

Ruptured Appendix in Tuberculous Abdomen

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Abstract

Abdominal tuberculosis is the commonest extra pulmonary clinical condition. Abdominal tuberculosis is a chronic condition with vague symptoms and unclear signs. Acute abdomen in tuberculous abdomen is rare and is usually secondary to other intra abdominal pathology such as acute intestinal obstruction due to small bowel adhesions, or at ileo caecal junction. Sometimes there may be small perforation due to adhesions. Acute appendicitis can occur at any age or gender both in tuberculous or non- tuberculous abdomen. Acute appendicitis secondary to tuberculosis is quite rare. Clinical picture of peritonitis is seen whenever there is perforated appendix.

Keywords: Tuberculous abdomen; Ruptured appendix; Peritonitis

Introduction

Tuberculosis is still a major communicable disease in world, more so in the developing countries (Asia and Africa). There are about 200 million people affected by TB and an estimated 3.5 million die from the disease annually. Abdominal tuberculosis is seen around 5% of the patients and peritoneal TB is seen in about 25% of these patients [1].

Abdominal TB may occur without the gastro-intestinal organ involvement. Symptoms of abdominal TB are non-specific and signs are non-confirmatory. Chronic pain abdomen, distension, fever, night sweats and loss of appetite give clue to the diagnosis which further requires investigations.

Acute abdomen can occur due to other organ involvement such as tubercular peritonitis, acute intestinal obstruction or acute appendicitis as seen in our case.

Acute appendicitis may be tubercular or non-tubercular in pathology and the surgical therapy remains the same that is appendectomy, other associated pathologies such whitish nodules, mesenteric lymphadenitis and ascites etc. needs to be taken into consideration.

Case report

A 35 year old man was admitted in BIMS on 13-09-2013 with pain abdomen and vomiting since 15 days. On elaboration it was noted that the patient was having pain abdomen on and off since 6 months and he was taking medications from the local practioners such as antacids and Rantac (Ranitidine) Tablets. In the last 4-5 days the pain abdomen was severe, associated with vomiting and loss of appetite. The patient had fever 2 -3 days prior to admission for which he took tablets from local Practitioners. On admission the temperate was 38.8° C. There was no classical history of evening rise of temperature of night sweats. The patient was very sick and was unable to eat anything hence the village people brought him to the hospital. HABITS- Patient was an Alcoholic and smoker over 10 years.

On examination the patient was an young man moderately built and nourished looked very ill, toxic, dehydrated, anemic and hypotensive . The patient was conscious and oriented but was very weak to talk. Vital signs recorded were BP 90/60 mmHg, Pulse-100/min and low volume, respiratory rate 18/min.

Abdominal examination revealed distension of abdomen, with marked tenderness, guarding and rigidity. Liver dullness was obliterated on percussion.

Absent bowel sounds was noted on auscultation. All the clinical signs were highly suggestive of PERFORATIVE PERITONITIS with shock. Other systemic examination was normal. The patient was aggressively resuscitated with IV fluids, Oxygen by mask, Naso gastric aspiration, catheterization and broad spectrum antibiotics (Table 1).

Sr. No.	Blood investigations	Urine examination	L F T
1.	Hb-4.0 gm%	Albumin present	Direct Bilirubin – 1 mg/dl
2.	ESR – 40 mm / 1st hour	Sugar - Nil	Indirect Bilirubin – 1.1 mg/dl
3.	Blood group O+ve	Microscopy – 4.5 Pus cell's/ HPF	Total Protein -5.2 g %
4.	TLC 18,200/cmm		Albumin -2.7 g%
5.	DLC N = 86%		A/G ratio – 1
6.	L= 08%		ALT -29.6 u/l
7.	E = 05 %		AST- 79.5 u/l
8.	Blood urea – 57.4 mg / dl		
9.	Serum creatinine – 0.7 mg/dl		

Table 1: Blood investigations and Urine examination

All the routine investigations and relevant X-rays done. Chest X-ray showed gas under the diaphragm.

Investigations

Ultra Sound

USG abdomen showed probe tenderness all over the abdomen. Fluid collection in the right iliac fossa. Moderate ascites was present. Bladder was partially full. Other organs were normal.

