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# Diagnostic issues in abdominal tuberculosis

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# Diagnostic Issues in Abdominal Tuberculosis

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**Abstract**

**Objective:** To analyze the modes of presentation and diagnostic issues in the management of abdominal tuberculosis at a tertiary care hospital in a developing country, where most of the established diagnostic modalities are available.
**Setting:** The Aga Khan University Hospital, Karachi.
**Methods:** This study is a retrospective review of medical records of all inpatients, diagnosed to have abdominal tuberculosis, from January 1991 to December 1997. The data was collected and particularly analyzed for spectrum of presentation and role of various diagnostic modalities. Of special interest was the sub-group of patients, who after all investigations did not have a firm diagnosis. Following a literature review recommendations have been developed for empiric antituberculous therapy in such patients.
**Results:** A total of 135 patients were diagnosed to have abdominal tuberculosis with a mean age of 34 years and a male to female ratio of 1:2. Ninety-six (71%) patients presented with chronic abdominal symptoms, while 39 (29%) presented as an acute surgical emergency mandating exploratory laparotomy. A tissue-based diagnosis was established in 95 (70.30%) patients. while radiological diagnosis was made in 30(22.2%) patients. In 10 (7.4%) patients all investigations undertaken could not reveal a final diagnosis; these were treated empirically on the basis of a strong clinical suspicion.
**Conclusion:** The diagnosis of abdominal tuberculosis can be made confidently in most of the cases. There may be a small group of patients where diagnosis cannot be made despite appropriate investigations and a therapeutic trial of AU may be considered with close monitoring according to a pre-fixed protocol(JPMA 51:138:2001).

## Introduction

Tuberculosis is one of the earliest diseases known to mankind. In the 1 9th and 20th centuries, tuberculosis was seen as a common disease[1]. Despite the advent of cheap and effective drug therapy, the disease continues to be a major worldwide problem. According to the recent reports, seven to nine million new cases of tuberculosis are diagnosed each year worldwide[2].
Extrapulmonary forms of tuberculosis constitute approximately one sixth of all cases and the abdomen is the commonest extrapulmonary site of involvement3.The symptoms of abdominal tuberculosis are generally vague and nonspecific. It may mimic any intra-abdominal disease and can challenge diagnostic skills.Even in the areas where the disease is endemic, a correct diagnosis is made only in one half of the cases at the initial presentation[4].
This retrospective study aimed to analyze the mode of presentation and role of various diagnostic modalities in the management of abdominal tuberculosis. Of particular interest was the issue of empiric therapy on clinical suspicion in these cases, because of the potential of abuse in incompletely investigated patients leading to drug resistance on the one hand and missing other significant diseases on the other. Another concern was the lack of clear guidelines in literature about monitoring of empiric therapy once started.

## Material and Method

All adult inpatients with abdominal tuberculosis managed at the Aga Khan University Hospital, Karachi, between January 1991 and December 1997 were identified. After discharge all inpatients at this hospital have their diagnosis and medical/surgical care events abstracted onto a face sheet by the primary physician team. A team of qualified medical coding personnel converts the information to numeric codes according to the International classification of diseases 9th revision - clinical modification (ICD9-CM). The data is subsequently computerized. The medical records of these patients were analyzed retrospectively for demographic features, clinical presentation. mode of diagnosis. treatment offered and final outcome.

All patients fulfilled the diagnostic criteria fc' abdoni i nal tuberculosis, mentioned below[5]:
-a positive histopathology ( typical caseating granuloma)
-and/or demonstration of AFB on smear / culture
-and/or positive response to anti-tuberculosis therapy.
The radiological investigations were considered positive if the features were suggestive of the disease and the patient responded to AlT. The typical features of contrast studies included localized areas of irregular thickened folds, mucosal ulceration, dilated segments or strictures and deformed ileocaecal valve. The ultrasonograph ic features included low attenuation lym phadenopathy. ornenal or i leocaecal inflam m atoiy mass or peritoneal thickening with ascites. The tuberculin tesi was performed using 'monospot' and the reaction was considered significant when the largest diameter of induration was >10mm at 72 hours.
The patients, in whom both tissue and radiological studies were negative, were included only if the resolution of symptoms was documented in response to anti-tuberculous therapy.

