Caecal tuberculosis

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EDITORIAL COMMENT This paper demonstrates that caecal tuberculosis must be kept in mind as a differential diagnosis of carcinoma. The patients described in this series all had the hypertrophic type with maximum involvement at the caecum and with the terminal ileum involved early in advanced cases.

Hypertrophic ileo-caecal tuberculosis was often diagnosed on clinical grounds in the last century, but it was subsequently realized that many granulomata of this type were not of tuberculous origin (Moschowitz and Wilensky, 1923). The description of regional ileitis (Crohn, Ginzburg, and Oppenheimer, 1932) raised further doubts about the incidence of hypertrophic ileo-caecal tuberculosis; in fact, Warren and Sommers (1948) stated that regional ileitis included so many cases of the 'so-called ileo-caecal tuberculosis' that this term was practically obsolete. Further support for this view was provided when specimens preserved in museums and listed as 'hypertrophic ileo-caecal tuberculosis' proved on further histological examination to be cases of Crohn's disease, so that by 1959, Bruce could state that 'the lesion commonly known as hypertrophic ileo-caecal tuberculosis seems to have disappeared'.

Although this statement expressed the general opinion in Britain, in countries where tuberculosis was still rampant, cases showing the typical pathological changes were still recorded. From India, Anand (1956) described 50 cases of ileo-caecal tuberculosis and in more than half these cases *Mycobacterium tuberculosis* was cultured from the lesion or the regional lymph nodes. From Hong Kong, Stock and Li (1964) discussed the problem of ileo-caecal granulomata and included a case of ileo-caecal tuberculosis, but Stock (1964) noted that 'the very considerable number were decreasing over the years as tuberculosis became more and more under control'. There may be racial differences in the sites affected by tuberculosis, for Barst (1965) in the Sudan described tuberculosis of bone as extremely common and yet had only seen one case of ileo-caecal tuberculosis in 14 years.

Our interest was stimulated by treating three patients with tuberculous involvement of the caecum in a short period of time.

Hoon, Dockerty, and Pemberton (1950) have stressed the importance of a basis for the diagnosis of tuberculosis and laid down the following criteria: (a) histological evidence of typical tubercles with central caseation; (b) demonstration of acid-fast organisms; (c) proof that the organism is *Mycobacterium tuberculosis* by culture or animal inoculation.

In a review of 156 cases of large and small bowel granulomata seen in the Manchester Royal Infirmary over the period 1949-1962 (Schofield, 1965), we found six patients in addition to the three cases mentioned above with lesions which fulfilled one or more of these diagnostic criteria. The lesions in every case were in the caecum or ascending colon and in this series no patient was found with a tuberculous granulomatous lesion of the small or the remainder of the large intestine.

Two other patients showed similar caecal lesions, but no caseation was found on histological examination, and in neither case was a search made for *Mycobacterium tuberculosis*. Whilst it is possible that these cases may have been tuberculous, we have no evidence of this, and they have been excluded from this series.

This group of nine patients has similar features to constitute a distinct syndrome of caecal tuberculosis which should be differentiated from 'hypertrophic ileo-caecal tuberculosis' and from Crohn's disease (Schofield, 1965).

CASE REPORTS

CASE 1 Mrs. C.B., aged 88 years, was admitted as an emergency with frequency of micturition and dysuria for one month. She gave a history that in the previous three months she had become giddy when attempting to stand so she took to her bed. She began to lose her appetite and rapidly lost weight. One month before admission she developed a constant lumbar ache and epigastric pain

associated with increased constipation, the bowel being opened every other day. She denied any melaena and there was no significant previous medical history.

Examination showed her to be a pale, emaciated old lady. There was a smooth mobile mass in the right iliac fossa, 6 cm. in diameter.

Investigations Haemoglobin was 7.4 g./100 ml. A catheter specimen of urine showed numerous pus cells and culture yielded a growth of *Proteus morgani*. Chest radiography showed normal lung fields.

