LOCALIZED INTESTINAL TUBERCULOSIS

A THESIS
for the Degree of Ch.M. (Edin.Univ.)

by

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LOCALISED INTESTINAL TUBERCULOSIS

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LOCALISED INTESTINAL TUBERCLE

1. INTRODUCTION

The fortuitous observation of a series of examples of a rather rare lesion, which is of surgical interest from the diagnostic and operative standpoint, has lead me to utilise this material for a thesis, and this choice appears to be further justified by the fact that, with the exception of Caird's articles and the occasional publication of isolated cases, or of short articles on special forms of the disease, little has been written on the subject in the medical literature of our Country, although an excellent but brief résumé of our knowledge of the disease is to be found in Mummery's "Diseases of the Rectum and Colon".

My series comprises fourteen cases, on eleven of which I operated or assisted at operation, and I am greatly indebted to Sir Berkeley Moynihan for permission to publish the notes of a case which was under his care, and to my senior colleagues Colonel Connell, Mr. Archibald Cuff, and Dr. Ernest Finch for having allowed me to use the notes of their cases, on which I operated on their behalf, or assisted at operation.

I would also express my great gratitude to Professor Douglas, and to Dr. Simson of Sheffield University for their assistance in the pathological examination of the specimens, and to my friend Professor Stewart of Leeds University for his invaluable help in the preparation of the paper.
The credit of having first fully and accurately described the hyperplastic form of ileo-caecal tuberculosis is usually assigned to Hartman and Pilliet (1) who in July 1891 read a paper on "Typhlit tuberculose simulant les cancers de la region" before the Anatomical Society of Paris.

The following foot-note appears in the transactions of the Society - 'the existence of tuberculous typhilitis as an isolated lesion, and as such distinct from the intestinal lesions commonly found in phthisical patients has already been noted by MM. Blatin, Barre, Paulier, Damaschino, Duguet etc'.

Delbet in the discussion which followed the reading of Hartman and Pilliet's paper drew attention to the fact that Billroth had previously shown at a meeting of the Medical Society of Vienna, a resected caecum affected by this hyperplastic form of the disease, and had emphasised its resemblance to carcinoma. Billroth (2) had, in fact, resected six tuberculous caecums, with one death between July 1889 and February 1891. In one of his cases colloid carcinoma was associated with the tubercle. This series of cases was not, however, published till 1892.

On clinical grounds the existence of the disease had been suspected at a much earlier period, and Leudet in 1859 appears to have been so impressed by its frequency, that he went so far as to suggest that all forms of appendicitis might be tuberculous in nature: while Lasègue wrote at a slightly later date.
'toute pérityphilité à rechutes qui évolue à froid, doit éveiller l'idée de la tuberculose'.

While these observations are of interest, more accurate knowledge of the lesion would appear to have arisen from, and to be contemporary with the progress in abdominal surgery, which marked the closing decades of last century.

According to Benoit (3) (1893) Bouilly in December 1887 was the first French Surgeon to successfully resect the ileo-caecum: the tumour was reported by Pilliet to be a lymphadenoma or lymphosarcoma, but at a later period, after study of similar cases, he re-examined the specimen, and altered his diagnosis to that of tuberculous hyperplasia.

Earlier resections had, however, been performed by Czerny in June 1886; Bassini in April 1887; and Suchier in November 1887.

In Czerny's case the tuberculous caecal tumour was mistaken for a movable kidney, and the resection was done after nephropexy had failed to relieve the patient.

Bassini's case was shown by Levi at a Medical Congress at Padua in September 1889 as a lymphosarcoma of the caecum. There was no recurrence after operation.

While Suchier's ileo-caecal tumour proved to be tuberculous on pathological examination.

Hartman and Pilliet's original communication was based on two cases. The first - an Egyptian woman, aged 25, was operated on by Terrier in May 1891: a tumour was found to occupy the ileo-caecal region and its tuberculous nature was demonstrated in the appendix which was removed. Their second specimen was found at autopsy on an aged woman, who died of intercurrent disease
in the hospice d'Ivry.

Pilliet's accurate descriptions of the histological changes in these and in later examples of the disease have been confirmed by all who have subsequently studied the condition, while the observations of his associate, Hartmann, on the clinical and surgical aspects of his growing series of cases drew the attention of surgeons in other countries to the existence of a disease, with the hyperplastic form of which his name is associated, rather to the exclusion of his original co-worker, Pilliet.

In the years which followed the publication of Hartmann and Pilliet's papers, many cases were recognised and recorded by other French and German Surgeons.

Sachs(6)1892 published the notes of a case of the hyperplastic form of the disease on which he had operated, and to this he added the particulars of 12 other cases collected from the literature.

Benoit's monograph was based on thirty cases, and included those of Péan, Richelot and Broca: while Coquet(7)1894 and Itié(8)1898 devoted their theses to the same subject.

In 1893 Conrath(9) published his important commentary on 85 personally observed and collected cases, and his work is recognised as a complete and well-balanced investigation of the material available up to that time.

Of more recent German work, we owe to Rubesch(10)1909 an excellent review of the operative technique and results, while Hülse(11)1914 reported two cases, and contributed a careful study of the morbid anatomy and histology of the hyperplastic form of the disease.
In our language the literature on the subject is by no means copious: Caird's articles\(^{12,13}\) on the clinical aspects and operative treatment of Intestinal Tuberculosis, are outstanding and noteworthy contributions to our knowledge. The later article being based on a series of 43 cases treated in the Royal Infirmary, Edinburgh, between 1895 and 1919.

Mayo Robson\(^{14}\) (1902) read a paper on Chronic Intestinal Tuberculosis before the London Clinical Society, in which he gave the clinical histories of seven personal cases, two of which were examples of hyperplastic caecal tubercle, while in a third the tuberculous lesion was limited to the appendix. In speaking of the latter, Robson said that he had met with a similar condition on five different occasions.

Hogarth Pringle\(^{15}\) (1907) published a detailed account of five cases of ileo-caecal tubercle: one of which was an example of diffuse hyperplasia of the lower ileum.

In the same year Frank Kidd\(^{16}\) contributed an article on Hyperplastic Tuberculous Pericolitis, from his observation of three cases of subserous hyperplasia affecting the sigmoid flexure, which he apparently judged to be tuberculous, from the similarity of the histological appearances to those of the hyperplastic form of ileo-caecal tubercle.

Isolated examples of various forms of the disease have also been recorded by the following:

Hudson \(^{17}\) 1888 described a specimen found at autopsy in a boy of 12, in which tuberculous ulcers of the caecum and ileum were associated with the presence of fruit stones.

Rolleston\(^{18}\) 1890 demonstrated a specimen which showed six tuberculous strictures of the large intestine.
Sainsbury(19)1892 published the notes of a case in which extensive tuberculous ulceration with thickening of the walls of the caecum and large intestine were found at post mortem examination, while the disease in the lungs was early and appeared to be secondary to the bowel lesion.

Gilford(20)1893 gave particulars of a case, in which a caecal tumour which had been diagnosed as a renal neoplasm was resected through a lumber incision. The specimen was considered to be a sarcoma, but as Kidd points out, the description and history indicate that this was an example of tuberculous hyperplasia.

In July 1897 Cotterill(21) showed a case at the Edinburgh Medico-Chirurgical Society, in which he had successfully resected the ileo-caecal loop in a boy of 6, for the hyperplastic form of the disease.

In the same year Page(22) records a case of tuberculous ulceration of the caecum, which simulated simple appendicitis: and Lediard(23) excised a tuberculous caecal tumour, but failed to restore continuity of the gut.

Hatch(24)1899 appears to have mistaken a tuberculous hyperplasia of the caecum for a renal neoplasm.

Grey Turner(25)1905 published an instructive commentary on a case in which the clinical signs led to a diagnosis of appendicular abscess, but which proved at operation to be an acute typhlitis: a tuberculous diverticulum of the ascending colon, having served as an atrium for an acute secondary infection of the walls of the gut.

In the same year Hall and Graham Simpson(26) fully described an interesting case, in which apparently primary and old-standing ulcerated hyperplastic tuberculous lesions in the caecum gave rise to a secondary
general lymphatic infection, which clinically simulated Hodgkin's disease in its earlier stages.

Mummery(27)1910 showed a specimen which consisted of seven inches of the pelvic colon, which he had resected for a tubular stricture, and which he considered to be an example of the diffuse form of tuberculous disease. The actual pathological nature of the specimen gave rise to some discussion, and Rowland's suggested that it was the result of diverticulitis.

A typical case of a contracting tuberculous ulceration associated with hyperplasia of the ileo-caecal region, is fully recorded and illustrated in Guy's Hospital Reports (1911) by French, Rowlands and Poulton.

Before 1900 there are few references to the disease in American literature: Beck(28) and Ochsner(29) merely mention examples of the condition which they had observed, in considering the operative technique of removal of tumours of this region: in that year Crowder(30) published an interesting paper on the subject, which was based on two personal cases. The first - in a coloured schoolgirl of 14, was of the hyperplastic variety; while the second specimen obtained at autopsy, showed carcinoma grafted on tubercle of the caecum.

