. for two week, every other day for another two weeks and then twice weekly for 12-18 months. In addition, PAS was given as 5-10gm daily and INH 200-300mg daily for a similar period.

The majority of our patients followed post operatively for long period 3-40years, only six were lost to follow.

Polymerase chain reaction, colonoscopy and laparoscopy not performed in this study because it was not available.

RESULTS:

The 86 cases were distributed according to population all over the country and between the two main races Arabs 71/Kurds 15, ratio 4.7/1 (ratio among normal population Arabs/Kurds in Iraq is 5/1). Age incidence range from 6-82 years (mean 33 years) with a peak between 30-39 years. 32 were males and 54 females, a ratio M/F 1/1.7 (table 1)

Table 1: Distribution of Age & Gender (86 patients)

Gender	< 10	10-19	20-29	30-39	40-49	50-59	>60	Total
M	2	3	5	9	6	5	2	32
F	1	8	12	14	10	6	3	54
Total	3	11	17	23	16	11	5	86

The main clinical presenting signs and symptoms were abdominal pain in 71 (82.6%) patients, weight loss in 70(81.4%), poor appetite in 53(61.6%). Abdominal distention, vomiting, abdominal mass, diarrhea, fever, melena, clubbing, and ascitis were encountered less frequently. Pain were colicky in 55 patients, and dull aching in 16 patients, diarrhea was reported in 32(37.2%) patients. The abdominal masses were in the right iliac fossa 21 patients, umbilical 6 patients, and other sites 6 patients. The duration of symptoms varied from few months to ten years. Peripheral lymph adenopathy and dysphagia were the least common sign and symptom just in 1(1.2%) patient (Table 2).

Table 2: Sign & Symptoms in 86 patients with Gastrointestinal Tuberculosis.

	No	%		No	%
Abd.pain	71	82.6	Diarrhea	32	37.2
Weight loss	70	81.4	Fever	13	15.1
Poor Appetite	53	61.6	Melena	9	10.5
Borborigmi	39	45.3	Clubbing	6	7.0
Abd.Distentin. (ladder pattern)	38	44.2	Ascitis	5	5.8
Vomiting	35	40.7	Lymph.Aden.	1	1.2
Abd.mass	33	38.4	Dysphagia	1	1.2

The clinical presentation varies greatly and may simulate many common abdominal conditions. The major presentation was intestinal obstruction in 44(51.2%) patients, and abdominal mass was the next in 20(23.2%), malabsorption in 13(13.1%), massive bleeding and peritonitis in 3(3.5%), pyloric obstruction in 2(2.3%), and lastly dysphagia was the least common clinical presentation just in 1(1.2%) patient (Table 3).

Table 3: Clinical presentation (86 patients).

	No	%
Intestinal obstruction	44	51.2
Abdominal mass	20	23.3
Malabsorption	13	15.1
Massive bleeding	3	3.5
Peritonitis	3	3.5
Pyloric obstruction	2	2.3
Dysphagia	1	1.2
Total	86	

Anemia (10 gm or less) was encountered in 29(23,7%) out of 86 patients and raised ESR in 51(89.5%) out of 57 patients examined.

Chest X-ray revealed active lesion in 3(3.5%) patients, healed lesion in 21(24.4%), and was normal in 62(72.1%) patients.

Barium study revealed one or more of the following abnormality in order of frequency: Dilated bowel loops, irregular colon, irregular terminal ileum, multiple small bowel strictures, shortening right colon, wide ileocecal angle, and filling defect in the stomach. The most common finding was dilated bowel loops in 31(45.6%) patients, while the least common finding was filling defect in the stomach in 3(4.4%) patients (Table 4). Figure 1,2,3.

Table 4: Barium study (68 patients).

