

Tuberculous ileo-colitis in Ibadan: a clinico-radiological review

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SUMMARY Twenty cases of tuberculous ileo-colitis with radiographic changes seen in the University College Hospital, Ibadan, Nigeria, are reviewed and the clinical features and radiographic patterns examined. The intestinal lesions in all cases were secondary to healed and active pulmonary tuberculosis.

Although the ileo-caecal region is the commonest site of involvement, lesions also occurred in the distal part of the colon and the entire colon was sometimes involved. Rare occurrences, such as the diverticular type, enterolithiasis, tuberculosis presenting as intussusception and as an appendicular mass, are also reported. Four principal radiological types of colonic change emerged from the study, namely, the hyperplastic, the ulcerative, the mixed ulcero-hyperplastic, and the carcinoma-like types.

The salient features in the differential diagnosis of ileo-colonic lesions in a tropical setting are discussed.

Tuberculosis of the abdomen is highly prevalent in tropical Africa, just as it is common in other developing countries of the world where malnutrition, overcrowding, and poor sanitary conditions exist. In the University College Hospital, Ibadan, abdominal tuberculosis constitutes about 2.5% of the total annual medical admissions to the adult medical wards. A number of isolated reports have come from temperate countries describing tuberculous involvement of the intestine at various sites such as the terminal ileum (Winter and Goldman, 1966), segmental lesions (Angelchik, Thabit, and Hall, 1962), caecal lesion (Anscombe, Keddie, and Schofield, 1967), distal colon (Need and Behnke, 1963), rectum and sigmoid colon (Martin, 1932), and the entire colon (Virmani, 1963).

The purpose of this study therefore is to examine the pattern of tuberculosis of the intestine in Nigerian patients amongst whom the disease is highly prevalent and to differentiate it from other ileo-colonic lesions common in tropical areas of the world.

Materials and Methods

The case notes of patients treated for tuberculosis of the intestine in the University College Hospital

from 1963 to 1969 were carefully gone through and those with a proven histological diagnosis of tuberculosis from gland biopsy and/or of a resected specimen together with suggestive radiological changes were selected for the study.

There were 17 patients who satisfied the above criteria. Three other patients with highly suggestive radiological changes, a strongly positive Heaf test, and a positive response to antituberculous treatment were also included. One of these three patients also had positive sputum specimens for acid-fast bacilli. There were five males and 15 females with a male to female ratio of 1:3. The ages ranged from 10 to 50 years with a preponderance of patients in the third decade.

The findings obtained at laparotomy and at necropsy were also included.

Results

SYMPTOMS

The most common complaints on admission were those of abdominal pain, fever, anorexia, weakness, and progressive weight loss (Table). The abdominal pain was usually intermittent and colicky in nature, or sometimes described as wandering around the umbilicus. It was often associated with nausea and occasionally with vomiting. Evening pyrexia was also common.

Symptom	No.	Sign	No.
Fever	20 (100%)	Abdominal tenderness	20 (100%)
Abdominal pain	20 (100%)	Loss of flesh and emaciation	20 (100%)
Anorexia	20 (100%)	Abdominal mass	11 (55%)
Weight loss	20 (100%)	Lymphadenopathy	3 (15%)
Diarrhoea	16 (80%)	'Adult kwashiorkor'	2 (10%)
Vomiting	8 (40%)		

Table *Symptoms and signs in patients with tuberculous ileo-colitis*

Chronic diarrhoea occurred in 80% of cases, the stool being watery or soft and not usually containing blood.

Constipation rarely occurred except for one patient who had intestinal obstruction. The duration of the symptoms ranged from one month to three years, the commonest period being six months.

PHYSICAL EXAMINATION

The patients were in all cases chronically ill and emaciated. Two of them had the classical features of adult protein calorie malnutrition with characteristic skin and hair changes, and oedema of the feet.

In three cases large palpable glands were present in the neck, axilla, and inguinal regions respectively.

Abdominal masses were felt in 11 of the 20 patients and were localized in the right iliac fossa in three, around the umbilicus in five, and generalized and doughy in three others; in two cases there was ascites. The abdomen was tender to palpation in all cases.

LABORATORY INVESTIGATIONS

All 20 patients showed a marked degree of anaemia with packed cell volume ranging between 14 and 37, with an average of 28%. Macrocytes were found in peripheral blood films from three patients whose bone marrow also showed changes of transitional megaloblastic erythropoiesis. The white cell counts were within normal limits except in three patients where a leucocytosis of over 10 000 per cmm was present.