The day after admission she passed approximately a pint of fresh blood per rectum, though her general condition remained unchanged. She was given 4 pints of blood. She started to have diarrhoea, passing four to five motions per day, but without blood, and five days after admission her temperature rose to 100°F. The abdomen became distended, with tenderness and guarding over the mass in the right iliac fossa. A provisional diagnosis of carcinoma of the caecum with local peritonitis was made and she was treated with antibiotics and sulphathalidine. Ten days after admission she passed more fresh blood per rectum, and became shocked, necessitating further blood transfusion and urgent laparotomy.

At operation there was a large mass in the caecum with local inflammatory reaction and free fluid in the peritoneal

cavity. The terminal ileum was normal and there were no enlarged lymph nodes. A right hemicolectomy with end-to-side anastomosis was performed.

Post-operatively she remained fairly well for several days, but on the fifth day she became dyspnoeic and sacral oedema was noticed. She slowly deteriorated and died on the eighth post-operative day of bilateral bronchopneumonia and congestive heart failure. In the post-operative period stool examination showed tubercle bacilli.

Macroscopic examination of the specimen showed a mass of apparent tumour in the caecum with ulceration of the mucosal surface.

Histological examination showed typical tuberculous lesions in the caecum and tubercle bacilli were demonstrated in large numbers in the caecal wall (Fig. 1). Regional lymph nodes also showed tubercles. The terminal ileum was normal.

At post-mortem examination, the only evidence of tuberculosis was a few tubercles on the surface of the liver and a few in the substance of the spleen. Extensive examination of the lungs showed bilateral bronchopneumonia, but no evidence of tuberculosis. Sections of the organs, including the kidney, showed no evidence of tuberculosis.

FIG. 1. Case 1. Photomicrograph of caecal wall. Ziehl-Neelsen staining. Mycobacterium tuberculosis is seen as clusters of rods.

FIG. 2. Case 2. Barium enema showing shortening and narrowing of the ascending colon and a loss of the normal angle between the terminal ileum and caecum.

CASE 2 A 73-year-old woman, Mrs. E.E., gave a history of weight loss and anorexia for all types of food for six months. She admitted to increasing constipation but denied any pain. There was no significant previous medical history. Examination revealed a pale old lady who had obviously lost weight. There was a hard mobile mass palpable in the right iliac fossa.

Investigations Haemoglobin was 11.7 g./100 ml.; W.B.C.s 5,300. A barium enema showed the caecum and ascending colon to be shortened and narrowed to form a short, rigid tube and this was interpreted as extensive involvement by carcinoma of the caecum (Fig. 2). A radiograph of the chest showed minimal cardiac enlargement, calcification of the aortic arch, and normal lung fields. Repeated examinations of the stool for occult blood were negative.

At operation the caecum was found to be thickened and indurated, and although the findings were not typical of carcinoma, a right hemicolectomy with an end-to-side anastomosis was performed. The terminal ileum was normal and there was no enlargement of the regional lymph nodes.

She made an uneventful recovery and has remained well for two years without further treatment.

The specimen showed thickening of the caecal wall with several small, shallow mucosal ulcers. Histological examination showed typical tuberculous follicles in the submucosa with central caseation in areas of epithelioid cells with tuberculous giant cells and a peripheral zone of lymphocytes. The lymph nodes showed only reactive hyperplasia.

CASE 3 Mrs. E.C., aged 37 years, was seen with a history of aching in the right iliac fossa, with alternating constipation and diarrhoea, but no blood in the motions, for six months. She was easily tired, had been losing weight for three months, and a month previously she had noticed a mass in the right iliac fossa. There was no other relevant history.

On examination, she was an intelligent woman who was obviously anaemic. Examination of the abdomen revealed a mass in the right iliac fossa, which was hard and not tender; it measured 5 cm. by 3 cm.