A year later Lartigau(31) made a very complete study of the disease, as a result of his detailed investigation of a unique case, in which the whole of the lower two-thirds of the ileum and large intestine as far as the sigmoid flexure was affected by a diffuse hyperplasia of tuberculous origin.

Both Crowder's and Lartigau's papers are important contributions to the literature of the disease, and contain detailed studies of the morbid anatomy and bibliography of the subject.
Statte(n°1909 recorded two cases in which tubercle and carcinoma were associated in the same portion of the intestine, and collected twelve other cases from the literature. In 9 of the 14 the ileo-caecal region of the gut was affected, while in 4 the diseases co-existed in the rectum.

A study of the more recent publications in the American Journals is somewhat disappointing, and the work may be briefly summarised as follows:

Ranschoff(33)1920 described a case of hyperplastic tubercle in a boy of 9, in which seven inches of the lower jejunum was involved. The mass was resected and the patient cured. The tuberculous nature of the lesion was not definitely proved, and this author makes the surprising suggestion that the small round celled infiltration may be due to a sarcomatous condition grafted on to a tuberculous process.

Opie(34) states that he found tuberculous mesenteric glands in 18 of 66 post mortem examinations, which he had performed at Rouen on British soldiers, all of whom were between 20 and 30 years, and he draws the following conclusion - 'the foregoing study of tuberculosis in adults, who with one exception had died with conditions wholly unrelated to tuberculosis, has shown that evidence of fresh infection with tubercle may be found in the mesenteric lymph nodes of one of every four young British adults, whereas similar lesions are relatively uncommon in America. The greater frequency of tuberculosis among cattle in Great Britain suggests itself as an explanation. Ringer and Minor(35) state that the diarrhoea in tuberculous patients with intestinal lesions can be checked by repeated intravenous injections of 5-10 ccs of a 5 per cent solution of calcium chloride.
Pitts reports two cases in children (aged 11 and 2 respectively) in which an isolated primary focus in the lower jejunum gave rise to generalised tuberculous infection.

Coffey states that in his experience, beneficial results and cure of ileo-caecal tubercle have followed ileo-stomy; and in complete disagreement with the experience and recommendations of all European surgeons, he advises this retrograde procedure in treatment of the disease.

Jelks reports that remarkable improvement took place in tuberculous patients suffering from tuberculous enteritis, who were treated by injections of oxygen into the peritoneal cavity.
Section III

Reports of Fourteen Personally Observed Cases, which are grouped as follows:-

(i) Six cases which proved to be tuberculous on histological examination. Nos. I - VI

(ii) Three cases which gave positive guinea pig inoculations, although histological proof of the tuberculous nature of the lesion was lacking.

Nos. VII - IX

(iii) Three cases which were diagnosed as tuberculous from the conditions found at operation, but in which there is neither histological nor bacteriological proof.

Nos. X - XII

(iv) Two cases of Diffuse Hyperplasia of the intestine.

Nos XIII. XIV
CASE I

Mixed ulcerative and hyperplastic type in a tuberculous youth, with obstruction. Lateral anastomosis failed to arrest the progress of the lesion, and resection three months later was followed by death from pneumonia in the fourth week.

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F.B. Male aged 14 (Dr. Want, Retford)
Admitted to the Royal Infirmary, Sheffield, with the diagnosis of tuberculous peritonitis, 7/4/19.
The general condition on admission was fairly good.
For some months he had been troubled with attacks of colicky pain in the stomach, which had been growing gradually worse and of late had been accompanied by vomiting. He had lost flesh.
There were definite signs of tubercle in both apices, and tubercle bacilli were found in the sputum.
A fairly large irregular tumour, of ill-defined outline could be felt in the right lower abdomen.
The bowels acted with enemata, and for a few days his condition improved, but vomiting and abdominal distension then recurred, and it was thought that the tuberculous peritonitis was giving rise to obstruction.
Laparotomy was performed on April 14th through a right paramedian incision. The lower portion of the small intestine was very much distended, and its walls were thickened and hypertrophied.
A tumour occupied the caecum, and appeared to surround the commencement of the ascending colon. On the mesial side it fused with a mass of glands in the ileo-cecal angle; the mesenteric glands were enlarged and some
of them were calcified.
The abdominal localisation of the disease was apparently restricted to the ileo-caecal region and its lymph glands. A lateral antiperistaltic anastomosis was established between the lower portion of the ileum and the transverse colon. The small bowel was divided beyond the anastomosis and its cut ends invaginated.
He left hospital on May 3rd.
In August 1919 his Doctor wrote to ask if he could be re-admitted as he was getting worse, and he was taken in again on August 10th.
He had lost weight, looked pinched and ill, and had been troubled with diarrhoea since the previous operation.
The evening temperature was 101.5 and the abdominal tumour had increased in size and was tender.
On August 12th, the abdomen was again opened through the scar of the previous operation. The tumour had increased in size and vascularity; the glands were swollen, and the serous surface of the affected gut was studded with tubercle.
The whole mass was now fixed down in the angle between the posterior and lateral abdominal walls. The closed end of the distal segment of the ileum had become adherent to the site of the anastomosis.
The terminal portion of the ileum, caecum, ascending colon, and hepatic flexure, were mobilised with some difficulty because of the adhesions, and excised after division and invagination of the transverse colon proximal to the anastomotic opening.
A drainage tube was put down to the closed end of the colon. Leakage took place from the colon stump, and localised peritonitis, and a faecal fistula supervened and lead to infection and breaking down of the wound. In the third and fourth weeks the local condition improved, though a slight
faecal discharge continued from the tube sinus. He
developed pneumonia at both bases, and died on September
6th 1919.
The specimen is illustrated (Fig 1).
The lesion is obviously tuberculous, and the calcified
epipyloric and mesenteric glands are well shown. The mucosa
was ulcerated on both sides of the stricture, and the
ulcers on the distal side were tuberculous in character.
Histological Examination showed tubercles and round celled
infiltration, while fibrotic changes predominated in other
portions examined.
CASE II

Resection of caecum and ascending colon for acute typhlitis secondary to tuberculous ulceration of the mucosa.

Miss M.M.20 - Barmaid (Dr. Fenton, Bakewell)
Admitted to the Royal Infirmary, Sheffield, 13/12/22. under the care of Colonel Connell, with the diagnosis of acute appendicitis.

History: Previous health good. The present illness commenced suddenly two days ago, with pain in the right lower abdomen and vomiting. The bowels had acted on the second day after aperients.

Temperature on admission 102.6; pulse 108.

The patient was well-developed, but looked ill, and a tender fairly well defined elongated mass was felt in the right iliac fossa and right lumbar region, which was thought to be an appendicular abscess.

The operation was commenced at 2.0 a.m., by the Resident Surgical Officer, who sent for me on finding that he had to do with a tumour of the bowel.

The walls of the caecum, and ascending colon, were greatly and uniformly thickened and stiff with inflammatory oedema. The retroperitoneal tissues were oedematous, and the mesenteric glands were enlarged and acutely congested.

The lower portion of the ileum, ascending colon, and hepatic flexure were mobilised and resected, and an iso-peristaltic lateral anastomosis was established between the ileum and transverse colon.

A drainage tube was inserted into the kidney pouch through a separate stab wound in the right loin.

Progress was uneventful, the drainage tube was removed on the third day, and she went home in the fourth week.
Three months later she reported at Outpatients before going back to work. The wound was soundly healed and her health was good. There were no signs of tubercle in the lungs.

This patient could not be traced in May 1924.

The specimen showed great thickening of the walls of the caecum and ascending colon, which, in the fresh state, measured over an inch in diameter, and were juicy, and of a gelatinous appearance. The exudate appeared to chiefly lie in the submucous and subserous coats.

Several irregular circular ulcers were seen on the mucosa (Fig.2) the first of which lay just on the ileal side of the valve.

The ulcers were shallow, the edges thickened, but not undermined, and their bases were roughly granular in appearance. The lumen of the gut was not appreciably reduced in size.

The glands were congested, oedematous, and fleshy looking on section.

Characteristic histological tubercles were found in sections cut from the bases and edges of the ulcers, while the changes in the outer layers of the gut and glands appeared to be simply of an inflammatory nature.
CASE III

Ulceration, hyperplasia, and stenosis of the ileocaecal valve. Resection.

Miss E.W. aged 21 (Dr. Dibbs, Bramley).
Occupation - Booking clerk in Picture House.
Admitted to the Royal Infirmary, Sheffield, under the care of Mr. Ernest Finch, July 14th 1924, with the diagnosis of acute appendicitis.

History - The present illness commenced on the morning of the 13th, with severe griping pains round the umbilicus, which "doubled her up". She vomited two or three times. The bowels acted on the morning of the 14th after aperients, the pain was not relieved, but it appeared to alter in position and settled in the right lower abdomen.

Previous health - Two slighter but similar attacks, 15 and 12 months ago. Her health was otherwise good, and she had not seen a Doctor since she was 13. She now weighs 9 st. 1 lb. and she thinks she is gaining weight. Bowels act regularly, and she has not noticed any blood or mucus in the motions.

Family history - Her mother's sister died of consumption.
Condition on admission - A fairly well-developed girl; she looks ill and complains of pain in the right iliac fossa, where on examination muscular rigidity, and an ill defined tender swelling could be felt. The right thigh was held in a position of slight flexion, and she complained of pain when it was extended.