**Results**

A total of 135 patients were managed at our hospital during the study period. Of these. 90 were females and 45 males with a female to male ratio of 2: 1. The mean age at to 80 years. and detailed presentation was 34 years with a range of 15 Mode of presentation is shown in Figure 1 symptomatology in Figure 2.

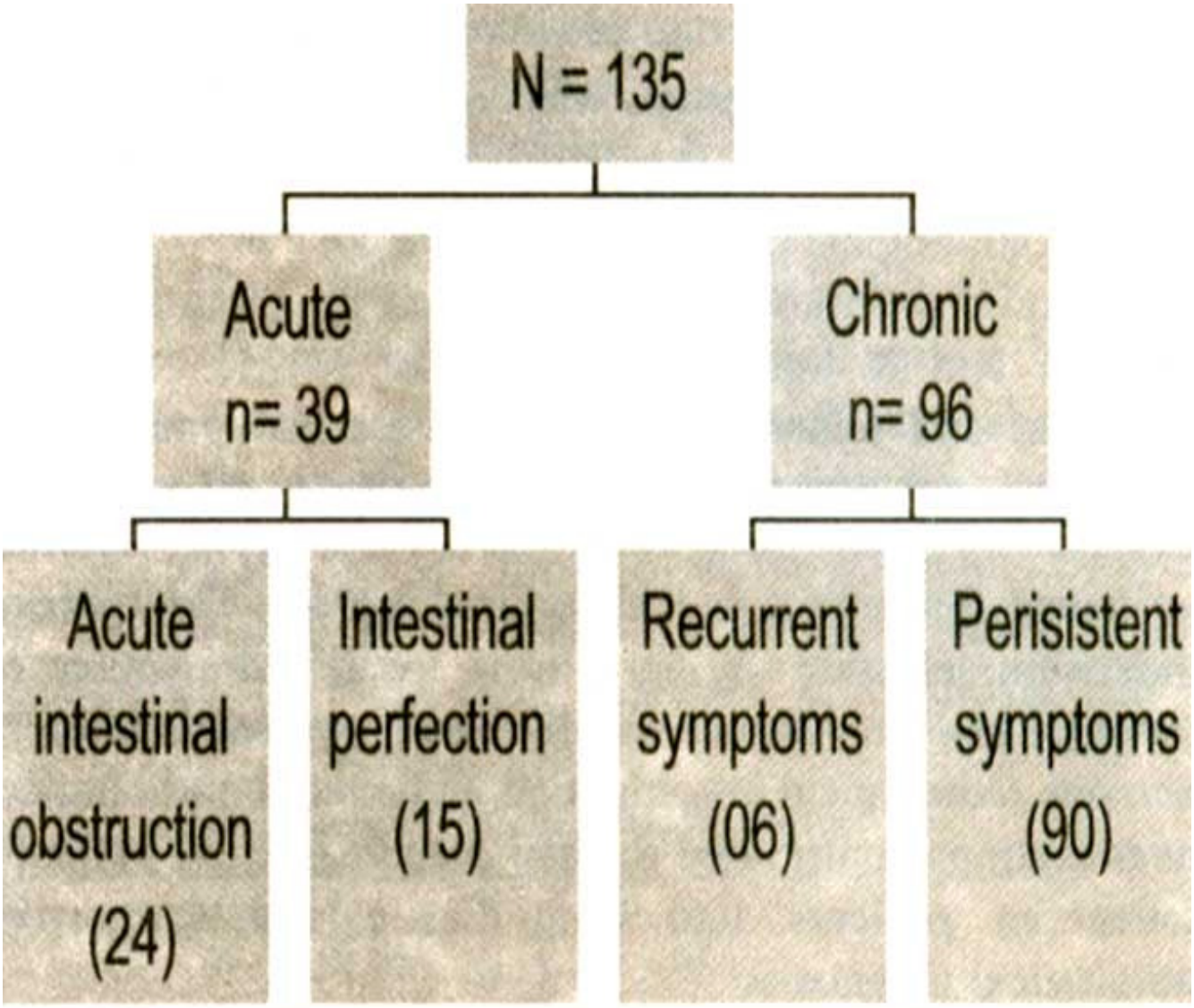
N = 135
Acute
n= 39
Chronic
n= 96
Acute intestinal obstruction (24)
Intestinal perfection (15)
Recurrent symptoms (06)
Perisistent symptoms (90)