Investigations Haemoglobin was 11.8 g./100 ml. A chest radiograph showed a calcified focus in the left upper lobe. Sputum culture was negative for tubercle bacilli on three occasions. Barium enema and barium meal with follow-through showed a large filling defect in the ascending colon below the hepatic flexure, the terminal ileum being normal.

At operation, a mass involving the caecum and ascending colon was found and the lymph glands in the small bowel mesentery were enlarged. The terminal ileum was normal. A right hemicolectomy was performed.

A specimen showed that the terminal ileum appeared normal, but distal to the ileo-caecal valve there was a large grey mass in the caecum and ascending colon 10 cm. in length; the wall was thickened and the mucosa atrophic.

Microscopy showed infiltration of the gut wall with tuberculous granulomata showing caseation. Local glands contained tubercles with caseation.

Post-operatively the patient made a good recovery and was started on antituberculous therapy with streptomycin and isonicotinic acid hydrazide which was continued for six months. At the end of this time she had gained 3 stones in weight.

She is alive and well without symptoms 10 years later.

CASE 4 J.B., a woman aged 45, gave a three months' history of weight loss, central abdominal colicky pain associated with loose stools containing mucus, but no blood, which were passed several times a day. There was no other relevant history.

On examination she appeared to have lost weight. Examination of the abdomen showed tenderness in the right iliac fossa but no definite mass was palpable.

Investigations Haemoglobin was 12.1 g./100 ml. A barium enema showed an irregular stricture of the ascending colon with persistent deformity and contraction of the caecum. A chest radiograph was normal. No tuberculous organisms were found on examination of the sputum.

At operation the caecum was found to be enlarged by a soft intraluminal mass, the terminal ileum being normal. A right hemicolectomy was performed.

In the specimen there was an annular constriction in the lower part of the ascending colon, the surface being dark red and granular. Microscopy of the stricture showed tubercle formation with caseation and giant cells, but no tubercle bacilli were seen on Ziehl-Neelsen staining.

Post-operatively the patient made a good recovery and was well eight years later.

CASE 5 W.D., a 41-year-old man, gave a history of central abdominal colicky pain for one month associated with loose, frequent bowel motions with occasional frank blood. His appetite was poor and he had lost weight. On the day of admission the pain became more severe, localized in the right iliac fossa, and he vomited twice. He was known to have open pulmonary tuberculosis.

Examination showed a very ill man who was emaciated; he had a temperature of 99°F. (37.2°C.). Abdominal examination revealed a tender mass in the right iliac fossa.

Investigations A chest radiograph showed cavitating caseating tuberculosis at the left apex. Sputum was positive for tubercle bacilli.

Operation was performed as an emergency. A normal terminal ileum and appendix were found, but there was a mass involving the caecum. It was felt that this was an acute inflammatory process and definitive resection was contraindicated in view of the general condition of the patient. His condition slowly deteriorated and he died three days post-operatively.

At necropsy there was caseating tuberculosis at the apex of the left lung. There was a mass in the caecum with central ulceration.

Microscopy showed typical tubercles with caseation, but staining by the Ziehl-Neelsen method did not demonstrate any mycobacteria.

The small intestine was normal, and the local lymph nodes showed reactive hyperplasia only.

CASE 6 Mrs. W.H., aged 47, gave a 12 months' history of attacks of diarrhoea, alternating with constipation. She had noticed blood in the faeces on several occasions. In the previous three months she suffered attacks of colicky lower abdominal pain and said she had lost more than a stone in weight. Examination showed her to be thin but not obviously anaemic. She was tender in the right iliac fossa but there was no palpable mass.

Investigations Haemoglobin was 13.3 g./100 ml. A chest radiograph showed no abnormality. A barium enema showed a filling defect in the caecum thought to be carcinomatous.

At operation the caecum was found to be thickened with reddening of its serosal surface. The ileum was normal and the regional nodes showed slight enlargement. Right hemicolectomy was performed.

The specimen showed general thickening of the wall of the caecum with ulceration of the mucosa.