No signs of tubercle were present in the lungs.
Operation 14/7/24 commenced by the Resident Surgical Officer, who sent for me on finding that the lesion appeared to be ileo-caecal tubercle and not appendicitis.
The abdomen had been opened by a paramedian incision. The lower portion of the small intestine was distended down to the ileo-caecal valve, around which there was a localised thickening of the gut wall. The peritoneum was roughened and puckered over the affected portion. The glands of the ileo-caecal angle and mesentery were enlarged. The lower 12 inches of the ileum, caecum, ascending colon, hepatic flexure and proximal third of the transverse colon were mobilised and resected with the enlarged regional glands, and an iso-peristaltic lateral anastomosis was formed between the proximal ileum and transverse colon. A drain was left for 48 hours in the right kidney pouch. The after course was straightforward and she left hospital with the wound soundly healed at the end of the third week.

This patient was re-examined on December 17th 24, and found to be in good health. Her weight was just under 10 stones and the bowels were slightly constipated. No signs of tuberculosis could be found on examination of the lungs.

The specimen (Fig.3), part of which has been cut away - shows stenosis from ulceration at the ileo-caecal valve, around which the gut walls exhibit a moderate degree of hyperplasia. Several shallow ulcers are present in the lower nine inches of the ileum.

As the ulcers in the ileum proximal to the valve were not manifest on external examination, this specimen emphasises the advisability of resecting a fair length of the lower ileum in these cases.
PATHOLOGICAL EXAMINATION - Professor Stewart, Leeds.

1. **ILEUM** (10" have been removed)

The last two inches or so of ileum show progressive thickening down to the ileo-colic valve, where the bowel wall is fully half an inch across. The mucosal surface is irregular and ulcerated. The thickening stops abruptly below. Above, moderate thickening continues for another six inches, but much less than in the lowest two inches. One large and several tiny reddish areas (? of superficial ulceration) are seen.

**A. Histology of lowest 2"**.

The lesion is a granulomatous one involving the whole thickness of the bowel wall, which is greatly disorganised. The mucosa shows patches of ulceration with intervening fairly healthy areas in which the epithelium and glands are more or less intact. The granulomatous deposits are mainly in the submucosa and inner muscular coat, both of which are very much broken up. A number of narrow sinuses extend from the ulcers on the surface into the depths of the granulomatous masses, often branching as they descend and containing pus in their interior. The outer muscular coat is least affected, but even its continuity is broken in places, although in the sections examined none of the sinuses seem to have gone through. External to the muscular coat there is again great inflammatory thickening, with granulomatous nodules and much lymphoid reaction. The granulomatous masses consist for the most part of apparently simple granulation tissue, and this is especially true of the walls of the sinuses. The
cells chiefly present are endothelial cells, lymphocytes, plasma cells and fibroblasts, with a sprinkling of eosinophils, while round about the more cellular masses there is much fibroblastic overgrowth. In addition, occasional typical tubercle follicles are seen, with and without typical Langhan's giant cells. Polymorphonuclears are by no means conspicuous, except within the sinuses and in other foci of liquefaction which may be portions of sinuses cut transversely. In the subserous coat masses of lymphoid tissue are conspicuous. Careful examination of sections stained by Ziehl-Neelsen's method fails to reveal the presence of tubercle bacilli.

B. Histology of portion of ileum about 6" above ileo-colic valve.

The wall is slightly thickened, mainly as a result of oedema of the submucosa.

A portion of wall 1½" long was cut. It consists in part of the area of a large Peyer's patch, in part of intestinal wall without lymphoid tissue. The latter part appears practically normal except for obvious distension of lymph channels in the submucosa (the result of lymphatic obstruction) and congestion of vessels in the same region, together with much local eosinophilia of the mucosa. The area where lymphoid tissue is present shows quite distinct changes. The mucosa shows intense congestion of small blood vessels, and a certain amount of denudation of surface epithelium. At one place there is a distinct little ulcer, where the mucosa is totally lacking down to the lymphoid tissue, the latter being clothed by a thin layer of fibrino-purulent exudate. There is, however, no histological evidence of tubercle. The submucosa again shows distension of lymph channels. The stroma of the mucosa here is very rich in plasma cells with eosinophils and lymphocytes in rather smaller numbers.
2. ILEO-COLIC ANGLE MESENTERIC LYMPH GLANDS.

Three glands, each about \( \frac{1}{2} \)" in diameter, were examined. One of them showed a series of 4 or 5 typical tubercle follicles scattered round the periphery, small in size and obviously early lesions, but each containing one or more typical giant cells. Neither of the other glands shows any evidence of invasion, but in one there is great distension of lymph channels by albuminous fluid, while the (? afferent) lymphatics in the surrounding fat are similarly affected. No tubercle bacilli are seen in Ziehl-Neelsen's sections.

3. COLON.

The caecum away from the ileo-colic valve shows no naked eye evidence of change.

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CASE IV

Multiple tuberculous ulcers of caecum and ascending colon.

Married - no children.
Admitted to the Royal Infirmary, Sheffield, 12/5/1924 under the care of Mr. Archibald Cuff.

History: Was quite well up to two years ago.
He then commenced to be troubled with attacks of "indigestion". The attacks lasted for about a week and for a time came on every month or two, but have gradually become worse, till for the last six or eight weeks he has never been free from pain. The pain sometimes comes on immediately, at other times one or two hours after food.
He always feels sick after a meal, but has only vomited on one occasion. The pain rarely prevents him from sleeping, as it seems to be eased when he lies down.
The bowels are regular and act once or twice a day. The motions are formed, and he is never troubled with diarrhoea.
He passed blood on one occasion three weeks ago. He has lost weight - he thinks two stones in the last two years.
Previous health - Dysentery in 1915 while serving in Egypt; was three months in hospital and rest camp; no trouble with bowels after that, he felt quite fit, motions formed, no rectal spasms; no blood or mucus in stools. He put on weight while convalescent, and was 12 stones on returning to duty.

Family history - Two brothers died of phthisis; one at 29, the other at 61 years.

Present condition: Well built and intelligent. Looks thin and ill. Weight 9 st. 7 lbs.
He complained of discomfort when deep pressure was made...
Fig. 4.
over the right side of the epigastric and appendicular regions. No tumour was felt. Barium meal X-Ray examination showed no abnormality of stomach or duodenum. There were no definite signs of tuberculosis in the lungs. 15/5/1924. Laporotomy (Mr. Cuff)
The stomach and duodenum appeared to be normal. The walls of the caecum, ascending colon, and hepatic flexure were thickened and congested, and the lymphatic glands in the mesentery greatly enlarged. The condition appeared to be an ulcerative tuberculous lesion affecting those segments of the gut.
The lower ileum, caecum, ascending colon, and hepatic flexure were mobilised and resected. A lateral anastomosis between the ileum and transverse colon being made.
The abdomen was closed without drainage. The patient developed peritonitis and died on the third day after operation.
An autopsy was refused.
The specimen (Fig. 4) shows multiple, irregular ulcerated areas in the portions of large intestine which had been resected.
The glands showed a fleshy enlargement without any naked eye appearance of tubercle.
Histological examination of the floor of the ulcers showed characteristic tubercles.
CASE V. Mr. Ernest Finch.

Mixed ulcerative and hyperplastic ileo-caecal tubercle. Obstruction. Two stage anastomosis and resection.

Miss A.M.L. aged 20, Schoolteacher (Dr. Jardine, Wombwell, Barnsley).
Admitted to the Royal Infirmary, Sheffield, under the care of Mr. Ernest Finch, with the diagnosis of Intestinal Obstruction 16/10/18.

History: In good health till three weeks before admission, she then began to be troubled with severe attacks of abdominal pain, which came on suddenly and doubled her up. For the last four days she has vomited repeatedly. The bowels have not acted for ten days, with the exception of a slight result after an enema. Her previous health has been very good and she has gained half a stone in weight in the six months preceding her present illness.

Her father's brother died of phthisis. She is one of a family of 10. Two died in infancy - one from meningitis. One was killed in the war. The others are healthy.

On admission she looked ill, the abdomen was distended. She complained of pain over the appendicular region, and kept the right thigh flexed; enemata were given without result, and she vomited.

Operation 15/10/18.

The abdomen was opened through the right rectus sheath. The small intestine was found greatly distended down to the ileo-caecal valve which was stenosed by a localised thickening of the wall of the gut, which surrounded the termination of the small bowel, and extended into the caecum. The mesenteric glands were enlarged and hard. The lesion appeared to be a hyperplasia around a cicatrised tuberculous ulcer. The poor general condition,
Fig. 3
Appendix running into thickened caecal wall
and the distension of the bowel appeared to contra-
indicate a one stage resection, so I made a lateral
anastomosis between the distended ileum and the
transverse colon.

After progress was satisfactory, the bowels acted freely
and the general condition improved rapidly.

29/11/18. Mr. Finch resected the terminal portion
of the ileum, caecum, ascending and transverse colon
proximal to the anastomosis opening.

A faecal fistula formed and delayed healing of the
wound for some weeks but ultimately healed, and she
left hospital in March 1919.

Tubercles were found in the walls of the gut around
the ulcerated area. The hyperplasia of the gut wall
was well marked and is shown in the photograph of the
specimen (Fig. 5).