	No	%
Dilated bowel loops	31	45.6
Irregular Colon (colon)	26	38.2
Irregular terminal ileum	22	32.4
Multiple S.B. strictures	21	30.9
Shorting Right Colon	12	17.6
Wide Ileocecal Angle	11	16.2
Filling defect in stomach	3	4.4

OGD was done for 11/86 patients who were suffering from upper gastrointestinal upset and the findings were as follows: one patient for each ulcerative lesion in lower esophagus, cardia, and antrum. Three patients with duodenitis, one nodular lesion of duodenum while no pathology was found in 4 patients.

Ultrasound of the abdomen was able to detect abnormality in some of the patients as thick wall bowel, ascitis, dilated or narrowed bowel loops, masses, and enlarged lymph nodes (Table 5). The most common finding was ascitis and thickening or narrowing of the affected terminal ilium. While inability to detect any abnormal pathology was in more than 25% of patients in whom ultrasound were performed.

Table 5: Ultrasound finding (21 patients).

	No	%
Thick wall, narrowed terminal ileum	4	19
Ascites	4	19
Rt iliac fossa mass, enlarged lymph nodes	3	14.3
Thick wall small intestine	2	9.5
Dilated loops (intestinal obstruction)	2	9.5
Normal	6	28.6
Total	21	100

The lesion were restricted to the small intestine in 33 (38.4%), the ileocaecal region in 42 (48.8%), colorectal in 8 (9.3%), and localized to the stomach in 3 (3.5%) patients.

Grossly the lesions were hyperplastic infilterating the ileocaecal region in 33 (38.4%), ulcerative in 20 (23.3%), strictures (healed ulceration) in 21 (24.4%), and mixed types in 12(13.9%) patients. Figure 4,5,6,7,8,9,10.

Microscopically, there were typical granulomas with central caseation, epitheloid cells, and surrounding by a cuff of lymphocytes. Langhan's giant cells were often present. The inflammatory process involved the mucosa and submucosa with frequent involvement of the mesenteric lymph nodes. These points helped to differentiate the lesions from Cronh's disease. Acid fast bacilli were demonstrated in 21(24.4%) of tissue sections.

Surgical resection was performed in majority of the patients (66 patients), by-pass in 4, stricturoplasty in 2, and just endoscopic biopsy only in one patient (Table 6). Resection was indicated in obstructive, bleeding, or perforating lesions, and when malignancy was suspected. Restoration of gastrointestinal continuity after subtotal gastrectomy was by gastro-duodenol anastomosis and after colonic resection by end to end anastomosis.

Table 6: Surgical Procedure in 86 patients with Gastrointestinal Tuberculosis.

	No	%
RT.Hemicolectomy	38	44.2
Resection of S.B	23	26.7
Exploration	13	15.1
Colectomy	4	4.7
By-pass	4	4.7
Stricturoplasty	2	2.3
Endoscopic Biopsy only	1	1.2
Subtotal gastrectomy	1	1.2

Regarding the result and follow-up of the patients, one patient (1.16%) died postoperatively from pulmonary embolism, 6(6.9%) were lost for follow-up, and 79 were followed from 3-40 years.

Four patients (4.6%) who stopped their anti-tuberculous chemotherapy after a few months, had relapse of tuberculous lesions in the bowel; one of them died of intestinal obstruction and the other three cured medically. All other patients who continued with their therapy as prescribed were considered cured subjectively and objectively.

DISCUSSION:

Current series of GI-TB patients without HIV have highlighted several important considerations. Female predominance was shown as one characteristic feature of GI-TB in several studies in the past and also evident in our current series with females contributing to 62.8% of all patients. Possible reasons

for female predominance apart from malnutrition, illiteracy, and poor access to health care facility may be contiguous spread from tuberculous salpingitis. [1,18,19,20] In contrast, a study from India showed 69.4% patients with GI-TB were male. [21,22] Regarding to the age incidence in our series is similar to most reports from the Middle and Far East. [1,20,23]