Figure 1

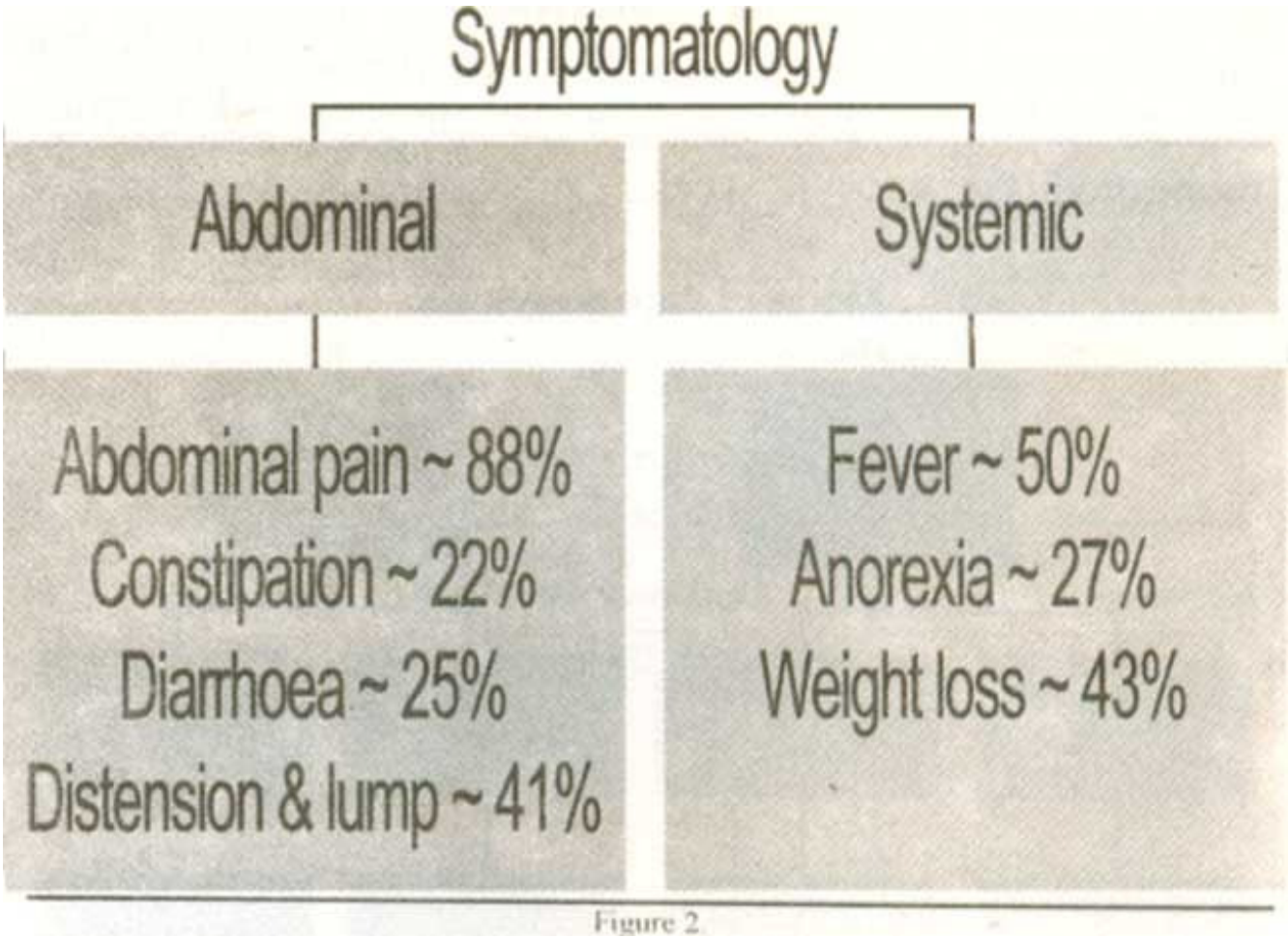

Figure 2

**Diagnostic modalities**

Tissue for diagnosis was obtained in l02 (75.5%) patients. The sources of tissue included laparotomy in 45. colonoscopy in 5 1 and diagnostic laparoscopy in 6 patients and the tissues were sent for both, histopathology and microbiology. Of the tissues subjected to histopathology, 84% had an evidence of granuloma formation while only 25% of the smears / cultures were positive for acid fast bacilli (AFB). The diagnosis was considered to be positive, if either of the above was positive. Ultimately, 95 patients had confirmed tissue diagnosis.

Radiological investigations were done in 57 patients. Small bowel enema was the commonest modality used (34 patients) and it was abnormal in 30 patients showing ileocaecal and jejunal abnormalities. Barium enema was done in 12 and was abnormal in 8 patients. CT scan and ultrasonography were carried out in 9 and 6 patients respectively and they revealed evidence of ascites, peritoneal thickening and abdominal masses. One patient underwent selective angiography to localize the source of lower GI bleeding unsuccessfully. Seven patients had more than one radiological investigation and overall, radiological investigations contributed to final diagnosis in 30 patients. Seventeen patients had both tissue and supportive radiological diagnosis.

In 10 patients, no definite diagnosis was made in spite of the appropriate investigations. Three of these patients were subjected to both tissue histopathology and radiology, while 7 had radiological investigations only, but the diagnosis was still not clear. On the basis of a strong clinical suspicion all were started on ATT and closely monitored for 4 to 6 weeks. A documented subjective improvement of the symptoms in response to ATT substantiated the diagnosis in these cases. The mode of final diagnosis is shown in Figure 3.