The serum electrolytes and urea were generally within normal limits except for two cases with hypokalaemia probably due to chronic diarrhoea. The serum proteins were generally low with albumin ranging between 1.1 and 2.4 g/100 ml and globulin fraction ranging between 1.4 and 6.5 g/100 ml; the average total serum protein was 5.5 g/100 ml. (The normal ranges for Nigerians are albumin 2.5-5.5 g/100 ml and globulin 2.4-5 g/100 ml.)

Serous coloured ascitic fluid was present in two patients and contained numerous lymphocytes. Protein contents were generally high and of the order

of 3.5 g/100 ml. Sera were sterile on culture and contained no malignant cells.

Stool specimens were often soft or watery and contained mucus but no blood. Undigested vegetable matter and excess fat globules were found in three stool specimens. *Ascaris*, *trichuris*, and scanty ova of a strongloides or hookworm were usually found in all stool specimens, this being a normal finding in this community.

Faecal fat estimation in five patients averaged 10.2 g/100 ml with a range of 7.8 to 17.2 g/ml of stool. Jejunal biopsy in two of these patients with malabsorption showed evidence of moderate atrophy of the villi and prominent lymph channels.

The Heaf test was positive to grades III and IV in only three out of the 20 patients, but this low positive result may largely be accounted for by poor technique.

Radiology

CHEST RADIOGRAPHS

All the 20 cases showed radiological evidence of previous pulmonary tuberculosis either as calcification in one or both hilar regions or calcification in the apical regions. There were six cases with radiological evidence suggestive of active pulmonary disease although only one patient had tubercle bacilli recovered from the sputum. The six cases showed one of the following radiological appearances: pleural effusion in association with bronchopneumonia; right upper lobe consolidation; left upper lobe cavity with thick walls; left upper lobe consolidation with scarring; bilateral linear basal atelectasis; left lower lobe consolidation in association with dilated lymphatics at the bases as well as surgical emphysema in the right chest wall.

RADIOLOGICAL CHANGES IN THE ABDOMEN

Plain films

Ten patients out of 18 patients had plain abdominal radiographs taken. Four patients had normal abdominal radiographs. Ascites was in two patients, one with multiple fluid levels in the small bowel. This patient later had a malabsorption pattern on the barium meal study. Dilated loops of small bowel were seen in four cases, one of which showed multiple fluid levels in a ladder pattern suggesting obstruction.

Barium findings

Barium meal and small bowel examinations were performed in 11 cases only. Five cases showed evidence of malabsorption (dilatation, flocculation, moulage sign, and increase in transit time). Marked narrowing of the duodeno-jejunal flexure with a fistula between

the jejunum and the transverse colon was present in one case while five others were negative.

Barium enema

This proved to be the most informative single radiological examination, demonstrating the site, length, and appearances of the lesions. All cases involved either the ileum or the colon or both except one case which involved both the duodeno-jejunal flexure and left half of the colon.

The sites of lesions in the 18 cases examined by barium enema were as shown in Figure 1.

Therefore, the disease is usually a right-side colitis, the ileocaecal region being the favoured site of disease; the lesions decrease in frequency as the left half of the colon is approached.

DESCRIPTION OF COLONIC LESIONS

Four main types of lesions were observed in the series.

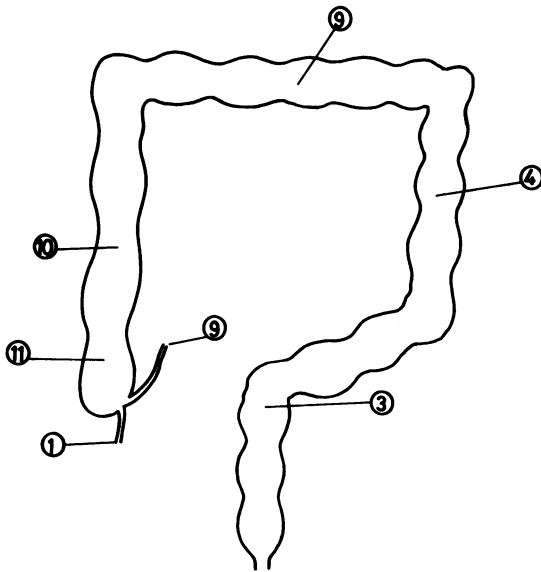


Fig. 1 Diagram showing the numerical distribution of lesions in the terminal ileum and the colon.