Re-examined August 15th 1924. In excellent health,
working regularly as a teacher, weight 8 st. 7 lbs.
Has no trouble with the bowels. There are no signs
of tubercle in the lungs.
CASE VI

Localised Tuberculous Ulceration with Stricture of the Ileum associated with Diffuse Ulceration of the Large Bowel.

Miss I.E. aged 21: (Dr. Hurst, Chesterfield)

Complaint - Diarrhoea.

History - Since the age of 14 she has been troubled by recurring attacks of abdominal pain and distension, and vomiting. Three years ago she was confined to bed for six months, and for the first three days of that illness the pain was very severe and continuous, and she vomited incessantly. On the third day the vomit was a dark brown fluid which smelt offensively, and she had very painful cramps in the feet and legs and was unable to open her hands. She then improved gradually, but the griping pains and vomiting kept recurring, and ever since that severe illness she has been troubled with diarrhoea. The bowels act from five to eight times daily, and the motions are always loose and offensive. The condition had been diagnosed as ulcerative colitis, and temporary improvement resulted from medical treatment, and irrigations of the colon.

Examination: Of fairly healthy appearance and physique. No signs of tuberculosis were present in the lungs. The abdomen was rather full, and some tenderness was complained of on deep palpation along the course of the large bowel.

Nov. 13.24. The abdomen was opened through a right paramedian incision. The small intestine was greatly hypertrophied down to a point about 4 ft. above the ileo-caecal valve, where for an inch of its length the gut was stricture by a puckered contraction of its walls. The thick walled flaccid coils of the intestine above the stricture...
measured about two and a half inches in diameter, while the ileum below was thin walled and contracted. The whole of the large intestine from the ileo-caecal valve down to the ileo-pelvic colon showed numerous areas of irregular thickening and congestion, its walls as a whole were thinned rather than hypertrophied, and its lumen contracted. The omentum was adherent to the ascending colon, and the fixed segments of the gut were firmly adherent to the posterior abdominal wall.

The condition appeared to be one of tuberculous ulceration, and the disease too widespread to be dealt with at one operation, so the strictured area of the small intestine was excised for pathological examination, and a lateral anastomosis was established between the hypertrophied small intestine above the stricture and the lower portion of the ileo-pelvic colon which appeared to be healthy. The immediate progress after operation was satisfactory, and the wound healed by first intention.

The advisability of further operation was explained to the parents, but they were unwilling to give their consent to a procedure of such gravity, till the result of the short circuit should be apparent, and the patient went home in the third week.

Meanwhile, the diarrhoea continues, and the stools are said to be less offensive in character, but the patient herself has "lost heart" and has taken to bed.

Pathological Report - Professor Stewart, Leeds.
The specimen of small intestine, is a most beautiful example of tuberculosis, of the active ulcerative non hyperplastic type.

The portion cut, shows two ulcers, separated by a small bridge of persistent healthy bowel wall. These ulcers show replacement of a small area of mucosa by granulation
tissue which is not histologically tuberculous. (1) One ulcer extends right into the muscular coat, which is almost but not quite breached, and nowhere shows tubercle follicles. However, in a small lymph node in the subserous coat just below the floor of the ulcer there is a tiny tubercle follicle.

(2) The second ulcer shows only a narrow layer of granulation tissue in its floor, which practically replaces only the mucosa. Below this there is a fine group of aggregated tubercle follicles with typical giant cells, extending through both submucosa and both layers of the muscular coat. The microscopic drawing (Fig. 6) shows the whole thickness of the wall of the intestine at the edge of this second ulcer.
CASE VII

mixed ulcerative and hyperplastic form, with stricture of the ileo-caecal valve.

M.M. Female aged 31. (Dr. Kemp, Thurcroft)

2 children - the youngest 4½.

Her father's eldest brother died of "galloping consumption" (there were 16 in the family, and the others were healthy).

Admitted to the Royal Infirmary, Sheffield, on September 3rd 1921, complaining of "windy pains round her heart" and of a lump in the stomach.

History - ailing from childhood, for the last five or six years she has been subject to attacks of pain in the stomach. The pains usually commence directly after food, and for the last few months they have been getting more frequent and severe. She ascribes this aggravation to injury, as in April last she fell from the scullery table on to her right side.

She seldom vomits but always feels sick during the attacks. Six weeks before admission she noticed on two or three occasions that the motions were black and contained blood, and since then the spasms of pain have been accompanied by the formation of a hard lump in the right side of the abdomen.

She has been in the habit of easing the pain by pressing her stomach on to the back of the couch.

She has always been constipated and this has gradually got worse.

Condition on admission; She was pale and frail looking.

Weight 6½ stones. A hard, tender, slightly movable tumour of indefinite outline could be felt in the right iliac fossa. The palpation excited marked rigid "ladder pattern" spasm of the small intestine.
The bowels acted freely with enemata.
The diagnosis of ileo-caecal tubercle was suggested.
5/9/21. The abdominal cavity was opened through the right rectus sheath. The ileum was found greatly thickened and distended down to the ileo-caecal valve, where the gut was constricted by a hard mass which occupied its whole circumference for a distance of an inch and a half on either side of the valve.
The tumour was fixed to the posterior abdominal wall and fused with a mass of enlarged glands on its mesial side. The mesentery contained a mass of enlarged glands, and a chain of glands similarly affected could be felt up to the pancreas.
The ileo-caecal loop was mobilised and resected after an antiperistaltic anastomosis had been established between the ileum and transverse colon.
A rubber drainage tube was placed down to the colic stump.
The after progress was uneventful; no leakage or infection took place. The drainage tube was removed after 48 hours, and she went home in the third week.
24/5/1924. Re-examined. She now weighs 7½ stones. The general health has improved steadily, but she gets indigestion occasionally, and is still troubled with constipation.
The pathological nature of the disease was not obvious.
The mucosa was nodular and ulcerated on either side of the constricted ileo-caecal valve (Fig.7). Neither the thickened gut wall nor the glands showed any definite evidence of tubercle.
The histological examination showed round celled infiltration of all the coats of the affected portion of the gut. The glands were fibrosed.
A guinea pig inoculated with portions of the glands and of the diseased tissues rapidly developed disseminated tubercle.

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CASE VIII

Hyperplastic form of ileo-caecal tubercle, which was mistaken for an enlarged and movable right kidney. Death 14 days after a two stage resection.

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Mrs. M. aged 26 - married - one child aged 6.

The patient came to Surgical Out-patients at the Royal Infirmary, Sheffield, on May 29th 1922, complaining of a lump in the right loin.

History: For two years she has been troubled with pains in the stomach and right lumbar region. The pains come on in attacks, which are getting worse, but are usually relieved when she lies down. The pains have no relation to food. She has no difficulty with the bowels, except for occasional attacks of diarrhoea. No blood or mucus have been noticed in the motions.

Five months ago she first noticed a lump in her right flank; she does not think it has grown larger since then.

The previous health has been good, and there is no family history of phthisis.

The general condition was good: she was fairly stout and flabby, with some tendency to visceroptosis.

On examination a rounded and freely movable tumour could be felt in the right lumbar region on a level with the umbilicus. The tumour could be grasped bimanually, and seemed to pass back into the loin. There were no abnormal constituents in the urine.

The diagnosis of movable and enlarged right kidney was made.
15/6/1922 - Operation.

An oblique lumbar incision was made, and the tumour was felt in the depth of the wound. After some delay and considerable manipulation, it was found that the kidney lay well up behind the liver, and was normal in every respect, while the tumour was in the walls of the ascending colon.

The lumbar wound was closed, and the patient having been turned round on to her back, the abdominal cavity was opened through a right paramedian incision.

A rounded and hard tumour was felt in the ascending colon, which was shrunken and shortened so that the caecal pouch had disappeared, and the ileum lay in line with the deformed ascending colon.

The whole circumference of the gut was involved, though the bulk of the tumour mass was in its mesial and posterior wall.

The small intestine was moderately distended and hypertrophied.

The mesenteric glands were enlarged but not obviously tuberculous.

The patient’s condition by this time gave rise to some anxiety, and operation was restricted to an anastomosis between the ileum and transverse colon.

On June 29th the abdomen was re-opened, and the whole loop of the gut distal to the anastomosis was mobilised - with considerable difficulty because it had become adherent to the lumbar incision - and resected.

The wound was closed without drainage, and the patient did all right for three or four days; signs of localised peritonitis then developed, and on the seventh day, under gas and oxygen anaesthesia, the anterior incision was opened up, adhesions were separated and a drainage tube
was put down into the infected operation field from which some stinking faecal smelling pus was evacuated. The patient sank gradually from septic absorption, and died on the 14th day.

The specimen cut open showed a tubular stricture from fibrotic changes in the gut wall, with a hard whitish grey mass on the inner and posterior aspect. The mucous membrane was eroded and absent over part of the affected length (Fig.8).

No signs of tubercle could be found on careful examination of numerous sections cut from different portions of the growth and glands.

The gut showed great thickening from round celled hyperplasia in the mucous, submucous, and subserous coats.

The tumour mass was composed of embryonal connective tissue cells and aggregations of small round cells in the softer and outer portions of the affected area.