The signs and symptoms of abdominal tuberculosis are nonspecific. Delays in diagnosis often result in an increase in complications and mortality and the diagnosis primarily necessitate a clinical awareness of this serious health problem. [24,25,26] Gastrointestinal tuberculosis should be considered in any patient who has obscure abdominal symptoms, weight loss and lethargy. The clinical presentation of intestinal tuberculosis varies according to the stage of the disease in the bowel. In acute ulcerative phase, it may present as enteritis, bleeding from the gut or perforation, while in the chronic phase which is more frequent may present as a subacute or acute intestinal obstruction, abdominal mass, or with vague symptoms [1]. For these reasons, tuberculosis of the bowel may simulate many common diseases affecting the bowel. In Iraq and other Middle East countries, primary intestinal lymphoma (PIL) is the most important disease, which should be differentiated from intestinal tuberculosis. PIL presents usually as malabsorption, intestinal obstruction, abdominal masses, bleeding or perforation of the bowel and it is difficult sometimes to differentiate it from intestinal tuberculosis or Crohn's on; clinical, laboratory, radiological, and even at operation without histopathology[1,7,8]. Ileocecal tuberculosis should be differentiated from common condition such as appendicular mass, colonic malignancy, and Crohn's disease, the latter is rare in Iraq. [1]

The most frequent symptom of GI-TB at presentation was abdominal pain, which was present in 82.6% of patients in our study. Mid abdominal colicky pain represented intermittent small bowel obstruction was seen in 51.2% of patients these figures generally in line with most of other reports.[20,23,25,27] This highlight the non-specific nature of abdominal pain and common feature that is present in abdominal malignancy and Crohn's disease. [5,18] Other Signs and symptoms like weight loss, poor appetite, abdominal distention and abdominal mass observed were generally agree with those of other studies like Rustam Khan *et al* except that the percentage of our patients showing fever and ascites were the lowest for any series. [20,23,25,27]

In our series the differentiation between gastrointestinal tuberculosis and other diseases like Crohn's disease and solid abdominal malignancies is sometime extremely difficult on clinical and radiological grounds which include chest x-rays, ultrasound or CT scan abdomen and barium studies, because CT scan was not done, ultrasound and barium study again not done in all patients as well as finding were largely non-specific, so exploratory laparotomy and OGD with biopsy was the only safe method to establish the diagnosis. While in other reviews radiological investigation is the mainstay in making presumptive diagnosis (50-80%) of abdominal tuberculosis.[15,16,17]

In the present series the evidence of concomitant pulmonary tuberculosis on chest X-rays in 24 (27.9%) patients out of these 3 (3.5%) patients had features suggestive of active pulmonary tuberculosis. In the literature, associated active pulmonary tuberculosis is variable and is reported up to 29% [8,25,26]. The presence of active pulmonary tuberculosis or demonstration of acid fast bacilli in the gastric lavage in the suspected patient may favor the diagnosis of intestinal tuberculosis. [1]

The majority of patients in this review have Ileocecal involvement 42/86. This is in agreement with other reviews on GI-TB. [20,27] Relatively common involvement of terminal ileum in intestinal tuberculosis is due to either physiological stasis, large surface area of this part of the intestine, complete digestion of food and abundant lymph nodes in the region. [28] Gross appearance of intestinal tuberculosis in this study were mostly hypertrophic lesion (38.4%), while most of other series stress on ulcerative type as a commonest lesion. [10]

Surgery is indicated in most cases, either as diagnostic or therapeutic procedure, particularly when complication arises like intestinal obstruction which is the commonest acute clinical presentation and complication of intestinal tuberculosis, moreover this paper also recorded other less frequent acute presentations like massive bleeding, diffuse peritonitis and pyloric obstruction. Some studies also reported acute tuberculous appendicitis as well. [29,30]

Surgical resection although a life saving procedure in some cases, is not an alternative to anti-tuberculous therapy. [1] Surgery can relieve the patient's symptoms and accelerate the healing and cure, so it can improve the outcomes of treatment of this disease. [1,31] Extensive resection should be avoided in

surgical treatment of intestinal tuberculosis especially in children.[32] In our study the commonest operation performed was right hemicolectomy because of common ileocecal involvement, in the last few years stricturoplasty also performed successfully.