Management

The patient was a young man severely ill and toxic, anemic with PERFORATIVE PERITONITIS, was unfit for general anaesthesia and surgery, He was aggressively resuscitated and anaemia was corrected. A broad spectrum antibiotic was given intravenously.

Abdominal paracentesis was done under LA there was brownish yellow fluid aspirated.

Peritoneal aspirate examination

- Reddish yellow in color
- 10 ml sample
- Cell count -L-20%
- N-10%
- Mesothelial cells - 70%
- Nil for malignant cells

AFB stain was negative.

The General condition improved gradually and BP stabilised (120/90) and Pulse 94/min.

He was taken up for exploratory laparotomy on 5th day 18/09/2013.

Operation 18/09/2013

Exploratory laparotomy was done under G.A

Abdomen was opened through vertical midline incision.

Findings- Turbid yellowish brown fluid in the peritoneal cavities about 1200-1500 ml.

Pus was seen in the Right iliac fossa.

Acutely inflamed appendix with rupture at the tip surrounded by pus was seen (Figure 1).



Figure 1: Acutely inflamed appendix with perforation

Extensive whitish nodules all over the mesentery (Figure 2) small bowel wall, anterior abdominal wall noted. Multiple mesenteric nodules and lymphadenopathy was noted (Figure 3). Liver and spleen was normal.



Figure 2: Multiple whitish mesenteric nodules

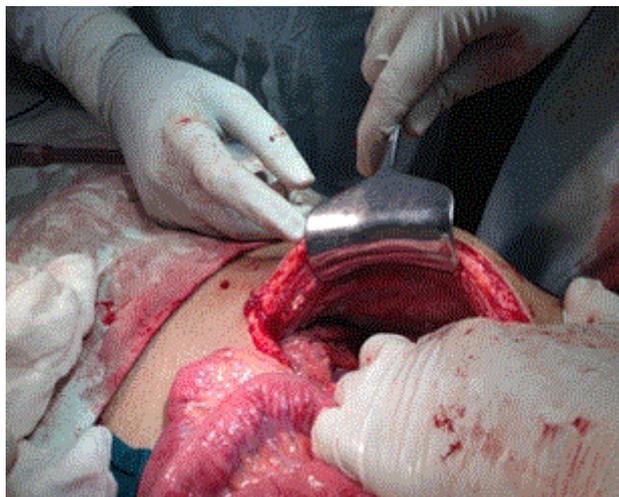


Figure 3: Whitish nodules on the anterior abdominal wall

Procedure done - Aspiration of all the peritoneal fluid and thorough warm saline wash was given. Careful appendectomy was performed without burial of the stamp. Few whitish nodules were excised for histopathology. Mesenteric node was taken for biopsy. Abdomen was closed with a drain in the right para colic gutter. The patient was shifted to SICU for better monitoring.

Post-Operative Period

The patient had stormy and prolonged post-operative recovery. The patient was managed with IV fluids, broad spectrum antibiotics (Piperacillin and Tazobactam), metrogyl, oxygen by mask and multivitamins along with other supportive care. The patient received 4 units of blood transfusion. The patient had multiple complications such as severe chest infection which was adequately managed with consultation from medical and respiratory physicians. He needed bronchodilators, steroids and chest physiotherapy.

The patient also had prolonged paralytic ileus which was managed by IV fluids, electrolyte correction, potassium supplementation and NG aspiration.

The patient also developed wound infection around drain site with persistent pus discharge after removal of the drain. The patient needed exploration and evacuation of the pus collection around the drain site (100 ml of pus).

Pus culture was done and an appropriate antibiotic was instituted. Pus discharge gradually reduced and the wounds healed well. The patient gradually started taking soft diet progressed to solid diet along with AKT (Antikoch's treatment). He was on regular asthaline nebulisation.