Small bowel	..	..	..	..	6
Terminal ileum	..	..	..	..	9
Caecum	..	..	..	..	11
Appendix	..	..	..	..	1
Ascending colon	..	..	..	..	10
Transverse colon	..	..	..	..	9
Descending colon	..	..	..	..	4
Sigmoid colon	..	..	..	..	3

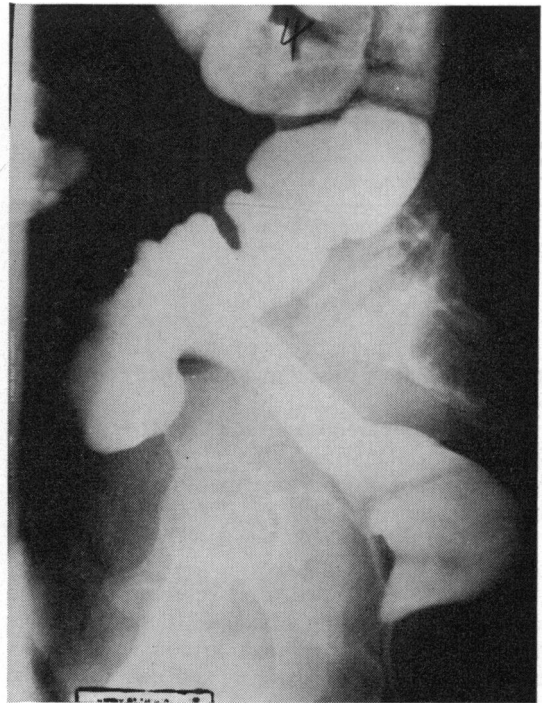


Fig. 2a

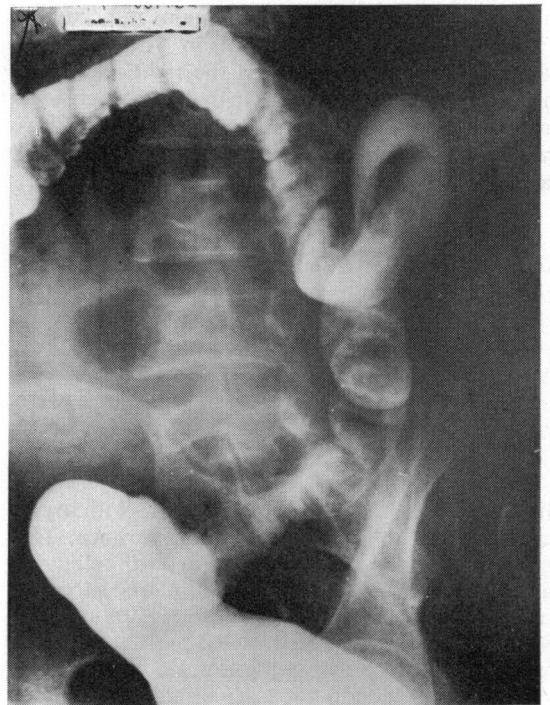


Fig. 2b

Fig. 2 'Pipe-stem' appearance with narrowing of the sigmoid colon (a) and the splenic flexure (b).

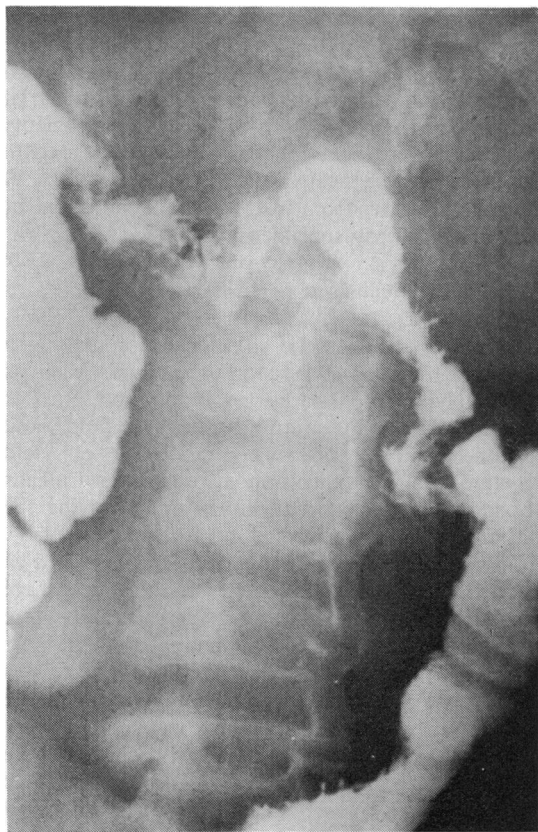


Fig. 3

Fig. 3 *There are very marked ulcerations of the transverse and descending colon.*