Response to standard anti-tubercular drugs was generally good in this series as in others.[18] The minimal period of anti-tuberculous chemotherapy was twelve months; and no evidence of recurrent tuberculosis was illustrated. Early termination of this therapy might be followed by a relapse of the disease, as happened in 4 out of 79 followed cases in our study. Many authors advocated therapeutic trial with anti-tubercular therapy but it should not be encouraged routinely as it may delay the diagnosis of malignancy, lymphoma and Crohn's disease. [4,20]

Mortality due to abdominal tuberculosis ranged from 8 to 50 percent in various series. A possible reason for increased mortality in operated patients may be due to late presentation and previous complications like malnutrition, perforation and sepsis.[20,21] In our series one patient died postoperatively.

In the past some authors like Hoon *et al* stressed the fact that the diagnosis of tuberculosis should fulfill the following criteria: a) histological evidence of typical tuberculous granuloma with central caseation; b) demonstration of acid fast bacilli; and c) proof that the organism is tuberculous bacilli by mean of culture and animal inoculation.[1,33] Later on other authors suggest that the diagnosis of tuberculosis of the bowel may fulfill one or more of the above criteria, especially in areas where tuberculosis is still a common conditions like Iraq and treatment trial can be given on clinical suspicion.[1,34] This opinion is shared by our pathologists who made the diagnosis largely by histology of paraffin-embedded sections, which typically revealed epithelioid granuloma with central caseous necrosis and acid fast bacilli were demonstrated in about 24% of tissue sections, although Muneef *et al*.[35] reported 68% of peritoneal biopsies were positive by smear/culture. Moreover in our patients the yield of demonstrating tuberculous granuloma was high because the specimen was taken either surgically or through OGD.

There are some limitations in this study, one of these limitations is the retrospective nature of the data set but it doesn't interfere with the objective of the study. Secondly, all tests were not done in every patient because each test is not indicated in every case as many of them were acutely presented. Colon and terminal ileum is the most common site of involvement in intestinal variety of tuberculosis and in this regard colonoscopic images and biopsies are supposed to be a quick and good diagnostic tool. In the present series, colonoscopy was not performed to be helpful in making diagnosis. Colonoscopy also helps in differentiating the colonic tuberculosis from Crohn's disease. [10,11] On the other hand, laparoscopic and percutaneous aspiration procedures are safe and may be useful for diagnosis in selected cases of intestinal and peritoneal tuberculosis. [23,32,36] In some series laparoscopy and colonoscopy with biopsy for histologic and bacteriologic study led to a definitive diagnosis in 66% of cases, obviating the need for exploratory laparotomy. [11,20] Last limitation is the use of Polymerase Chain Reaction(PCR), which is yet not a standardized method in the diagnosis of intestinal tuberculosis in our study, although PCR amplification of *Mycobacterium tuberculosis* in tissue or fecal sample shows sensitivity reaching 90% in some series. [12,13]

CONCLUSION:

Tuberculosis affects all parts of the gastrointestinal tract but mostly the terminal ileum and the ileocecal region. Females affected more than males. No age is immune but the peak in the third decade. Symptoms are variable and non-specific, it must be born in mind in patients having; abdominal pain, weight loss, fever, night sweat, anorexia, abdominal mass and ascites especially in endemic areas. The most common presentation is subacute or acute intestinal obstruction followed by abdominal mass or malabsorption in our study. Absence of pulmonary tuberculosis does not exclude gastrointestinal tuberculosis but should be suspected in high ESR patients. Abdominal ultrasound, barium follow through and endoscopy with biopsy will provide diagnostic criteria of TB. Surgical interventions is not alternative to standard anti-tuberculous therapy but improve and accelerate recovery of this disease and is indicated when complications arise. The respond to anti-tuberculous therapy is very well after surgery but relapse is likely in patients whom received incomplete chemotherapy.