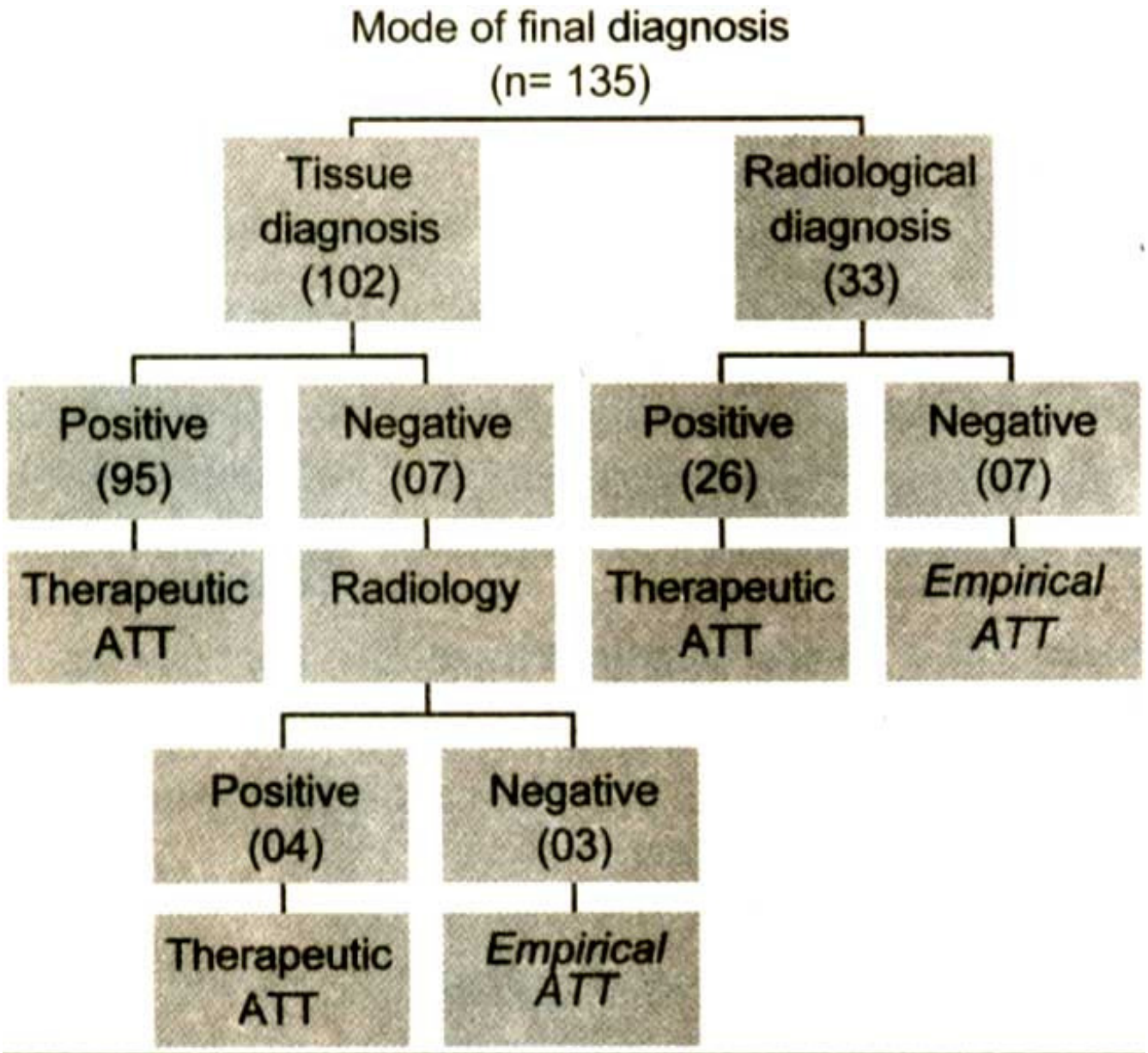


Figure 3. Final mode of diagnosis only. Seventeen patients had both tissue and radiological diagnosis, which are included in the 'tissue diagnosis' group.

A Mantoux test was done in 9 patients and was positive in 7 patients. A polymerase chain' reaction for mycobacterial antigen was done on serum of the patients in 15 cases and was positive in 9 patients.

**Management and Outcome**

Ninety patients were managed conservatively with standard anti-tubercu lous chemotherapy, while surgery was performed in 45 patients. indications for surgery were acute intestinal obstruction unresponsive to initial conservative management (24). bowel perforation leading to peritonitis (15) and recurrent intestinal obstruction (6).

lleocaecal region was the commonest site of involvement and was seen in 60% of the cases followed by peritoneurn, colon. jejununi, mesenteric nodes and liver. The mean hospital stay was 8.3 days with a range of I to 60 days. The median duration of follow up was 10 months. Ninety five percent of the patients were completely cured of their symptoms while 5% had some residual symptoms although they improved to some extent subjectively. Of the patients subjected to empirical therapy, 8 had a

follow up of more than 12 months while 2 patients did not comply after 6 months. All the patients had a positive response to ATT till the last follow- up. Overall mortality rate was 5.9°/o (8 patients). Causes of death included miliary tuberculosis in 2 and diffuse severe peritonitis with sepsis in 6 patients.