Microscopy of the lesion showed typical tubercles with central caseation. The regional glands were not examined.

She made an uneventful recovery, and is well 12 years later without further treatment.

CASE 7 Miss A.D., aged 27 years, gave a four-year history of vague lower abdominal pain. In the last six months she had noticed that this had become worse and was associated with continuous diarrhoea, gross anorexia, and 3 stones loss in weight. Examination showed that she was an intelligent woman and was grossly emaciated. There was a tender mass some 2 cm. in diameter in the right iliac fossa.

Investigations Haemoglobin was 9.1 g./100 ml. A chest radiograph was normal. In the faeces tests for occult blood were positive. Sputum examination was negative for tubercle bacilli. A barium meal showed no abnormality in the oesophagus, stomach, duodenum, or small bowel. A barium enema showed a distorted and irregular caecum and a shortened ascending colon, thought to be due to either carcinoma of the caecum or Crohn's disease.

At operation there was a soft mass occupying the caecum and spreading into the ascending colon. The terminal ileum was normal. There were several enlarged glands in the mesentery. A right hemicolectomy was carried out.

The specimen showed gross thickening of the caecal wall spreading into the ascending colon with a 3 cm. central ulcer. The histology of the lesion showed typical tuberculous granulation tissue with central caseation. The lymph glands showed similar changes.

Three months later she was readmitted with intestinal obstruction which at operation was found to be due to adhesions. No active disease was found at the site of the previous anastomosis. She died three days later of electrolyte unbalance.

CASE 8 Mrs. R.S., aged 40 years, gave a 12 month history of attacks of bloody diarrhoea associated with central abdominal pain. In the previous month the pain had moved to the right lower abdomen and she had vomited on occasions. She had lost 2 stones in weight.

Examination showed a thin woman with a tender mass about 2 cm. by 3 cm. in the right iliac fossa.

Investigations Haemoglobin was 10.2 g./100 ml. A chest radiograph showed a normal heart and clear lung fields. Barium enema showed deformity and narrowing of the caecum, thought to be carcinomatous.

At operation the whole of the caecal wall was thickened and there was a rather soft mass, which involved the posterior caecal wall. There were no enlarged regional glands. A right hemicolectomy was carried out.

The specimen showed an ulcerated lesion 4 cm. by 3 cm. on the posterior wall of the caecum.

On microscopy there were typical tubercles with central caseation; the local lymph nodes showing only reactive hyperplasia.

She made an uneventful recovery and is now alive and well eight years later.

CASE 9 Mr. F.A.S., aged 25, a Pakistani who had been in England for two years, gave a history of attacks of right paraumbilical pain over the previous three years. The pain was constant in intensity, lasted about 12 hours, but only occurred three or four times a year initially. In the last two months he had had two attacks of pain which had spread to the right loin. He had lost his appetite in the previous four months and had lost about 1 stone in weight. There was no vomiting, diarrhoea, or constipation. He had no other symptoms.

Examination showed an apparently fit man with a tender mass about 4 cm. in diameter in the right upper abdomen.

Investigations Haemoglobin was 15.8 g./100 ml. A chest radiograph showed normal heart and lungs. An intravenous pyelogram, cholecystogram, and barium meal were all normal. A barium enema showed a vertically disposed ileum but an apparently normal caecum and ascending colon. There was occult blood in the faeces.

A pre-operative diagnosis of hypertrophic caecal tuberculosis was made.

At operation the mass proved to be enlarged glands in the ileo-caecal angle. The caecum had a localized area of thickening below the ileo-caecal valve on the postero-medial wall. A right hemicolectomy was carried out. He made an uneventful recovery and is alive and well one year later.

The specimen showed a deep ulcer 2 cm. in diameter on the postero-medial wall of the caecum. In the pericolic fat there was a mass of glands varying in size up to 2 cm. in diameter.