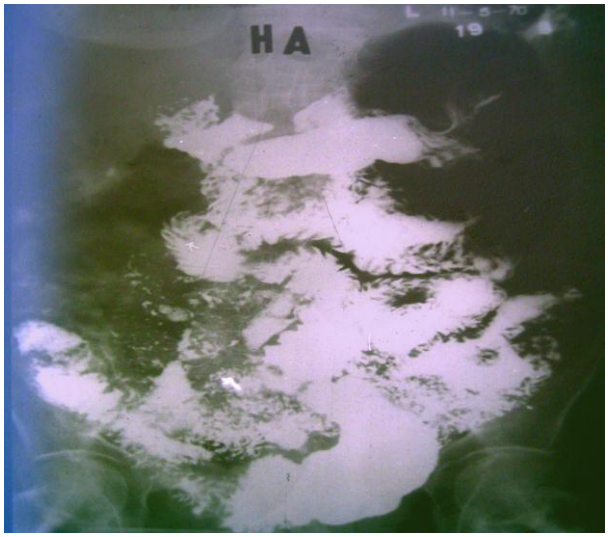

Figure 1: Barium follow revealing multiple stenosis of small bowel with dilated loops.

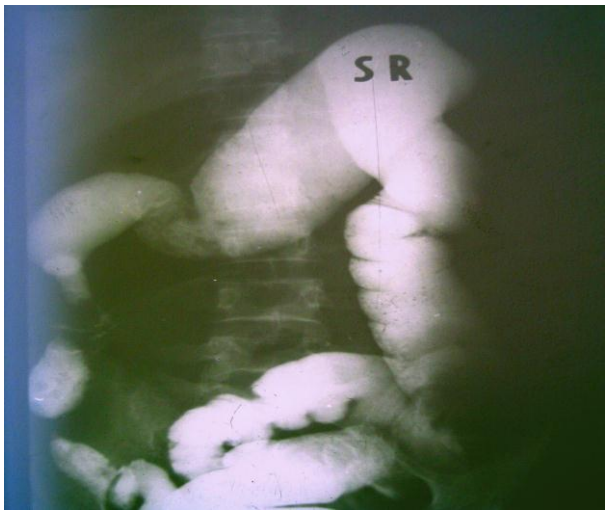

Figure 2: Barium enema showing narrowing and shorting of right colon and widening of the angle between the terminal ileum and ascending colon in hyperplasic ileocecal tuberculosis.

Figure 3: Barium enema of hyperplastic TB involving the transverse colon causing narrowing and shortening. With loss of haustration.

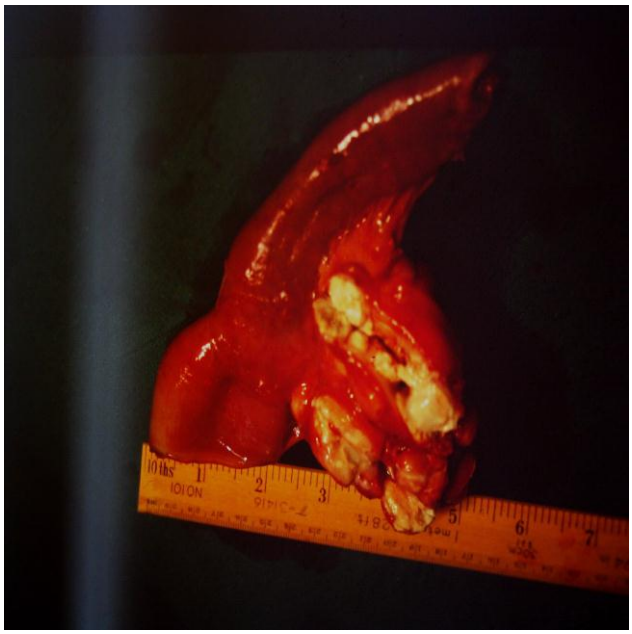

Figure 4: TB enteritis with stricture and enlarged, matted caseating mesenteric lymph nodes.