## Discussion

Tuberculosis continues to be a major health hazard throughout the world[6]. Extrapulmonary tuberculosis constitutes a significant proportion of these cases and presents a major diagnostic problem especially in the developing countries, where sophisticated medical facilities are scarce. Some studies also indicate that the incidence of extrapulmonary tuberculosis is higher in Asians than Caucasians[7]. In the developed countries as well, the pattern of tuberculosis is changing in favor of non-pulmonary tuberculosis[8]. We have made an attempt to analyze the diagnostic issues in the management of abdominal tuberculosis at a tertiary care hospital in a developing country, where most of the recent diagnostic modalities are available; including Bactec technique for culture and advanced radiological facilities.

Apart from tissue diagnosis, radiological investigations are the mainstay of diagnosis in abdominal tuberculosis[9]. Barium studies are helpful in the diagnosis of intestinal tuberculosis, but distinction from Crohn's disease and neoplasia can be difficult[10]. The typical appearance of colonic tuberculosis on double contrast barium enema is of shallow ulcers with elevated margins, which may coalesce to form annular lesions, localized areas of irregular, thickened folds, mucosal ulceration, dilated segments and strictures may be seen. The terminal ilem and ileocaecal valve are frequently involved, the latter maybe deformed and incompetent[1,12]. Crohns disease is a rare entity in our region, these radiological features would be considered in favour of intestinal tuberculosis[12].