Specimens were sent from the ulcer and the gland mass for bacteriological examination. Those from the glands had acid-fast organisms on direct smear and culture of this and the specimen from the ulcer grew mycobacterium tuberculosis.

Microscopy showed that the floor of the ulcer was formed by tuberculous granulation tissue in which there were several typical tubercles. The surrounding mucosa contained many typical tubercles, some of which showed caseation.

The lymph nodes showed extensive tuberculous caseation and an occasional tubercle bacillus was seen on Ziehl-Neelsen staining.

CLINICAL FEATURES

SEX AND AGE Seven of the nine patients in this series were women, giving a sex ratio of 3.5:1. Despite the small number in the series, this difference is likely to be significant, for in a series of 50 patients Anand (1956) found a similar preponderance in women with a ratio of female to male of 3.16:1. The disease affects all ages and the fact that two patients were aged 73 and 88 years reflects the incidence of senile tuberculosis in this country.

HISTORY Five patients gave a history of six months or less and the deterioration in general health was rapid, weight loss and anaemia being a constant feature in all patients. Abdominal pain was another common symptom, being present in eight of the nine patients whereas it was present in all the cases reviewed by Anand (1956).

A change in bowel habit occurred in all but one of our patients. In seven patients there was diarrhoea at some stage of the illness, though this was only constantly present in four of them. Five of the nine patients had obvious blood in the faeces.

EXAMINATION

On physical examination, a mass was felt in the right iliac fossa in eight of the nine patients. In seven of the nine patients a provisional clinical diagnosis of carcinoma of the caecum was made. The exceptions were the only two males in the series: one of these patients was known to have cavitating pulmonary tuberculosis and was operated on as an emergency for acute abdominal pain, the other patient was a Pakistani in whom the correct diagnosis was made pre-operatively.

Although many of the symptoms and signs are common to both caecal tuberculosis and carcinoma, certain clinical features may assist in the differentiation between the two conditions: (1) the more rapid development of weight loss and anaemia in the patient with caecal tuberculosis, compared with the patient with a caecal carcinoma who has no hepatic metastases; (2) in caecal tuberculosis the palpable abdominal mass is tender and is softer and smaller than one would expect with a carcinoma when the poor general condition of the patient is taken into consideration.

INVESTIGATION

RADIOLOGY Seven patients investigated by a barium enema before operation showed an abnormal appearance of the right colon, which was interpreted as being due to a carcinoma. When the films were

FIG. 3. Diagram illustrates the changes produced by caecal tuberculosis as seen in barium enema. The caecum disappears and the ascending colon is shortened and narrowed. The ileum is normal in appearance but passes vertically into the large bowel.

reviewed we observed certain features which may help to establish the correct diagnosis (Aird, 1949; Stock and Li, 1964): shortening of the ascending colon and the caecum; loss of the normal ileocaecal angle so that the ileum appears to run straight into the caecum; absence of obstruction of the terminal ileum (Fig. 3).

A barium follow-through examination did not add any new information beyond that gained from a barium enema, except to demonstrate the normal appearance of the terminal ileum.

Radiology of the chest was of no assistance in establishing a correct diagnosis, for in the nine patients examined only two had abnormal radiographs: one was already known to have an open pulmonary lesion (case 5) and the other showed a healed left apical lesion (case 3).

EXAMINATION OF SPUTUM AND FAECES Ashken and Baron (1962) reported ulceration of the terminal ileum and caecum in a Cypriot male who had a normal chest radiograph but whose sputum grew a culture of *Mycobacterium tuberculosis*. Examination of the sputum for tubercle bacilli in our cases was negative in all except for the one open case already mentioned. Examination of the faeces for tubercle bacilli was only undertaken in two of our patients and it was positive in one of them. This suggests that the investigation can be useful.