Figure 5: Open specimen of small bowel showing transverse ulceration with intervening normal mucosa.

Figure 6: Active and healed Tuberculous ulceration with stricture causing stenosis.

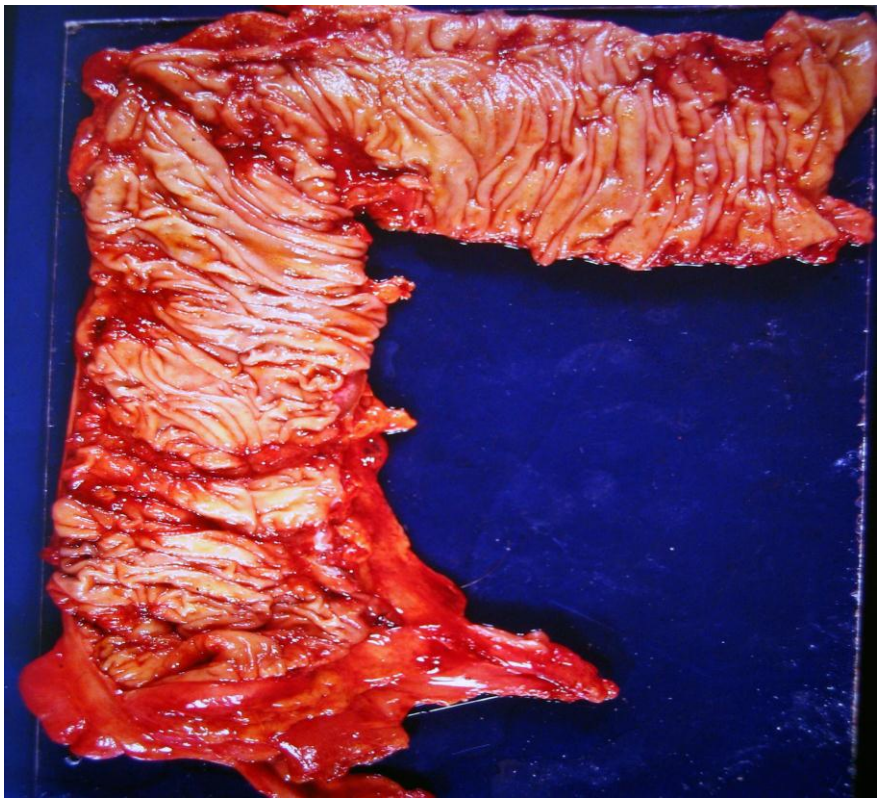

Figure 7: Extensive ulcerative TB involving the right colon.