The characteristic ultrasonograph ic findings of abdominal tuberculosis are low attenuation lymphadenopathy, and omental or ileocaecal inflammatory mass. Peritoneal thickening and ascites can also be detected frequently[13]. The most useful findings are fine fibrinous strands, membranes or debris in ascitic fluid, localized ascites and casceous or calcified lymph nodes. CT scan is better than ultrasound for showing high-density ascites and caseous necrosis of lymph nodes[14].

Colonoscopy and biopsy may establish a diagnosis in about 80% of cases of ileocaecal or colonic tuberculosis[15]. The characteristic features of colonic tuberculosis are mucosal ulcers and nodules with and without strictures. Laparoscopy is safe in the presence of ascites, with a positive diagnosis rate of upto 85%[12,16]. However; it should be used with caution in the presence of fibroadhesive peritoneal tuberculosis because of the risk of bowel injury.

Other diagnostic modalities mentioned in the literature include peritoneal biopsy using Abram's or Cope's needle or open peritoneal biopsy under local anesthesia[17]. Culture of the ascitic fluid has been positive in about 83% of the cases but requires at least one liter of fluid to be worthwhile[14]. Ascitic fluid adenosine deaminase (ADA) with a cutoff level of 32 units per liter has a sensitivity of 93% and a specificity of 96% for tuberculosis[14]. An enzyme linked immunosorbant assay (ELISA) of ascitic fluid, pleural fluid and serum has also been used to detect saline extracted mycobacterial antigen. Using serum, the sensitivity has been found to be 80% in abdominal tuberculosis with 93% specificity. This test has also been found useful for distinguishing tuberculosis from Crohn's disease[18]. These techniques are relatively safe but may not be completely reliable and are prone to both false-negative and false-positive results[19].

Management problems arise when most of the above investigations are either negative or sophisticated laboratory facilities are not available, both the issues can be compounded further by the need for urgent treatment in a seriously ill patient. The mortality associated with abdominal tuberculosis prior to the

introduction of anti-tuberculous chemotherapy has been recorded at 20-50%[14]. Many reports describe a significant number of patients in whom tuberculosis could not be diagnosed during the life of the patient but was revealed at necropsy[20,21]. There are, therefore, serious risks when waiting for histologic or bacteriological confirmation of the diagnosis in the seriously ill or frail elderly patient[22]. Many studies in the past have concluded that laparotomy and biopsy are the necessary final arbiters in the diagnosis[23] this should not be taken lightly, particularly in the very sick patients[10,23]. For such patients, a therapeutic trial of antituberculous treatment is usually safe and is advocated by many authors[21,24,25] This practice of empirical therapy should, however. be utilized with great caution. This has resulted in the appearance of multi-drug resistant tuberculosis and a number of missed diagnoses. Firstly the clinical situations in which empiric therapy needs to be considered should be well defined to limit the potential of misuse.

Based on the literature review and our clinical experience, we consider the following clinical scenarios eligible for this approach.

1.Seriously ill patients, in endemic areas, needing in-hospital care with a strong clinical suspicion of abdominal tuberculosis. A clinical and biochemical evidence of an ongoing inflammatory process or in certain cases, suspicion of wide disseminated malignancy with an unknown primary.

2.Patients with vague abdominal symptoms of some months duration where initial attempts to establish tissue diagnosis are either negative or facilities for this approach are not available. The majority of such patients should show signs of an inflammatory process, such as low-grade temperature with or without weight loss. A minimum of radiological investigations should include a double contrast barium enema, a small bowel enema and a complete abdominal ultrasound with ascitic fluid for DR and culture, if identified. We consider this the minimal investigative approach before starting a patient empirically on ATT for presumptive abdominal tuberculosis. The patient should be carefully monitored for the improvement of symptoms, weight gain and a fall in ESR; if there is no significant improvement after 4-6 weeks, the empirical treatment should be discontinued and some other diagnosis should be considered. An algorithm for the management of such patients should be designed and followed strictly to rule out the possibility of missing out a diagnosis. We have designed one such protocol, as shown in Figure 4.