Macerated fragments of fresh tissue from the tumour and glands were inoculated into a guinea pig. The animal showed no signs of disease, and it was killed as a routine measure on January 3rd 1923.

The glands in the groin near the site of inoculation were then found to be slightly enlarged, and stained smears of the gland substance revealed fairly numerous typical tubercle bacilli.

The patient was not intelligent and a history was obtained with difficulty. After the first operation she was again questioned and then said that in addition to the hard lump, she had for some time noticed that another swelling appeared with the pains, and "it made a rolling noise when it went away".
It is obvious that a more careful history and examination might have revealed the intestinal site of the growth. It is also a matter for regret that the abdomen was closed without drainage, as leakage and infection of the closed cavity caused her death.

CASE IX

Mixed ulcerative and hyperplastic ileo-caecal tubercle, with stenosis of the ileo-caecal valve. Resection.

C.Y. male; 32 years - married - one child 3. 
Occupation - horse-slaughterer. (Dr. Wier, Sheffield). 
Admitted to the Royal Infirmary, Sheffield, 16/4/24, as a case of chronic intestinal obstruction. 
Previous health good. No personal or family history of tubercle. 

History - For three or four months he has been troubled with stomach ache. The pain is worst two or three hours after food, and everything he takes "turns to wind". Lately, these attacks have been getting so severe that they "doubled him up", and he has vomited on two or three occasions. When the pains are "on" a swelling rises up in the lower part of his stomach.
The bowels are constipated, and he has never noticed either blood or mucus in the stools. He is rapidly losing weight. 
Examination - A tall thin, wiry man, of fair muscular development. The lower abdomen bulges in contrast to the sunken epigastrium. No temperature. There was tenderness on deep pressure in the right iliac fossa. No rigid spasm was seen while he was under observation in hospital, but his Doctor stated that he had seen this on several occasions during the attacks of pain.
The abdomen was opened through a right paramedian incision. The ileum was found to be hugely hypertrophied and contained semi-solid faeces. The thickening of the gut terminated at the ileo-caecal valve, which was surrounded by a cuff of indurated tissues of leathery consistence.
The peritoneal covering of this segment was dull and roughened, and the gut dusky in colour.
The glands in the ileo-caecal angle, and the mesenteric glands were enlarged and fleshy.
The lower ileum, ascending colon, hepatic flexure, and one-third of the transverse colon were mobilised and resected with some of the glands, and an isoperistaltic lateral anastomosis was established between the ileum and transverse colon.
A drainage tube was put down into the right kidney pouch.
The after progress was uneventful, and he left hospital on May 3rd.
The specimen (Fig.9) shows great muscular hypertrophy of the walls of the lower ileum.
On cutting open the specimen, the walls of the lower three inches of the ileum, and the adjacent portion of the caecum were greatly thickened, and of leathery consistence. Four or five ulcers of about half an inch in diameter, and with thickened purplish edges, were seen in the lower two or three inches of the mucous coat of the ileum. The ileo-caecal valve was stenosed by a diaphragm-like fibrous fringe, with a small central aperture, of which the edges were ulcerated and thickened. The ascending colon was contracted and thin walled.
The glands were enlarged and fleshy looking on section;
but apart from the tuberculous aspect of the ulcers no definite histological proof of the tuberculous nature of the lesion was found by the pathologist, in the glands or diseased tissues, which showed chronic inflammatory changes, and were infiltrated with small round cells.

17/6/24. A guinea pig inoculated with portions of the fresh glands and tissues showed post mortem, disseminated tubercles in the glands, spleen, etc. and numerous tubercle bacilli were seen in the stained smears of the gland tissue.

15/9/24. Re-examined at Outpatients. Wound soundly healed. General condition satisfactory. No definite signs of tubercle in the lungs. Has no trouble with bowels, which act naturally once or twice a day. Appears to have put on flesh, and is back at his old work.

CASE X

Stenosis of ileo-caecal valve and hyperplasia of moderate degree around a tuberculous ulcer. lateral anastomosis.


History: When he was 12 or 13 years of age he began to suffer from attacks of "belly-ache" which were relieved by domestic remedies. Up to the age of 20 these attacks would come on about every six months; after 20 they became more frequent and severe, came on every three or four months and were accompanied by nausea and sometimes by vomiting. He was all right in the intervals. During the last six months the attacks have recurred weekly, and he has been rather troubled by diarrhoea. He has
never passed blood from the bowel. These pains have been relieved but not cured by medicine, and for two or three months he has noticed that he gets a dull ache in the right lower abdomen between the attacks of colicky pain.

Of poor physique - weight 7st. 12 lbs.

On examination tenderness and increased resistance were felt in the neighbourhood of the appendix, and the diagnosis of chronic appendicitis with adhesions was made.

On February 24th the abdomen was opened through the rectus sheath. The ileum was found distended, and its terminal portion which was greatly hypertrophied, looked and felt as if it were intussuscepted into the caecum, but on closer inspection it was apparent that the thickening of the tissues lay in the wall of the caecum around the ileo-caecal valve, and was there producing stenosis of the lumen of the gut. The mesenteric glands were enlarged and hard, and some of them were calcified. The abdominal viscera appeared otherwise to be free from disease.

An antiperistaltic lateral anastomosis was established between the distended ileum and the transverse colon, and the abdominal wound was closed without drainage. Ten days later I proposed to resect the affected segment of gut, but the patient said he felt relieved and would not consent to further operation, and went home in the third week.

After history: Seen in April 1924, he looks stronger and has put on nearly a stone in weight. His youngest child died three years ago from "enteritis". For some months after operation he was troubled with diarrhoea, and had some return of the dull pain, which he had before operation.

He returned to his work six months after operation, and has worked regularly at it ever since.
Examination—I could find no evidence of tubercle in the lungs. The operation scar is soundly healed. The resistance (probably the enlarged glands) can still be felt, and he complained of slight discomfort on deep pressure over the right iliac fossa.

This case appeared to be an example of old standing tuberculous ulceration of the ileo-caecal valve, giving rise to stenosis from cicatrisation and accompanied by a localised hyperplasia of moderate degree in the caecal wall around it.

CASE XI

Tuberculous Ulcer of Caecum; Resection.
Recurrences in lower ileum; Short Circuit;
Death from generalised tuberculous peritonitis.

Mrs. L.G. 24.

In November 1917 the appendix was removed by Doctor Sinclair White.

About a year later she was seen by Mr. Finch, and then complained of pain in the neighbourhood of the scar, and flatulence.

The attacks of colicky pain gradually got more frequent and severe. The bowels were constipated. She lost weight.

7/11/19. Re-examined. Thin and looks ill. She places the pain to the outer side of the old gridiron appendix operation scar. She is tender on palpation over this area, but no tumour is felt.

Operation 14/11/19. The abdomen was opened through a right pararectal (Battle's) incision. The caecum was fixed down to the peritoneum in the iliac fossa, and its walls were congested and greatly thickened around an ulcer, which occupied the site of the invaginated appendix.
The lower few inches of the ileum, caecum, ascending and half of the transverse colon were resected, with lateral anastomosis between the ileum and transverse colon.

After operation she was troubled with a good deal of wind, and a sinus persisted for some time at the upper part of the incision, but ultimately healed, and for some months her progress appeared to be satisfactory. The attacks of wind and colicky pain then recurred and gradually increased in severity and she lost weight. In March 20 she was thought to be suffering from intestinal obstruction by bands.


Multiple tuberculous ulcers of the ileum proximal to the anastomosis were found. At several points the lumen was stenosed by areas of cicatrisation between which the gut was irregularly pouched and contained faecal concretions.

The peritoneum was studded with diffuse tuberculous nodules, and the mesenteric glands showed advanced tuberculous degenerative changes.

A short circuit lateral anastomosis was established between the gut above and below the proximal and distal strictures.

The immediate after progress was uneventful, but the patient ultimately developed generalised tuberculous peritonitis and died in January 1921.
CASE XII

Acute Typhilitis - probably secondary to tuberculous ulceration of the caecum. Old tubercle in mesenteric glands.

R.F. Boy aged 12. Seen with the late Dr. France, May 10th 1918.

An only child, small in size, pale and poorly developed.

Previous health - good.

No tuberculous family history.

Present illness commenced May 8th with pains in the stomach.

The bowels acted on the following day after castor oil, and then he vomited twice and the pains got worse.

When seen by the Doctor on the evening of the 9th, the temperature was 102, and a tender swelling was felt in the right iliac fossa.

By the night of the 10th, when I saw him, he was very ill - the temperature was 103, and the pulse 120.

A tender and well defined swelling was palpable in the right iliac fossa.

The diagnosis of acute appendicitis with localised peritonitis was made, and laparotomy was performed the same night.

The abdomen was opened by an oblique incision over the swelling, which proved to be a greatly swollen, thick walled, oedematous caecum. The appendix was little affected. The lymph glands in the ilio-caecal angle were much enlarged and congested, while several of the glands in the root of the mesentery were calcified.

The boy's condition gave rise to anxiety, and nothing further was done. A rubber drainage tube was put down to the caecum, and the wound was closed.