Fig. 4

Fig. 4 *There are irregularities and narrowing of the terminal ileum. The caecum and the ascending colon are contracted. Note the ulcers around the caecum (arrow).*

1 The hyperplastic type with a long contracted region of narrowing with loss of distensibility, the so-called pipe-stem colon as shown in Fig. 2a and 2b. This is the commonest type of lesion encountered in about 13 cases. When the narrowing involved the terminal ileum, there was usually dilatation of the more proximal small bowel.

2 The ulcerative type with areas of marked ulceration as shown in seven of our cases, three of which were associated with the hyperplastic type of lesion (Fig. 3).

3 The lesions can also be mixed showing a combination of the hyperplastic and the ulcerative types (Fig. 4).

4 The carcinoma-like type with a short annular filling defect and irregular walls with overhanging edges mimicking carcinoma and may present as complete obstruction. This type is relatively uncommon, occurring in two cases where it was asso-

ciated with the hyperplastic variety (Fig. 5).

5 Other types of lesions found include one case with fistula formation between the jejunum and the transverse colon, one of intussusception (Fig. 6), one with an appendicular mass, and one with extensive diverticulosis (Fig. 7a and 7b).

The extent of the lesions as shown radiographically varied considerably. In six cases the lesion extended from the terminal ileum to the ascending colon and in another two patients it extended to the transverse colon. In two cases the lesion extended from the caecum to the descending colon. Left-sided abdominal lesions occurred in such sites as the splenic flexure in three patients and in the sigmoid colon in three others.

Although most of the lesions were unifocal, multiple (segmental) lesions also occurred with radiologically normal areas in between the lesions in four cases. This is reminiscent of Crohn's disease.

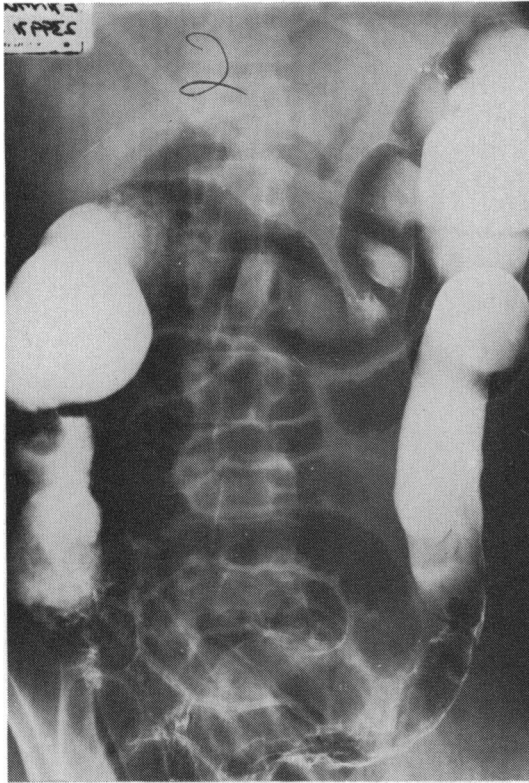


Fig. 5 There is loss of distensibility of the caecum, the ascending colon, the hepatic flexure, and the distal portion of the descending colon which has a 'pipe-stem' appearance. An annular filling defect with overhanging edges is seen at the mid-portion of the ascending colon.

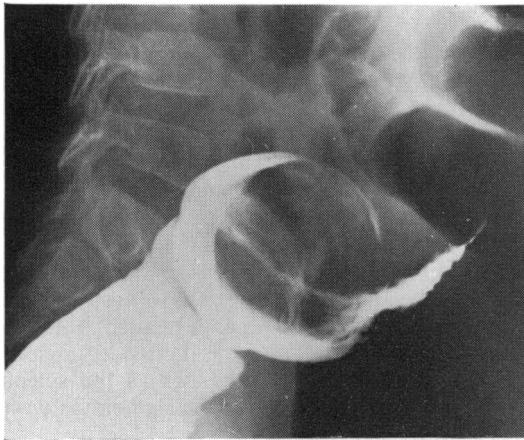


Fig. 6 Round filling defect within sigmoid colon, obstructing the flow of barium. Note the gaseous dilatation of the colon proximal to this. An intussusception was found at operation.