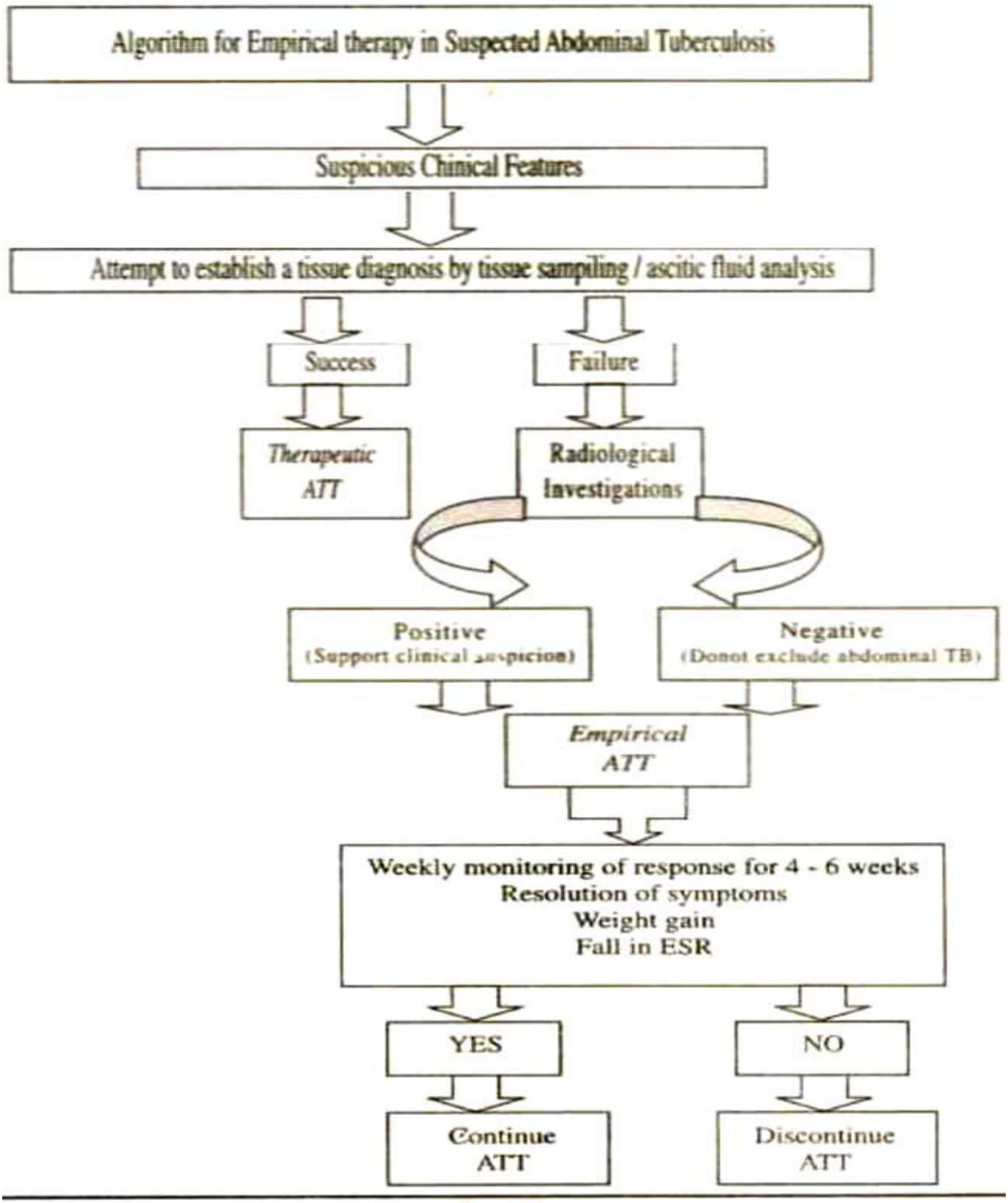


Figure 4

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