The grave symptoms of general infection continued, and he had rigors on two occasions. The evening temperature kept
about 103 to 104, with slight morning remissions. There was no obvious tuberculous lung lesion. There was no discharge from the tube for the first two days, then a purulent discharge commenced (probably due to a secondary infection along the tube) and the wound became infected, and broke down. The bowels acted with enemata. He was delirious for the last two days, and died on the 24th of May.

The appearance and feel of the gut and glands suggested that the lesion was a tuberculous ulceration of the caecum which had served as an atrium for an acute secondary infection with the bowel organisms. The conditions present were exactly similar to those found in Case II which proved on resection to be tuberculous, and a similar case is recorded by Grey Turner.25

I regret that I did not resect the affected gut, which was the obvious seat of the infection.

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**CASE XIII**

**DIFFUSE HYPERPLASIA OF THE LOWER ILEUM**

**RESECTION - Sir Berkeley Moynihan.**

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J.B.L. aged 58.

In January 1923, on getting out of bed one morning, he had a smart attack of abdominal pain, which was sufficiently severe to make him get back into bed for half and hour.

During the succeeding weeks he had several similar attacks of griping colicky pain, which came on about midnight, and kept him awake for several hours. The attacks would come on every night for a few nights, and then miss a few days. He had taken an unusual amount of outdoor exercise during the Xmas holidays, and thought that might have lighted up
some old appendix trouble.

The attacks continued, and he began to get discomfort during the day. On two or three occasions he had severe nausea and salivation, which came on when he was cycling home to lunch, and made him get off his bicycle, he felt so ill and giddy.

He had been in the habit of sleeping on his left side, but found he could do so no longer, as this position brought on the pain.

The bowels were inclined to be constipated, and he had to take aperients to keep them regular.

He has always been spare, and does not think he has lost much weight.

Previous health: 12 years ago, while living abroad, he had severe attacks of right-sided abdominal pain, which he himself thought were due to renal colic, because he got relief after passing a small stone, but the surgeon then looking after him said there was some other trouble besides that, as he could feel thickening around the appendix.

Operation - Sir Berkeley Moynihan 7/6/1926.

The last two feet of small intestine were involved with hyperplastic tubercle. Friedrich's operation was performed, taking two to three feet of small intestine to clear the involved glands, and just on to the transverse colon. Lateral union.

The gall bladder showed an adenomatous condition at its tip and was removed.

PATHOLOGICAL REPORT - Professor Stewart.

Naked-eye examination.

The specimen (Fig.10) (part of which has been cut away) consists of about 18" of ileum, ileo-colic valve, caecum, appendix, and about 2" or 3" of ascending colon.

The pathological lesion affects principally the ileo-colic
valve and lowest 6" of ileum. Above this the changes become gradually less striking for a distance of perhaps 3" and the remaining 8" or 9" of the ileum show very little pathological change.

There is great thickening of the wall of the lower ileum involving chiefly the muscular and mucous and submucous coats. The surface of the mucosa is at the same time finely granular, and coarsely and irregularly nodular. All these changes, well seen in the lowest 6" rapidly become less marked in the 3" above this, after which the normal valvulae conniventes become apparent, and the granularity and nodosity of the mucosa disappear. In the intermediate zone, the mucosa, in addition to being slightly nodular and slightly granular, presents numerous small superficial, rather pitted ulcers. The serous coat is everywhere intensely injected and slightly roughened, while in the lower half it presents tiny tubercle-like nodules. The appendix and colon appear normal. The mesenteric glands of the ileo-colic angle are enlarged and intensely congested and haemorrhagic. They present no gross evidence of caseation.

Histology of lower ileum etc.

The chief pathological changes are as follows:

(1) Intense vascular engorgement of mucosa and serosa.
(2) Notable hypertrophy of the muscular coat and of the muscularis mucosae.
(3) Great distension by albuminous fluid of the lymph channels of the submucosa, particularly in relation to the lymphoid patches, which are large and active, breaking the continuity of the muscularis mucosae.
(4) Inflammatory swelling of the tips of the mucosal villi, with and without superficial epithelial denudation. These swollen bulbous tips are over-run by lymphocytes and plasma cells, with scattered polymorph leucocytes, especially in the surface layer, and diffusely scattered eosinophil cells
in considerable numbers.
Where epithelium is lacking, groups of polymorph leucocytes are often seen lying free on the surface.
(5) Here and there an actual superficial ulcer is present, acute, with a layer of fibrinopurulent exudate replacing part of the mucosa.
They occur chiefly in relation to areas of lymphoid tissue (Fig. 11).
(6) Here and there in the deeper layers of the mucosa, but still superficial to the muscularis mucosae, occasional small round focal inflammatory lesions are seen, the chief features of which are the accumulation of polymorph leucocytes, and the proliferation of endothelial cells (Figs. 12 & 13).
In no case have giant cells been made out, nor cessation. The lesions are obviously fairly acute.
(7) The ileum about 7½" above the ileo-colic valve shows similar lesions to those described above, (4, 5 & 6) but there is much less thickening of the various coats (mucosa, submucosa and muscularis).
(8) The mesenteric lymph glands show broadening of the lymph tracts, which are filled with a mixture of red blood corpuscles, lymphocytes, and large endothelial cells, the latter nearly all containing a variable amount of blood pigment. There are no inflammatory foci and no evidence of tubercle.
In no part of this specimen has one been able to demonstrate a definite tuberculous lesion nor the presence of tubercle bacilli.
CASE XIV (Mr. Archibald Cuff)

Diffuse Hyperplasia of Ileum;
Operation - short circuit.

Ada L. Married, 4 children; youngest 2 years.
(Dr. Woodruffe, Ecclesfield)

Admitted to the Royal Infirmary, Sheffield, 9/10/23
for intestinal obstruction.

Family history: One sister died of tuberculous
abscesses of the thigh.

Previous health: Five years ago was treated at
Buxton for chronic rheumatism of the knees, and this has
troubled her ever since.

Present illness: For four or five months she has been
troubled with attacks of pain in the stomach of increasing
severity. The pains come on during meals, and are
relieved by vomiting. The pain is followed by diarrhoea,
and she passes about six loose motions in the 24 hours.
No blood or mucus has been noticed in the stools. For
some hours before admission the pain had been very severe
and continuous, and she has vomited repeatedly.

Condition on admission - A pale flabby woman with pyorrhoea.
Weight 8 st. 9 lbs. Has advanced osteo-arthritic changes
in both knee joints.
The abdomen is distended and a tender resistant mass can
be felt in the right lower abdomen.
The bowels acted freely with enemata, and her condition
temporarily improved.

On the 11th the distension returned, and peristaltic
waves were seen which appeared to affect the small
intestine.

Operation 11/10/23. Mr. Cuff.
The abdomen was opened through the right rectus sheath.
The small intestine was found distended down to a point
about 15 inches above the ileo-caecal valve, where the
distension terminated in a diffuse and uniform thickening in the walls of the gut, which continued down to and disappeared just proximal to the valve. The gut was larger than normal, with greatly thickened walls, which appeared to encroach on the lumen. The mesentery of the affected segment was thickened, and the lymphatic glands were enlarged and so hard that they were thought to be calcified.

A lateral anastomosis was established between the distended ileum and transverse colon.

Progress after operation was uneventful, and the bowels acted regularly.

The Wassermann reaction was negative.

No history of any previous attack of enteritis could be elicited.

22/11/23. Mr. Cuff re-opened the abdomen through a right paramedian incision with the intention of resecting the hyperplastic portion of gut, but the patient did not take the anaesthetic well, and the extirpation was not carried out. She left hospital three weeks later.

15/5/24. Re-examined. Since the operation the general condition has improved and she has put on weight. The bowels act regularly. She is, however, troubled with occasional griping pains, and then feels "as if her inside was all rolling with wind". She complains of pain on pressure, and an ill-defined resistance can still be felt in her right lower abdomen. She has no signs of tubercle in the lungs.
ARTIOLOGY

While this paper is essentially concerned with localised and apparently primary forms of intestinal tuberculosis, and not with tuberculous ulceration which commonly enough occurs as a mere terminal event in pulmonary phthisis, it is of interest to note the relative frequency and distribution of the latter, and this we find in an analysis published by Fenwick and Dodwell (1892) entitled "Perforation of the Intestine in Phthisis" which gives the results of 2000 post mortem examinations at the Brompton Hospital.

They found ulceration of the intestine in 56.6 per cent. In 500 cases in which ulceration was present, the ileo-caecal region was affected in 85 per cent; while in 9.6 per cent, it proved to be the only portion of the intestine which showed any evidence of disease. From this spot the liability to the tuberculous disease was found to diminish steadily in either direction, and consequently it was found that the duodenum and rectum were never diseased unless the other portions of the tract were already in an advanced state of ulceration. Thus among the cases alluded to ulceration was noted to be present in the duodenum in 3.4 per cent; in the jejunum in 23 per cent, in the ascending colon in 51.4 per cent; in the transverse colon 30.6 per cent; in the descending colon 21 per cent; in the sigmoid flexure 13.5 per cent; and in the rectum in 14.1 per cent.

These figures closely correspond with Eisenhart's (40) who found 563 cases of intestinal tuberculosis in 1000 post mortem examinations of tuberculous adults, and their great interest
to us, lies in the fact that the localised forms of Intestinal Tuberculosis which concern us and which occur in persons who are not frankly tuberculous, show the same predilection, and affect the ileo-cæcal segment of the gut in a large proportion of cases.

