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IN2 – INFECTION-TUBERCULOSIS

CT in Abdominal Tuberculosis

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Despite significant advances in diagnostic techniques and discovery of effective antitubercular treatment, abdominal tuberculosis continues to be a major cause of morbidity and mortality in India (developing countries). The situation has also changed in the west where AIDS epidemic has caused a rapid re-emergence of tuberculosis.

Clinically, tuberculosis can mimic a large number of conditions such as peptic ulcer, lymphomas and carcinomas. The investigative procedures used are numerous reflecting the inadequacy of any single procedure. Peritoneal biopsy has a yield of 36 - 40%, ascitic fluid demonstration of AFB has only 16 - 40% positivity. Colonoscopic biopsy is positive in 40-60% of cases. Diagnostic laparotomy is accurate but causes significant morbidity.

In the abdomen, tuberculosis may affect intestinal tract, lymph nodes, peritoneum and solid viscera in varying degrees and in various combinations. Barium studies of the GIT have been the mainstay of diagnosis in the past. It has been shown that 2/3 of patients with abdominal tuberculosis have lymphadenopathy and peritoneal disease, in addition to intestinal involvement. While barium studies remain the best technique for demonstration of intestinal changes, these are unable to detect extraintestinal manifestations resulting in frequent missed diagnosis. Further, the findings on barium studies although suggestive are not always diagnostic and can mimic other conditions like malignancy, Crohn's disease and lymphoma.

CT scanning offers a comprehensive overview of abdominal structures with direct imaging of mural, serosal, mesenteric lymph nodes and visceral involvement and is therefore, considered the technique

of choice. A study of abdominal CT scans in 66 patients of proven abdominal tuberculosis at PGI, Chandigarh, suggests that CT plays a major role in the diagnostic evaluation of abdominal tuberculosis.

According to our results, multicompartamental involvement is much more common than single site involvement. The commonest pattern observed was that of combined lymph nodal and peritoneal forms followed by lymph nodal, peritoneal and intestinal variety together. Only 10% of cases showed either isolated involvement of lymph nodes or intestinal involvement.

Lymph nodal involvement: Quite common and is seen in almost 2/3 of patients. Distribution of enlarged nodes and their morphology depict distinct features which are quite characteristic. Mesenteric and retroperitoneal areas are affected most commonly followed by peripancreatic group and portal group. While isolated involvement of mesenteric group of lymph nodes is quite frequent, isolated involvement of retroperitoneal group is least common and was seen only in 1 out of 66.

The various patterns of lymph node morphology include in decreasing order of occurrence:

- i. enlarged nodes with hypodense centres and a hyperdense peripheral rim.
- ii. increased number of normal size nodes.
- iii. conglomerate mixed density nodal masses
- and
- iv. enlarged nodes which may be homogenous in appearance.

Low density centre representing caseous necrosis is very characteristic of tuberculosis but by no means pathognomonic, as it can also be seen in metastases from testicular tumours, Whipple's disease and rarely in lymphoma following Radiotherapy. However, lymph node metastasis from testicular carcinoma are usually seen in the lower retroperitoneum while associated intestinal and peritoneal changes in tuberculosis help in differentiating it from Whipple's disease.

Peritoneal involvement: Peritoneal involvement is as frequent as that of lymph nodes and can be seen in up to 2/3 of cases. Common CT features include mesenteric or omental infiltration, ascites (free or loculated) peritoneal enhancement or thickening. Mesenteric infiltration is in the form of linear strands/thickened leaves/increased soft tissue density masses or sheets engulfing small bowel loops. Less commonly there may be fluid or abscess in mesenteric leaves. Omental involvement is seen as smudged appearance or presence of small nodules in the omentum which may look like an omental cake. Most of these features considered individually can be seen in other conditions such as peritoneal mesothelioma carcinomatosis and peritonitis of any form. However, when present in combination with other findings particularly hypodense nodes and mural thickening affecting the ileocecal region, highly suggests a diagnosis of tuberculosis.

Intestinal involvement: Intestinal involvement is seen in up to about half of the cases. It appears as concentric mural thickening affecting the terminal ileum or caecum or more commonly involving both the regions. Mural thickening is usually homogeneous though in a few patients low density contrast may be noted within the wall.

Skip areas of mural thickening of distal or mid-small bowel can be seen in more than half of cases with intestinal disease, often with an associated ileocaecal involvement. Isolated involvement of ileocaecal region is present in up to 25% of all cases.

Varying pathologic processes like ischaemic enteritis, Crohn's disease and primary or secondary bowel malignancies can show similar features of intestinal involvement but the preferential involvement of ileocaecal region and the associated hypodense lymph nodes and peritoneal changes when present usually help in distinguishing tuberculosis from these diseases.

Solid visceral involvement: This is relatively less common and only one eighth of the patients in our study showed focal hypodense lesions of variable size and density in the liver and spleen. These lesions cannot be differentiated from other conditions like-

lymphoma, fungal infection or metastatic deposits unless features due to lymph node or gut involvement are also present. Pancreatic involvement is very rare and was seen in only 2 of our cases. The lesions appeared as a hypodense area seen within the head of pancreas associated with peripancreatic lymphadenopathy, an appearance indistinguishable from carcinoma.

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