Diagnosis was made in three cases on clinical grounds based on the grade II positive Heaf test, suggestive radiological changes in the ileocaecal region, and a positive response to therapeutic trial with Pasinah cachets. One of these three patients also had positive sputum tests for acid-fast bacilli. Confirmatory diagnosis, however, was obtained in the other 17 cases from histological examination of each of the biopsy specimens.

Pathological Findings at Laparotomy

Laparotomy remains the sole means of making a definitive diagnosis where other methods such as external lymphadenopathy for biopsy, presence of acid-fast bacilli in sputum or ascitic fluid, and peritoneal biopsy are not practicable or yield negative results. Laparotomy also provides a means of examining the internal viscera and studying the pathology. It was performed in 11 of the patients.

In most of the cases, the intestine was found to be studded with yellowish tubercles and nodules; there were many adhesions between small and large intestine. In some cases the abdominal contents were adherent to the anterior abdominal wall. There was frequently a firm granulomatous mass involving the caecum and ascending colon, which had very restricted mobility. Exuberant fat deposits were found on the colon and caecum. In one case there was an abscess cavity around the caecum and appendix. The mesentery was usually studded with enlarged caseating glands and one of these glands was usually taken for histological diagnosis.

Discussion

The number of cases under review does not reflect the extent of the prevalence of the disease in the community since it is limited to cases with radiological proof of intestinal involvement. According to Blumberg (1928), 70-80% of the advanced intestinal tuberculosis cases show radiological changes whereas only 5 to 8% of cases with minimal lesions show radiological changes. However, tuberculosis of the distal colon without any radiological evidence does occur and could be diagnosed by sigmoidoscopy, biopsy, and culture of the biopsy material (Need and Behnke, 1962). By this method many more cases of early tuberculosis of the intestine could be diagnosed (Martin, 1932).

All the cases of tuberculosis of the intestine in this study showed evidence of active or healed pulmonary tuberculosis. Of the six cases with active lesions, five of them had evidence of parenchymal lung disease and only one with pleural involvement. Ukil (1942), Bockus (1964) and Recio (1961) found 95% of their

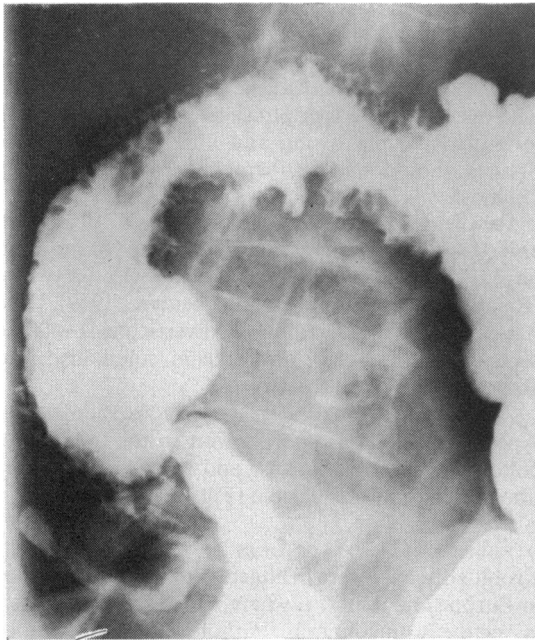


Fig. 7a

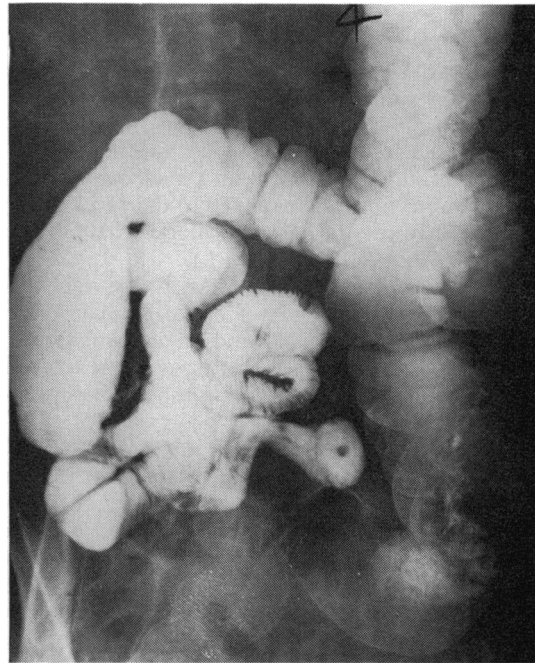


Fig. 7b

Fig. 7a *Gross irregularity of the large bowel from the caecum to the splenic flexure, with the barium extending outwards in rows. Each extension ends in a little pin-head pool (diverticulum).*