Biopsy of the appendix was reported as acutely inflamed appendix with perforation. Mesenteric node biopsy was reported as non-specific inflammation with reactive changes. The author had seen such abdominal tuberculosis in the past and strongly advocated anti TB treatment. The patient received DOTS (directly Observed treatment Schedule) along with Inj. Streptomycin 0.75 g on alternate days. The patient was discharged on 08/11/2013 after 25 days in good condition

Discussion

Revised National Tuberculosis Control Programme

Following an external review of the existing National TB Programme in 1992, the Revised National TB Control Programme (RNTCP) was formulated. The RNTCP addressed the weaknesses of the NTP noted by the 1992 review, and adapted to the Indian setting the globally recommended "DOTS Strategy" for TB control. After a pilot phase (1993-97) RNTCP was scaled up in a phased manner to cover the entire country by March 2003.

Goal and Objectives of RNTCP

The goal of RNTCP is to decrease the mortality and morbidity due to tuberculosis and cut down the chain of transmission of infection until TB ceases to be a public health problem. The goal is achieved through the following objectives.

To achieve and maintain:

- Cure rate of at least 85% among newly detected smear positive (infectious) pulmonary tuberculosis cases; and
- Case detection of at least 70% of the expected new smear positive PTB cases in a community.

However, the current focus is on ensuring universal access to quality assured TB diagnosis and treatment services under the programme.

Directly Observed Treatment Short Course (DOTS) strategy

DOTS is a systematic strategy to control TB disease. This has the following 5 components:

- Political and administrative commitment
- Good quality diagnosis, primarily by sputum smear microscopy
- Uninterrupted supply of quality drugs
- Directly observed treatment (DOT)
- Systematic monitoring and accountability

Tuberculosis is major communicable disease worldwide majority of the tuberculosis patient are from the Asian countries and sub-Saharan Africa.

Global impact of TB is enormous, by 2020 an estimated 200 million will be affected and about 35 million will die from tuberculosis. Abdominal tuberculosis is seen in about 5% of TB patients of these 25% will have peritoneal involvement. Abdominal tuberculosis in association with pulmonary tuberculosis is about 20-25% [1]. Peritoneal tuberculosis can spread through mesenteric lymph nodes or tubercular salpingitis as seen in females.

Abdominal mesenteric nodal involvement and peritoneal tuberculosis may occur without the organ involvement in the abdomen in some cases [2,3].

Abdominal tuberculosis in the sixth most frequent site of extra pulmonary involvement.

Tuberculosis can involve any part of the GI tract. Tubercular bacteria can reach the GI tract via haematogenous route which is common, ingestion of infected sputum, direct spread from contagious lymph nodes or fallopian tubes.

Peritoneal tuberculosis presents in 3 forms.

1. Wet type - seen as ascites.
2. Dry type - seen as adhesions
3. Fibrotic type – seen as omental thickening and loculated ascites.

Ileo – caecal tuberculosis is the most common variety.

Ileo – caecal and small bowel TB often presents as mass in the right iliac fossa.

Complications such as sub-acute or acute intestinal obstruction and or perforation of the bowel are noted.

Multiple small bowel strictures present as repeated attacks of abdominal pain, diarrhoea and mal-absorption in some patients.

The patients with abdominal tuberculosis usually have abdominal pain, loss of appetite, loss of weight and fever.

The frequencies of abdominal tuberculosis are

- Abdominal pain & distension – 82%
- Loss of weight – 80%
- Generalized weakness – 76 %
- Loss of appetite – 75%
- Fever with night sweats – 69%

The signs of abdominal tuberculosis vary in acute presentation or chronic presentation.

In cases of chronic presentation the usual signs are

Ascites which is gradual and progressive – 96%

Fever low grade with night sweats - 75 % [4].

Acute presentations in case of abdominal tuberculosis vary according to the intra abdominal pathology.

In case of peritonitis be it a small bowel perforation, appendicular perforation, classical signs of peritonitis such as guarding rigidity all over the abdomen with obliteration of liver dullness and loss of bowel sounds are noted.

In case of acute intestinal obstruction there will be abdominal distension, vomiting, constipation, prominent loops with visible peristalsis with hyper peristaltic sounds are noted [5].

Management of Abdominal Tuberculosis

Abdominal tuberculosis is a chronic condition and it can be diagnosed by various investigations. History of chronic illness, abdominal distension, loss of appetite, loss of weight with fever gives clue to the diagnosis on examination. The patient is ill, cachexic, malnourished and had ascites.