TREATMENT All patients were subjected to laparotomy and a right hemicolectomy was performed except for a patient whose general condition precluded an extensive operation. Even when the mass could be directly inspected and palpated the correct

diagnosis was not made and the lesion was thought to be a carcinoma of the caecum or ascending colon. The surgeon may be further misled by finding enlarged regional lymph nodes, which are often white, like those affected by secondary deposits. The normal appearance of the terminal ileum is a further misleading feature to a clinician taught that hypertrophic tuberculosis affects the terminal ileum and the caecum.

Right hemicolectomy appears to be the correct treatment for this condition. Seven patients survived the operation and six have remained well since, the period of follow-up being from one to 12 years.

In our series, no definite policy was followed on the use of antituberculous drugs. Two of the six long-term survivors had the appropriate drugs with no apparent advantage over the four patients who received no chemotherapy.

DISCUSSION

It has been recognized for many years that tuberculosis of the alimentary tract can occur in either an ulcerative or a hypertrophic form. The ulcerative type, usually but not invariably associated with pulmonary tuberculosis, has declined in incidence in recent years (Mitchell and Bristol, 1954) but its existence has never been in doubt. The incidence of hypertrophic ileocaecal tuberculosis has been the subject of dispute since the description of regional enteritis in 1932 (Crohn *et al.*, 1932) but it is evident that the condition still exists and that the incidence varies with the rate of tuberculosis in the community. The recent increase in case reports from this country (Lee and Roy, 1964; Howell and Knapton, 1964) can be related in part to tuberculosis in the immigrant population.

Nevertheless, the use of the term 'hypertrophic ileocaecal tuberculosis' appears to cause some confusion, for granulomatous lesions in the ileocaecal region can be due to tuberculosis, Crohn's disease, actinomycosis, amoebiasis, and appendicular inflammation. In certain cases the differentiation between those conditions, particularly on histological grounds, can be a matter of opinion and dispute (Lee and Roy, 1964).

It is apparent that the term ileocaecal tuberculosis includes the conditions known as 'hypertrophic ileocaecal tuberculosis' and tuberculous enteritis and that these conditions are often considered together as a single clinical entity. Howell and Knapton (1964) described 13 patients suffering from ileocaecal tuberculosis seen in the Birmingham area in the period 1951-62 but do not differentiate between the two conditions.

The features of tuberculous enteritis have long

been recognized. The disease occurs commonly in patients with pulmonary tuberculosis and produces shallow ulcers which are often multiple and in the small intestine, which may heal producing narrow strictures.

All the cases described in this series are of the hypertrophic type. Examination of the excised specimen has shown that the caecum is the site of maximal involvement with secondary affection of the regional lymph nodes. The terminal ileum seems to be involved only in advanced cases and possibly as a retrograde rather than a primary infection. Infection and ulceration of the Peyer's patches, as occurs in tuberculous enteritis, does not seem to occur.

We have suggested above that caecal tuberculosis has features which can lead the clinician to reach the correct diagnosis. The rapid deterioration in the patient with a palpable mass in the right iliac fossa should lead to a diagnosis of caecal tuberculosis or Crohn's disease rather than of carcinoma, while the findings by barium enema examination should then differentiate between these two conditions.

Thus, on clinical and pathological evidence we suggest that this condition should be known as 'caecal tuberculosis' and that the use of the term 'hypertrophic ileocaecal tuberculosis' should now be discontinued.

SUMMARY

In recent years doubt has been cast on the incidence in Britain of the condition known as 'hypertrophic ileocaecal tuberculosis'. It is clear that ileocaecal tuberculosis still occurs in the underdeveloped countries but many cases previously diagnosed as this condition have now been proved to be cases of Crohn's disease. In a review of granulomata of the large and small bowel we have found nine cases of caecal tuberculosis. The clinical features and pathology of this condition are discussed and it is suggested that the lesion arises truly in the caecum and spreads only as a secondary feature to involve the terminal ileum. To avoid confusion in the future we suggest that the term 'ileocaecal tuberculosis' should be discontinued and 'caecal tuberculosis' be substituted.

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