The reasons advanced in explanation of this affinity are diverse; Caird ascribes it in somewhat general terms to 'anatomical and physiological reasons'; and the antiperistaltic statis, the great absorptive activity, the accumulations of lymphoid tissue in the walls of these segments of the gut; and the chemical and bacteriological alteration in the contents may all be determining factors in this selection.

The age and sex incidence of Caird's (43) Conrath's (75 cases in which these particulars were given) and my own (14) cases are shown in the following table:-

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<th>AGE</th>
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<th>FEMALE</th>
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<tr>
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<td>11-20</td>
<td>5</td>
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<td>21-30</td>
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<td>74</td>
<td>132</td>
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We may, therefore, conclude that localised or primary intestinal tuberculosis is a disease of young adult life,
which shows a slight preference for the female sex.

Caird found a personal or family history of tuberculosis in 18 of his 43 cases, and this was noted in 5 of my 14 cases.

In Caird's series the site of the disease was approximately localised as follows:—

Jejunum only 1; ileum only 14; ileum and ileo-caecal valve 11; ileo-caecal valve 8; ileo-caecal valve and colon 5; transverse colon 2; abscess, involving small or both guts 2.

Of my cases the ileum alone was affected in 2; while the ileo-caecal region (including commencement of ascending colon) was the site of the disease in 11, and an isolated lesion in the ileum was associated with disease of the colon in one case.

There appears to be a general unanimity of opinion that the intestinal lesions in phthisical individuals are due to infection of the inner coats of the bowel with tubercle bacilli swallowed in the sputum; in other words the affection of the intestinal tract is secondary to the pulmonary disease, although in some cases, and particularly in children, the symptoms of intestinal involvement may assume outstanding importance in the clinical manifestations of disease.

The aetiology of the chronic and apparently primary forms of the disease offers a more difficult problem, for while some instances of isolated intestinal disease have been recorded, in which the absence of pulmonary disease has been verified at autopsy, the not infrequent development of pulmonary tuberculosis during the after history of many of these cases would suggest that some latent focus of disease had been all along
present in the lungs, and had escaped clinical
detection.

The infrequent but authenticated instances
of primary intestinal disease may, however, result from
ingestion of infected food, and the chronicity of the
lesion suggests that the bovine type of organism may
be the causal agent in some of these cases.

When we remember the comparative susceptibility
of certain portions of the intestinal tract to tubercle,
the relative infrequency of the disease would appear to
be more noteworthy than its occasional occurrence, as
tuberculous infection of milk and other food constituents
must frequently take place under the defective hygienic
conditions of life in a crowded city.

Another route by which the tubercle bacilli
may reach the intestine is by infection through the blood
stream from a primary pulmonary focus.

Though otherwise rare this method of spread does
take place in general miliary tuberculosis, and the
possibility of its occasional occurrence as an outstanding
feature would seem to be proved by the histological finding
of infection in the submucous lymph follicles in a case
published by CHRISTIDES (1914).

It has been suggested that those cases in which
the disease is chiefly limited to the subserous layer of
the bowel wall may be due to a blood borne infection;
this localisation of the disease was observed in Kidd's
three cases of pericolitis affecting the sigmoid flexure,
but in none of these cases was the tuberculous nature of
the disease proved, and as we shall see the occurrence of
pericolitis in this region may be explained on other
aetiological grounds.
It is again noteworthy that examples of these late manifestations of the tuberculous process may occur, in which no ulceration of the mucous surface can be demonstrated; it is, therefore, possible that the original breach of surface may have healed, for localised deformity and stricture from scarring of the outer coats of the bowel are not of uncommon occurrence in the ileum in association with an intact condition of the mucosa.

As it is proved on experimental grounds that tubercle bacilli can penetrate the intact mucosa, and subsequently infect the submucous coat or the regional lymph glands, the possibility of this occurrence must be admitted, but the intense round called infiltration and the extensive fibrosis which constitute the histological features in the chronic forms of the disease would appear to indicate a chronic infection with the bowel organisms through a breach of surface, as the main determining factor in these types of the disease.

Even in the ileo-caecal region, which is the commonest site for tuberculous disease, the paucity or absence of definite tuberculous manifestations in the affected tissues and glands is characteristic of the "hyperplastic" forms of disease, and it has been advanced as an explanation that this is due to attenuation of the tubercle bacilli by their association with the bowel organisms. This suggestion would appear to be contrary to recognised pathological teaching, which affirms that the action of the tubercle bacilli is favoured by such an association, and it would seem preferable to assume that while the tubercle may breach the mucosa, the fibrosis is the result of the local tissue reaction in a
resistant individual, which is determined by a simple chronic infection with the bowel organisms through this atrium, and is maintained by chronic lymphatic stasis in the bowel wall as a result of degenerative changes in the lymphatics and regional glands.

These inflammatory and fibrotic changes may occasionally predominate in the subserous coat of the bowel, and Conrath's suggestion that this special type is due to retrograde spread along the lymph channels from primarily diseased regional glands would appear to be unnecessary.

Shennan (1914) sums this matter up in the following words:

'when a recent tuberculous manifestation is found in the walls of the intestine, in association with older caseous tuberculosis of the mesenteric and retroperitoneal glands, one frequently concludes that the intestinal condition is secondary to the tuberculous mesenterica, retrograde infection having occurred. This conclusion is of questionable validity, the more plausible explanation being that the recent intestinal tuberculosis is really due to a new infection by organisms which have reached the bowel by deglutition at a later period of time than those which have passed through its walls without causing a local lesion, but have been caught in the glands, and have produced caseation in that situation'.
In a tuberculous patient the intestinal lesion is an incident in the progress of a general malady, and where it does occur as an isolated lesion in the ileo-caecum, the ulcerative process appears to spread rapidly either in depth or in extent.

When it spreads in depth, the invasion of the deeper coats of the bowel is a definitely tuberculous process; the peritoneal surfaces around the spreading focus become studded with tubercles, and the involvement of the regional glands, cold abscess formation, adhesions and ultimately fistula formation, are exactly such as may occur in the entero-peritoneal form of tuberculous peritonitis.

Again in individuals of low resistance, the ulcerative process, while remaining restricted to the mucous and submucous coats, may progress in extent to give rise to extensive and multiple lesions in the inner coats of the colon.

The tubercle appears to advance in the lymphoid tissue of the submucous coat, and on naked eye inspection of the inner coat of the opened bowel, deposits can be seen studded around the ulcerated areas, which show through the undermined but still intact mucosa and later coalesce and break down in turn to form fresh ulcers around which the ragged mucosa projects in finger-like bunches.

When, however, the intestinal lesion occurs in a patient, who is not the subject of active tuberculosis, the character, course, and ultimate results of the disease are entirely different.

The long duration of minor symptoms, 15 or 20 years, is striking in many of these cases, and suggests
that the initial lesion may remain quiescent for years till attention is drawn to it by the supervention of a secondary condition, or by some complication produced by the process of its healing.

The outstanding feature of this form is its chronicity, but its chronicity is fraught with danger, for its presence alone shows that the bearer of the lesion has a greater tendency to tubercle than his healthy neighbour, and should he develop tubercle elsewhere, his intestinal focus may light up and progress as his resistance diminishes.

An additional danger lies in the fact that this breach of surface must constantly serve as an atrium through which secondary infection with the bowel organisms may take place. This infection may be acute or chronic. When acute it gives rise to all the manifestations of an acute inflammatory lesion in this region of the abdomen.

Where such local signs and general symptoms compel surgical intervention, the appearance of the affected gut is striking and characteristic, the whole caecum is turgid, stiffened, and pale from infiltration of its walls with gelatinous oedema, while the vessels and regional glands are acutely engorged and swollen. The oedema may even spread to the retroperitoneal tissues.

The effects of long continued chronic infection are less dramatic but are commonly found in the later stages of the disease, as the chronic inflammation set up in the gut walls and the regional glands leads on to extensive fibrotic changes which obscure, and may even obliterate the characteristics of the original lesion.

The hyperplasia thus induced may be either localised or diffuse in its distribution, but as the primary lesion is usually entirely restricted to the
ileocecal in these resistant patients, we find, as we should expect, that the local hyperplasia produced by the fibrosis is most commonly situated there, and gives rise to the local signs of tumour formation in that region.

This tumour, as Hartmann pointed out, tends to cause shortening of the ileo-colic loop, from contraction in and around it, so that the ileo-cecal angle is straightened out, and pulled up to a higher level than it normally occupies in the abdominal cavity.

The mobility of the tumour may be striking, and in one of my cases where the hyperplastic mass lay in the postero-mesial aspect of the wall of the ascending colon, it lead to the condition being wrongly diagnosed as that of movable kidney with hydronephrosis.

In other examples of the disease the mass may become fixed by adhesions to the structures on the posterior abdominal peritone, or from fusion with epicolic and mesenteric glands on its mesial aspect.

The affected portion of the gut is congested and dusky in colour, its peritoneal covering is dull, roughened and stippled in appearance, and the whole diseased area feels thickened, inelastic, and leathery to the touch.