Routine blood and urine examination are usually normal. Ascitic fluid analysis indicates it is an exudate with high proteins with predominant lymphocytes. AFB stain is occasionally positive AFB culture is positive in some patients.

Chest X-ray is helpful in detecting pulmonary tuberculosis. USG examination shows ascites, inter loop collection, thickened bowel loops, mesenteric lymphadenopathy and atypical peristalsis at strictures of the small bowel.

In a study over 15 years (1981-1996) in Kuwait the authors found that young adults were predominantly affected. The common symptoms were abdominal swelling, anorexia, fever, sweating and loss of appetite.

Ascites and sub-acute and acute intestinal obstruction were the frequent clinical presentation. Two of these patients had acute appendicitis and one had pancreatitis. Laparoscopy was found useful in diagnosis. All the patients responded well to the anti TB treatment [6].

Abdominal tuberculosis has varied clinical presentation. Past history of tuberculosis is very significant contribution and active tuberculosis in other part of the body that increases the chance of abdominal tuberculosis. In one analysis there was about 30% of the patients had tuberculosis previously.

CT examination showed ascites, enlarged nodes in about 80% of the cases. Peritoneal fluid for staining and culture was positive only in 33%. Laparoscopy and biopsy was done in 61% and granuloma was seen in 97% of these cases. The patients recovered well with anti TB treatment for 9-12 months [7].

The diagnosis of abdominal tuberculosis objectively still remains a challenge. In a study of 31 patients ascitic fluid for AFB Smear / Culture was positive in only one patient (1/31) Laparoscopy showed dilated loops, thickening of the mesentery and multiple tubercular over the peritoneal 4 patients (4/31).

Abdominal tuberculosis was confirmed microscopically in 5 (5/31) patients. A typical tubercular granuloma was seen in 19 (19/31) patients. The remaining patients responded well to anti TB treatment [8].

Tubercular appendicitis is quite rare inspite of abdominal tuberculosis being a common clinical entity. Ileo caecal tuberculosis is very common in abdominal tuberculosis.

Appendicular involvement is rare and involves only about 1.5 to 3 % of all cases. The appendix can be involved secondary to ileo caecal tuberculosis or small bowel TB and rarely isolated cases are seen [9].

Tubercular appendicitis presents as an acute appendicitis and to be treated as such with appendicectomy. Histological surprise is seen after the biopsy report. It is very interesting to note that autopsy of tuberculous abdominal patients revealed an appendicular involvement in about 30% of these patients [10].

Imaging in Abdominal Tuberculosis

These are many imaging modalities available now a days from simple x-ray to complex CT. and MRI. Latest newer modalities are small bowel follow through (SBFT) Multi detector CT (MDCT), CT enterography, CT and Sonoenteroclysis which gives additional information. The authors studies 20 cases of abdominal tuberculosis and found a quality assessment of well distended bowel loops and adjacent soft tissues. This technique displays thickness and enhancement in 3 planes of the bowel and allows the examination of all bowel loops even when loops are super imposed.

Terminal ileum and caecum are commonly involved in tuberculosis. Short segment strictures with symmetrical concentric mural thickening, homogenous enhancement is seen.

Other associated findings like mesenteric lymphadenopathy, ascites, peritoneal thickening etc are noted the authors conclude that MDCT enterography is a comprehensive technique for the evaluation of abdominal (small bowel) tuberculosis [11].

Pharmacotherapy in Abdominal Tuberculosis

DOTS (Directly observed treatment strategy) are a programme to ensure the cure by providing the effective medicine and confirming it is taken.

The Government of India, WHO and World Bank together reviewed NTP (National tuberculosis Policy) in 1992. RNTCP was

launched in 1993. Pilot phase I, Pilot phase II and Pilot phase III of 2006 March covers the entire country.

WHO launched the new stop TB strategy -2006 to be implemented over the next 10 years in Global plan to stop TB 2006-2015 (As DOTS programme) (Table 2) [12].

