# Role of Multi Slice CT in Abdominal Tuberculosis.

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***Abstract**: With the purpose of evaluating role of multislice CT findings in abdominal TB, 27 diagnosed cases were reviewed. Diagnosis was based on the microbiological or pathological analysis of abdominal tissue or by improvement seen following anti-tubercular chemotherapy. Most findings on multislice CT included mesenteric rim and homogeneously enhancing lymphadenopathy, thickened bowel in ileocecal region, ascites, hypodense lesions in liver and spleen, mesenteric and omental soft tissue thickening. multislice spiral CT appeared to be the modality of choice to demonstrate the wide spectrum of findings seen in the abdominal tuberculosis. Multislice spiral CT was able to demonstrate more number of findings as compared to sonography in patients with abdominal tuberculosis. Also features like the internal characteristic of lymph nodes and thickening and enhacement of small bowel wall were better delineated than sonography. Multislice spiral CT led to higher detection of lymphadenopathy as compared to that of spiral CT reported in literature. The combination of findings seen may help in the diagnosis of abdominal TB in proper clinical setting.*

## INTRODUCTION

Despite progress in prophylaxis and therapy, abdominal tuberculosis remains a rampant health problem in developing countries like India. With the emergence of AIDS and increasing use of immunosuppressants, there has also been a resurgence of tuberculosis in developed countries, particularly of abdominal tuberculosis.[1,2]

Early administration of chemotherapy in abdominal tuberculosis is important as it can achieve satisfactory results.[3] Positive response to therapy, itself helps in diagnosis[4] and prevents the development of complications, which may require surgery. In spite of the development in diagnostic modalities, diagnosis of abdominal tuberculosis remains a challenge even to the most experienced physician. This is because many patients with extra-pulmonary tuberculosis present with non-specific signs and symptoms.

A plain radiograph of the chest is important in diagnosis, as abdominal involvement complicates pulmonary tuberculosis in 6% - 38% of patients.[5] Plain radiograph of the abdomen may show ascites, gaseous distension of the intestinal loops, right iliac fossa mass, perforation, calcification and enlargement of the liver and spleen but these findings are not specific for abdominal tuberculosis. Barium studies are a useful guide for gastrointestinal tract involvement but not for solid viscera.

Ultrasound (US) using 3MHz and 5MHz transducers is a useful initial investigation. The whole abdomen, including the viscera, can be evaluated by US, and guided biopsies/fine needle aspirations obtained, which help in diagnosis.

Computed tomography (CT) has been found to be very useful in abdominal tuberculosis. CT scan is reported to be better than ultrasonography for showing high-density ascites, caseous necrosis of lymph nodes (as low attenuation necrotic centers and thick enhancing inflammatory rims) and mesenteric involvement, as bowel gas may prevent visualization of the mesentery on US.

With the advent of multidetector row CT the scanning time has reduced, so there are less motion artifacts and single breath-hold acquisition is possible, which improves vascular contrast enhancement.[6]With multislice CT (MSCT) the desired volume can be examined using thinner sections than those possible with single slice helical CT. Multiplanar reconstructions can then be carried out in any desired plane, these having the same resolution as the axial image.[7] Also three-dimensional imaging is possible using Volume Rendering techniques- Maximum Intensity Projection (MIP), and Virtual Endoscopy.[8]

## MATERIALS AND METHODS

Twenty-seven patients with proven abdominal TB are reviewed which were evaluated by chest x-ray, ultrasonography and CT. Barium study (barium enema or barium meal follow through) was done in 13 patients with gastrointestinal tract involvement.

The diagnosis in the study group was confirmed by guided FNAC from abdominal lesions and laparotomy with histopathology in 29% patients (8/27) each. In the remaining 11 patients (41%) with clinical as well as radiological features suggestive of abdominal TB, tubercular etiology was considered based on positive response to anti-TB chemotherapy. Two of these 11 patients also had proven extra abdominal TB.

Non-contrast and contrast enhanced CT examination of patients were carried out using Somatom Plus 4 Volume Zoom MSCT scanner. Scanning was done with collimation of 3mm reconstructed at 1.5mm intervals following intravenous administration of 100-120 ml of non-ionic contrast (300 mg I/ml at 2.5 ml/sec). Gastrointestinal tract was distended using plain water given orally and air/water given per rectally.

## RESULTS

The study group comprised of patients ranging from 9 to 55 years of age. Maximum numbers of patients were aged between 11-30 years accounting for 64% of cases.The mean age for the study group was 27 years**.** Abdominal Pain was the most common complaint, followed by loss of appetite and weight loss.

Abdominal tenderness was the most common sign seen in 37 % of patients. RIF mass, ascites and peritoneal signs were seen infrequently whereas palpable nodal enlargement was one of the least common presentation.

On chest radiograph pulmonary involvement was seen in 19 patients out of 37 patients (51%) of suspected abdominal tuberculosis and was mostly a combination of infiltration and adenopathy with or without calcification or pleuro-parenchymal changes.

In the 27 patients of abdominal TB, lymphadenopathy was the most common manifestation on computed tomography, seen in 25 patients (92%). Intestinal involvement was seen in 19 patients (70%).). Isolated small & large bowel involvement was noted in 8/27 (29%) and 4/27 (14%) patients respectively. Seven patients had both small and large bowel involvement. Tubercular peritonitis was seen in 7 patients (26%). Hepatic involvement was present in 4 (14%) patients and splenic involvement in 2 patients (7%). Pancreatic involvement was seen in only one patient. Pattern of organ involvement as seen on CT is given in table 1.

### *Tubercular lymphadenopathy*

25/27 patients (92%) patients had abdominal lymphadenopathy. The size of the lymph nodes varied from 0.6 to 4.5 cm (short axis). Enlarged lymph nodes were found mainly in the mesenteric, peripancreatic, upper para-aortic and lesser omental (periportal) regions. Mesenteric compartment was most commonly involved (96%). In 52% patients more than one compartment was involved. In unicompartmental involvement it was the mesenteric region

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