Fig. 7b *The diverticula disappeared on therapy but the mucosa of the colon was permanently lost, leaving a 'pipe-stem' colon.*

cases of intestinal tuberculosis were secondary to pulmonary disease and that primary intestinal tuberculosis was rare, while others like Davis (1933), Anand (1956), and Ashken and Baron (1962) found the majority of their cases had no pulmonary lesions. It is generally believed that the incidence of tuberculosis of the intestine varies in direct proportion to the severity of the coexisting pulmonary disease (Bellinger, 1937; Cullen, 1940; Mitchell and Bristol, 1954) and this may be of importance in determining the relative incidence of primary to the secondary type of the intestinal disease. Human rather than bovine tubercle is prevalent in this part of the country, and this makes the secondary intestinal form more probable. It is generally assumed that secondary intestinal tuberculosis results from the continuous swallowing of sputum containing *M. tuberculosis*. In accordance with other reports (Rankine, 1952; Anscombe, Keddie, and Schofield, 1967; Chawla, Mukerjee, and Berg, 1971) there is a higher incidence between the ages of 20 and 40 years.

The clinical features in our series conform to those already reported in a large study by Anand (1956) and consist of abdominal pain, fever, weight

loss, diarrhoea, and general deterioration in health. Secondary anaemia, a WBC of rarely up to 12 000, steatorrhoea, hypoproteinaemia, and a high protein content of ascitic fluid with a high lymphocyte count and sterile culture are the usual laboratory findings.

Although there were two cases with ascites in this series, many of our other cases of tuberculosis of the abdomen, not included in this study because of the absence of radiological studies, presented with ascites. Abdominal tuberculosis with ascites accounts for 24% of all adult patients presenting with ascites (Nwokolo, 1967). Such cases may arise from activation of a long latent tuberculous focus in the peritoneum (Nice, 1950). However, it is also possible that some arise as complications of intestinal tuberculosis, especially the glandular type (Edington and Gilles, 1969).

Chronic diarrhoea occurred in 80% of our cases, the stool being soft and containing no blood. *Ascaris*, *trichuris*, and hookworm ova were often present and the finding is common in people of this socio-economic class. Although rectal bleeding has been reported (Abrams and Holden, 1964; Anscombe *et al*, 1967) this has not been observed in our series.

Malabsorption of fat occurred in five of our 20 patients two of whom showed the features of 'adult kwashiorkor'. A similar clinical picture of this disease was also described by Schuurmans and Stekhoven (1965). The combination of the malabsorption due to the tuberculous infection against the background of poverty and inadequate intake of protein may have contributed to the development of the features of protein-calorie malnutrition (Lewis, 1970).

A generalized or localized mass in the right iliac fossa was found in 55% of cases. Similar figures have been reported by Anand (1956) and Bockus (1964). It is remarkable that a mass in the left side of the abdomen is uncommon in tuberculosis of the intestine.

The location of the lesion in our series supports the view of Anand (1956) and Abrams and Holden (1964) that the commonest site of involvement is the ileo-caecal region in the right side of the abdomen. However, lesions in the distal colon were also encountered: there were 10 lesions in the ascending colon; nine in the transverse colon, four in the descending colon, three in the splenic colon, and three in the sigmoid colon. Such distal lesions in the left side of the abdomen have been reported to be rare and are the subject of isolated case reports (Rhoades, Klein, and Welsh, 1960; Angelchik *et al*, 1962; Abrams and Holden, 1964; Bentley and Webster, 1967). It is also remarkable that in two of our cases the entire colon was involved. Chawla *et al* (1971) remarked that 77 cases of segmental tuberculosis of the distal colon had been recorded in the British literature up to the time of their report and they added 10 more cases of their own. There were four cases of segmental lesions in our series.

