MATERIAL AND METHOD
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The present study has been carried out in patients clinically diagnosed to be cases of intestinal tuberculosis.

The patients were examined radiologically by conventional barium meal follow through examination and double contrast small bowel enema in Department of Radiology, M.I.B. Medical College and Hospital Jhansi during the period of May 1982 to April 1983, referred from indoor and outdoor departments by clinicians, having strong clinical evidence of abnormality of small bowel ' Intestinal Tuberculosis ' as clinical entity.

The double contrast small bowel enema was carried out in patients having strong clinical evidence of small bowel disease but without positive radiological finding on conventional barium meal follow through examination.
An attempt has also been made to correlate the results of study with clinicopathological observations, postoperative findings and histopathological observations.

The following procedure has been adopted.

1. **HISTORY** -

   In each case a detailed history of patient was taken with particulars of patient i.e. Name, age, sex, religion, food habits, family history, past history and complaints in chronological order.

   History of present illness was taken with emphasis laid on site and mode of origin of complaint and disease, altered bowel habits and progress of disease. Any significant past history of illness, previous operation was also taken.

2. **PHYSICAL EXAMINATION** -

   The physical examination was carried out under following headings.

   a) **General Examination** - Patient's pulse, degree of anaemia, jaundice, clubbing, physical state etc. were recorded.
b) **Local Examination** - A thorough clinical examination of abdomen was done to assess size and extent of the disease particularly in relation to any lump present, ascites, visible peristalsis or local tenderness. The size, shape, consistency, mobility and fixation of palpable lump were looked for clinical examination.

b) **Systemic Examination** - A detailed examination of respiratory system to exclude or include the pulmonary tuberculosis was also carried out.

A casual examination of other systems was also carried out to find out any associated coincidental disease.

3. **RADIOLOGICAL INVESTIGATIONS** -

The cases were investigated by following radiological investigations.

a) Conventional barium meal follow through examination.

b) Double contrast small bowel barium enema.

4. **POSTOPERATIVE HISTOPATHOLOGICAL REPORT** -

Whenever possible a postoperative and histopathological confirmation were aimed at to confirm the pre-operative diagnosis.
TECHNIQUE OF SMALL BOWEL BARTRAM ENEMA —

Equipment —

a) **Ryles Tube with guide wire** — For duodenal intubation a simple polythene ryles tube, 100 cm. long of adult size, was used. It contained 6 side holes within first 8 cm. of its tip. Except for the distal most 4 cm., all other side holes were closed by araldite adhesive paste. The tip of ryles tube has been made more heavier by introducing 6 iron beads into its lumen.

b) **Contrast medium** — Creambar was used as non-floculating contrast medium in proper dilution with tap water (3 parts of barium sulphate powder dissolved into two parts of water).

c) **Radiographic apparatus** — 500 mA, 100 kVp 75 cm. X-ray machine with motor driven table, potter bucket diaphragm and having a spot film device was found to be most suitable machine in the department for this investigation.
d. **Accessories**

1. Dark room accessories.
2. Illuminating viewing box.
3. 10" x 12" & 15" x 12" double coated X-ray films.
4. Glass syringes of various sizes.
5. Metoclopramide injection ampoules.
7. Needles 23G. No. 18 to No. 22.
8. Statistical calculation chart.

**Patient's Preparation**

A day prior to the investigation light diet was given to patient. In preceding night a mild laxative was given at bed time after that patient was kept nil orally till the investigation was over.

Since a full ascending colon and treatment with drugs that produce gastrointestinal atony were regarded the most common cause of delayed passage of barium, an empty colon and avoidance of such drugs were basic necessary conditions prior to the investigation. However no rectal enema was advised in most of the cases.
TECHNIQUE:

The technique involved two steps.

1. Duodenal intubation.

2. Infusion of contrast medium and radiography.

1. Duodenal Intubation - The duodenal intubation was done through naso-pharyngeal route. The tube was thoroughly washed with boiling water and kept in salol solution 1:100 strength for 24 hours to make it sterilised. The radio-opaque tube's tip was first lubricated with xylocaine jelly and then gently pushed through one of the nasal antri of patient. The tube was gently pushed into stomach under screening control. The natural curve of tube was allowed to lie along the greater curvature of stomach. When tip of tube reached to pyloric canal, 1 ampule of metoclopramide (2 ml.) was given intravenously to the patient. Metoclopramide relaxed the pyloric sphincter of stomach and also enhanced the gastric emptying.

2-3 minutes after given injection, the tube was gently manoeuvred into the duodenum. An effort was made to push the tip of tube into 3rd part of duodenum. This whole procedure took about 5-15 minutes.
If in any case the tube end curved towards the fundus, gentle pressure into epigastrium or slight pulling out the tube and again allowing the natural curve of tube to lie along the greater curvature of stomach made the intubation possible in correct position. Throughout the whole procedure the patient was kept in supine position.

While manoeuvring the tube into duodenum, patient was asked to take deep breaths which facilitated the easy manoeuvring of tube into duodenum. The ideal position of the tip of the tube was at the junction of second and third part of duodenum. Distension of this part with barium induced vigorous peristalsis which propelled barium distally.

Cremophar was used diluted into ratio of 3 parts of barium sulphate powder suspended in 2 parts of water as non-floculating suspension. The mixture was thin enough to be injected down the tube while retaining good mucosal adherence.

The injection of barium was recommenced while patient was in supine position to allow easy screening of abdomen.
The injection was made by 50 ml. glass syringe. The rate of injection was kept about 100 ml. per minute. A more rapid injection caused the reflux of contrast into stomach. While a slower injection caused insufficient duodenal distension to promote peristalsis. The barium was steadily injected until it reached caecum. In total 400-500 ml. of crenobar was injected. Spot films were taken in antero-posterior positions. During the infusion, intermittent screening for the head of barium column was performed and whole of the small intestine thus visualised. Spot films were taken to show the various parts of small bowel.

The patient was now rotated to 45° into right anterior oblique position and air was injected down with blood pressure instrument bulb through the tube. The air passed rapidly through the small bowel giving a double contrast effect. In all 800-1000 ml air was injected in 2-3 minutes and spot films were taken in A-P and Right oblique positions.
ANALYSIS OF RESULTS

The resulted radiographs were analysed with special reference to anatomical details of the part like irregularity of the part, any distortion of the mucosal pattern, any obstruction, constriction or dilatation of the lumen.

The results in each case were correlated with clinical aspects of the cases and a tentative diagnosis was made. Whenever possible, the tentative diagnosis arrived at, was further confirmed or disproved on post operative and histopathological confirmation. Un-towards effects of the technique was also inquired from the patient and noted for analysis.