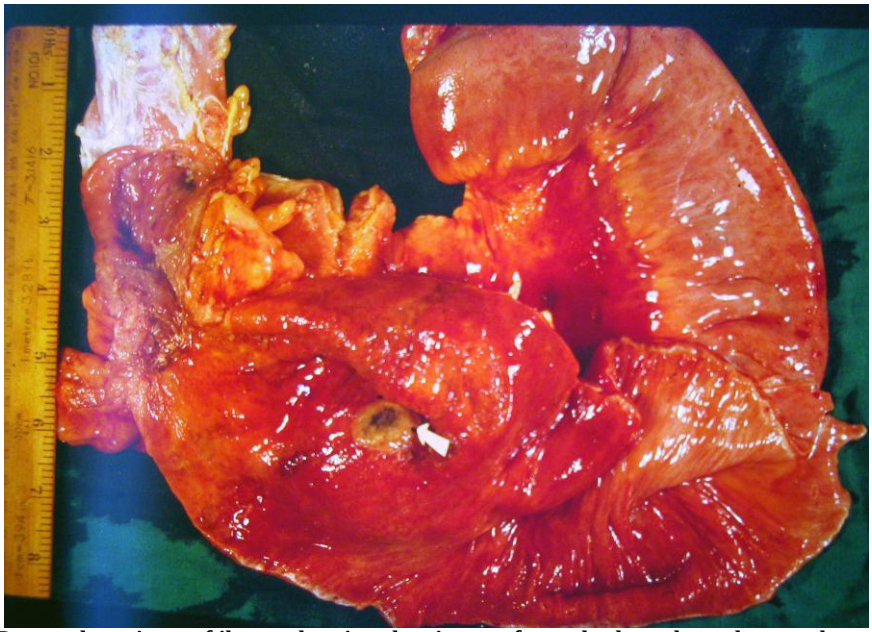

Figure 8: Resected specimen of ileocecal region showing, perforated tuberculous ulcer at the terminal ileum with stricture at the ileocecal valve and hugely dilated ileum.

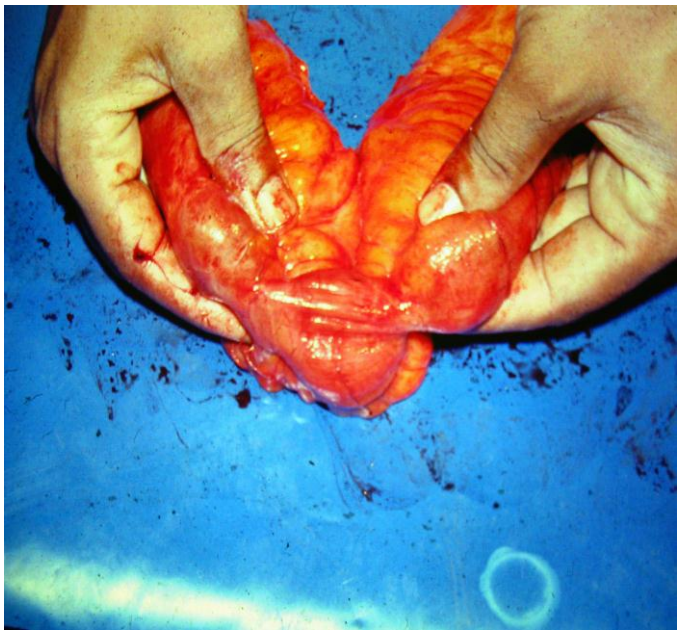

Figure 9: TB enteritis causing multiple strictures with three large enteroliths between the strictures causing intestinal obstruction.

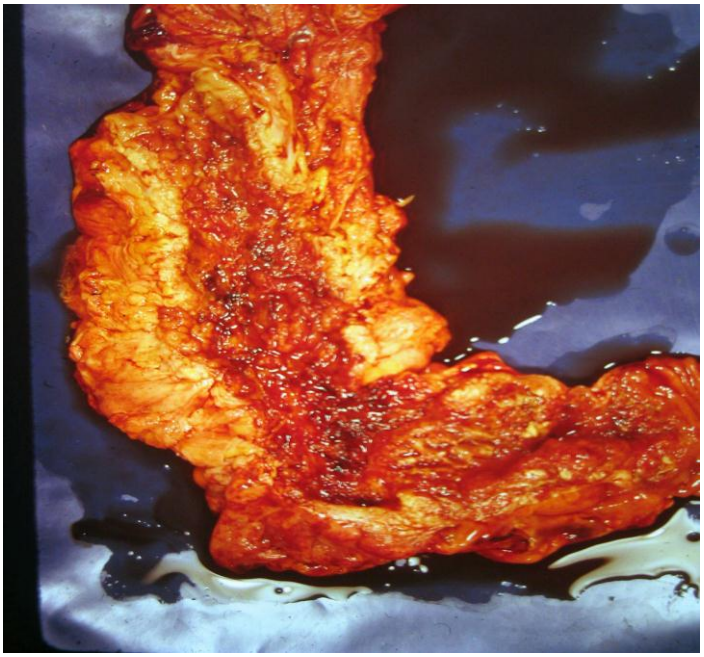

Figure 10: Resected specimen of hyperplastic ileocecal TB showing the thickened wall and narrowed lumen of the ileum and colon.

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