Category	Type of patients	Duration	Drugs
CAT I	New sputum positive case or sputum negative but pulmonary TB or seriously ill extra-pulmonary TB	Intensive Phase (2 months)	INH, ETB, RMP, PZA
		Continuation Phase (4 months)	INH, RMP
CAT II	Retreatment group (previously treated) either phase relapse or treatment failure patients	Intensive Phase (3 months)	2 months – INH, RMP, ETB, SM, PZA 1 month – INH, RMP, ETB, PZA
		Continuation Phase (5 months)	INH, RMP, ETB
CAT III		Intensive Phase (2 months)	INH, RMP, PZA
		Continuation Phase (4 months)	RMP, INH

Table 2: Global plan to stop TB 2006-2015

Patient wise drug boxes

The drugs are supplied in patient-wise boxes (PWB) containing the full course of treatment, and packaged in blister packs. The PWB have a color code indicating the two regimen – **Red for “New”, Blue for “Previously Treated”**. In each PWB, there are two pouches one for intensive phase and one for continuous phase. In the intensive phase, each blister pack contains one day’s medication. For the continuation phase, each blister pack contains one week’s supply of medication. The drugs for extension of the intensive phase (prolongation pouches) are supplied separately (Table 3).

Drugs	Dose in mg/kg daily	Daily dosage for average individual adult	ADE
Rifampicin (RMP)	10 mg	450 – 600 mg	Hepatitis
Isoniazid (INH)	5 mg	300 mg	Peripheral neuritis, hepatitis
Pyrazinamide (PZA)	25 mg	1250 – 1500 mg	Arthritis
Etambutol (ETB)	15 mg	800-100 mg	Optic neuritis
Streptomycin (SM)	15 mg	1000 mg	VIIIth nerve toxicity renal toxicity.

Table 3: Drugs dosage charts for adults

Abdominal tuberculosis is treated as category I

New Cases

CATEGORY -I Types of patients

- Sputum smear positive
- Sputum smear Negative

RED BOX

- - Sputum smear positive
- Extra Pulmonary (Meningitis, Peritonitis, spinal TB, Intestinal &Genito-urinary TB etc)
- And Others

Dots Treatment Regimen

	INTENSIVE PHASE (IP)	CONTINUATION PHASE (CP)
	2 H3 R3 Z3 E3	4 H3 R3
DRUGS	DOSE (THRICE A WEEK)	PACKAGE
ISONIAZCD (H)	- 600 mg	- 2 x 300 mg
RIFAMYCIM (R)	- 450 mg (2)	- 1 x 450 mg
PYRAZINAMIAE (Z)	- 1500 mg	- 2 x 750 mg
ETAAMBUTOL (E)	- 1200 mg	- 2 x 600 mg
STREPTOMYCIM (S)	- 0.75 g 3	- Separate

This schedule is for a 60 kg (+) patient [13].

The authors in a study of 50 consecutive cases of abdominal tuberculosis have found that the patient population was not born in UK, but immigrants from Bangladesh, India, and Pakistan. 10% of these patients had HIV and 30% had co-existing pulmonary tuberculosis. Peritoneal involvement was seen 52%. Histological evidence through Laparoscope was positive in 88% of the cases. The authors recommend laparoscopic biopsy for histological evidence is the choice in the management of abdominal tuberculosis. The patients received anti TB treatment on average of 7 months [14].

Tuberculosis detected in early stages is necessary for an effective treatment. Chest X-ray good investigation to detect parenchymal disease in the chest but CT scan is required for lymphadenopathy and abdominal disease. Other multi modalities such as MRI for Spinal involvement is needed, PET is showing promising results which may be more useful than future. In detecting abdominal tuberculosis and lymph nodes not involvement is best done by using CT scan.

In our patient we did not get CT scan as the clinical diagnosis was perforative peritonitis which needed exploratory laparotomy [15].

Summary

Tuberculous Abdomen is a chronic debilitating condition but it can have acute presentation when associated with other intra-abdominal pathology such as acute appendicitis as seen in our case. The patient underwent appendectomy and it was non-tubercular acute appendicitis. All the other intra-abdominal findings such as ascites tubercular nodules over the mesentery, bowel wall and mesenteric lymph adenopathy were highly suggestive of tuberculosis. The patient made rapid recovery after he was treated with anti TB, DOTS regimen. To the best of our knowledge abdominal tuberculosis with ruptured appendix has not been reported hence it is being reported. The patient has completed DOTS treatment of 6 months and doing well.

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