The commonest type of tuberculous ileo-colitis observed in this series is the hyperplastic involving several anatomical regions of the colon continuously, mainly the terminal ileum, the caecum, and the ascending colon. Our series appears to be florid as judged by the gross appearances, the vast lengths of gut involved, and the frequency of the involvement of the terminal ileum. The terminal ileum is thought to be involved by retrograde infection as the ileo-caecal valve is usually incompetent.

The radiographic appearances are in the main those of narrowing and fibrosis causing the caecal region to be drawn up towards the right hypochondrium. Transverse fissures of the colon, which are multiple ulcers arranged in parallel rows at right angles to the lumen of the gut and measuring from 2 mm to 6 mm in length, occurred in over 35% of cases thus making this feature very important for diagnosis. However, these fissures or ulcers can also occur with Crohn's disease but they are fewer in

number and shorter in length.

Tuberculous colitis may closely mimic carcinoma of the colon in its radiological appearances. About 10% of our cases showed the annular type of lesion with overhanging edges. However, its association with long areas of narrowing and fibrosis or transverse fissures should make tuberculosis the more likely diagnosis.

Lesions with predominant mucosal ulceration and diverticular formation were also found and have presently been reported as being very rare (Emanuele, Bignamini, and Ferraro, 1969). The patient with the intramural diverticulosis of the ascending, transverse, and splenic colon also had active pulmonary tuberculosis.

After medical treatment, the various radiological types of tuberculous colitis revert to the 'pipe-stem' colon with the haustra lost and the muscular layer fibrosed and not distensible (Fig. 7b).

DIFFERENTIAL DIAGNOSIS

Crohn's disease is rare in Nigeria but much commoner in Europe and America where intestinal tuberculosis is relatively uncommon. Pathologically and radiologically both diseases have much in common and are often difficult to differentiate (Lee and Roy, 1964; Howell and Knapton, 1964; and Brenner, Annes, and Parkas, 1970). Contraction of the terminal ileum and caecum (Stierlin's sign) as well as 'skip' areas of pathology within the colon and ileum are also seen in tuberculous enteritis (Stassa, 1967). Brombart and Massion (1961) believe that differentiation between tuberculosis of the intestine and Crohn's disease can be made radiologically. Also what appeared radiologically as 'skip areas' with normal appearances in between two sites of lesions is not the sole criterion of Crohn's disease; it can also occur in tuberculosis of the intestine. The terminal ileum is affected in advanced cases of tuberculosis (Anscombe *et al*, 1967) but is also a usual occurrence in Crohn's disease. Histologically, the serosal nodules of Crohn's disease consists of non-caseating granulomata with giant cells of Langhan's type. Caseation is exceptional in Crohn's disease whereas it is the characteristic feature of tuberculosis. The granulomata of Crohn's disease are bacteriologically sterile while those of tuberculosis usually yield tubercle bacilli on culture or guinea pig inoculation.

Amoeboma is a common cause of a mass in the right iliac fossa in Nigeria. It involves the caecum, the rectum, ascending colon, and sigmoid colon in that order of frequency (Pain, 1971) but radiologically the affected parts show a smooth narrowing construction, or plaque-like filling defects. Shallow ulcers may be present in the acute stage but no fissures or fistula formation are seen.

Carcinoma of the colon, although not as common as in the western countries, does exist in Nigerians (Edington and Easmon, 1967). Radiologically the terminal ileum is rarely affected and the appearance is usually annular with overhanging edges. The lesions are generally unifocal, with the rest of the colon remaining free from disease unlike the situation in tuberculosis.

Schistosoma mansoni infestation of the lower bowel may present as intestinal tuberculosis with abdominal pain, abnormality of bowel action, and chronic diarrhoea, which, unlike intestinal tuberculosis, is often associated with bloody stools. The lesion is often a polypoidal or constricting lesion in the rectosigmoid region and demonstrable by endoscopy (Francis and Wright, 1971).

Other lesions with similar clinico-radiological features include lymphoma of the intestine, non-specific granulomatous ileo-colitis, and vascular occlusive disease, which is uncommon in the Nigerians. Biopsy of the lesions in these conditions provide a basis for histological diagnosis.

The complications encountered in our series include ascites in six of the patients; one with intestinal obstruction; one with fistula formation between the jejunum and transverse colon; appendicular abscess formation, and one case with enterolithiasis which has been reported to be rare by Chawla *et al* (1966). Other well known complications include haemorrhage and perforation. There was no case of perforation in this series. This is probably due to the chronicity of the disease process and the tendency to fibrosis and formation of adhesions.

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