When a definite tumour is present, its size depends on the amount of new tissue which has been formed, and the extent of its organisation, so that all stages from a large tumour simulating a neoplasm to a contracted scar may be found. The fat deposited on its surface, and the enlarged glands incorporated with the sclero-adipose mass contribute to its size and render its outline irregular.

When the diseased portion of the gut is excised and laid open, ulceration of the mucosa may be evident,
and is most commonly situated around the ileo-caecal valvæ, or in the terminal portion of the ileum.

These ulcers may be tuberculous in character, with thickened livid edges, which tend to be undermined and to project in irregular tags around those of larger size; while the smaller ulcers frequently lie concealed in the folds of the mucosa.

In old standing lesions, particularly where stenosis has supervened, these special characters tend to disappear, probably as a result of the chronic irritation set up by faecal stasis proximal to the obstruction. In one of my specimens the characteristic tuberculous ulcers were only seen in the ascending colon on the distal side of the stenosis.

In small ulcers the base is covered with slough or partly organised blood clot, while in larger breaches of surface the floor is formed by the muscular coats of the bowel.

The association of polypoid formations which stud the mucosa and project into the lumen has been noted in many of the recorded cases.

The appearance of the diseased tissues on section varies within wide limits, but the central portions usually appear, and cut like dense adult fibrous tissue, while the outlying parts of the adventitious tissues show softened areas, and contain islets of fat. The epicolic glands are frequently embodied in the mass, and may be calcified or caseous, while in other specimens they show a fleshy enlargement and resemble that form of glandular tubercle, which simulates the naked eye appearances of the affected glands in Hodgkin's disease.

While, for reasons suggested above, this localised hyperplasia is the type which predominates in the ileo-caecal region, even in this segment of the gut, the
Disease may show a tendency to set up a diffuse form of inflammatory thickening, which is more often found in other portions of the intestinal tract.

**DIFFUSE HYPERPLASTIC ENTERITIS**

From time to time, isolated examples or short series of cases have been reported in which the ileum, ileo-pelvic colon, transverse colon, and rectum have been found at operation or at autopsy to manifest a marked diffuse and uniform thickening of their walls.

The length of the segment of the bowel thus affected varies greatly. In Lartigau’s case two-thirds of the ileum, and the whole of the large bowel as far as the sigmoid flexure were involved; Kidd’s three cases were examples of the more common distribution, in which the walls of the ileo-pelvic colon alone exhibited the change, while in my two cases of diffuse hyperplasia, the condition was restricted to the ileum, and affected segments of fifteen and twelve inches respectively.

This interesting form of disease is generally assumed to be of a tuberculous nature, and it would appear that this assumption has been made in many of the recorded cases on somewhat insufficient grounds, and mainly because of the similarity of its macroscopic and histological characters with the hyperplastic forms of ileo-cecal tubercle.

While a tuberculous ulcer may undoubtedly serve as an atrium for chronic secondary infection of the walls of the gut, which may ultimately produce this type of diffuse thickening, a similar condition might equally result from many other chronic affections of the bowel; it is for example accepted that a diffuse hyperplastic change in the sigmoid flexure, may be a late result of chronic inflammation set up around multiple diverticula.

The conclusion that this form of diffuse fibrosis
is merely an end result of simple chronic inflammation, would leave the question of the nature of the initial lesion open, and is as far as we can safely venture to go, in the absence of definite histological or inoculation results in proof of its pathological nature.

I would, however, suggest that a further factor of some importance in the production of both the localised and diffuse hyperplastic forms of the disease may lie in chronic lymphatic obstruction, for the occurrence of well-marked fibrosis in the walls of the gut appears to be invariably associated with advanced tuberculous or degenerative changes in the regional glands, and Coquet\textsuperscript{7} records a case in which retrograde involvement of the iliac and inguinal glands gradually developed in association with hyperplastic ileo-caecal tubercle.

In exceptional cases I think it must be admitted that tuberculous disease in the ileo-caecal region may commence and in its early stages be restricted to the appendix itself. Fenwick and Dodwell\textsuperscript{39} found that tubercle appeared to be restricted to the appendix in 19 out of their 500 autopsies, but qualify the value of their statement by adding that no detailed examination appeared to have been made of the appendix in many of their post mortems, and Mayo Robson's statement to the effect that he found isolated disease of the appendix on five occasions must be accepted.

As but few appendices are submitted to histological examination after removal, it is possible that occasional examples of this restricted distribution are wrongly assumed to be of simple inflammatory nature.

It is, however, noteworthy that no example of primary tubercle in the appendix appears in Caird's series of 43 cases, and none occur in my series.

It is possible that the tendency of earlier writers to ascribe an active rôle to the appendix affected their
interpretation of the condition revealed by operation or at autopsy, and is reflected in their figures, as the number of examples of this localisation tends to diminish in more recent series of cases.

Secondary involvement of the appendix is, however, of frequent occurrence, and is an inevitable result of its anatomical proximity to the common site of the disease, and while in some cases, this appears to consist in a passive incorporation in the neighbourhood mass, in other cases the tuberculous process definitely invades the walls of the caecal appendage.

Mention has already been made of the fact that attention may only be drawn to the intestinal lesion as a result of its complications. Of these the commonest and most important is INTESTINAL OBSTRUCTION.

The narrowing of the lumen of the gut may result from gradual cicatrisation of an ulcer; the stricture then assumes an annular character, and as the commonest site for the ulceration is the ileo-caecal valve, this is the region most frequently involved.

A second form of stricture is found in association with both forms of fibrosis; the position and length of the stenosis then depend on the site and extent of the area involved in the hyperplastic process.

In the localised ileo-caecal variety the lumen is distorted by unilateral bulk of the mass, or by concentric thickening in the walls of the gut, while polypoid adenomatous projections may occur on the mucosa and help to occlude the intestinal lumen.

Narrowing of the lumen of the bowel in association with the diffuse form of hyperplasia appears to be more inconstant in its occurrence; where the mucous or submucous
coats are the site of maximum infiltration, their concentric thickening gradually leads to a reduction in calibre in the length involved; while in those varieties of the diffuse fibrosis in which the new tissue is laid down in the subserous layer, thickening of the gut wall may occur without constriction of the passage.

As all these forms of stenosis are gradual in onset, and progress slowly, the gut on the proximal side of the obstruction undergoes adaptive hypertrophy, which may reach such extraordinary degrees as to cause it to be described as phenomenal (Cotterill).

This thick walled muscular gut forms a marked contrast with the thin and collapsed bowel distal to the stricture.

The absence of such hypertrophy in a stricture of this nature calls for a particularly careful inspection of the gut in a proximal direction as it may be associated with the presence of strictures at a higher level.

Multiplicity of strictures is by no means uncommon, particularly in the ileum, where such puckered areas of retraction probably result from the healing of former ulcers; large pouch-like dilatations may then form between the strictures, which at operation have been found to lodge large faecal concretions, a gall stone (Mayo Robson) or fruit stones and seeds.
The microscopic appearances of the affected tissues and glands are generally frankly tuberculous in the acute and progressive varieties of the disease, which appear to start in the solitary glands which beset the reticular interglandular tissue of the mucous membrane.

The tuberculous granulations which replace the lymphoid follicles gradually coalesce, degenerate, and finally burst into the lumen; Fresh tubercles arise in the submucous tissue, and the process spreads in extent so that the mucosa may be extensively undermined, and confluent ulcers may be formed by the fusion of neighbouring foci.

The muscular layers of the gut appear to offer considerable resistance to the spread in depth of the disease, and the mucosa and submucosa may be widely destroyed with the muscle exposed in the bases of the gaps, while the outer coats merely show chronic inflammatory thickening.

Where, however, the disease spreads in depth, it appears to follow the lymph channels through the muscular tunics, and to extend freely in the subserous layer.

The lymph glands are early involved and become transformed into large tuberculous masses. Giant cells may be seen in the layer of small round cells under the capsule.

The histological characters of the chronic varieties of ileo-caecal tuberculosis are subject to considerable variations which depend on several factors, the most important of which appear to be (1) the age of the lesion; (2) its localisation - in some cases the submucous, in others the subserous lymph plexus is chiefly affected; and (3) on the extent to which the characters of the original disease have become obscured by secondary inflammatory changes.
The mucosa is greatly thickened, vascular, and studded with enlarged villi, which gives it a granular or polypoid appearance. Its tubular glands are elongated, tortuous, and in places show cystic dilatations; these changes appear to be secondary to inflammatory oedema and round celled infiltration in and around the villous projections.

Apart from the areas of ulceration the epithelium is intact, and shows the usual characters, i.e. tall cylindrical epithelial cells, and numerous goblet cells.

The hypertrophy of the villi is particularly marked around the margins of the ulcerated areas where in places they appear to be fused to form polypoid projections, which show the structure of mucous membrane polypi with oedematous connective tissue cores covered by elongated epithelial cells.

The stroma of the mucosa shows a general round celled infiltration with aggregations of epithelioid cells and small round cells in its lymphoid follicles; giant cells of the Langhan's type may occasionally occur.

The chief pathological changes are to be found in the submucosa which contains numerous aggregations of small round cells, amongst which a few large epithelioid cells with lightly staining vesicular nuclei and giant cells may sometimes be observed.

This granulation tissue proliferates diffusely under the mucosa, and here and there the cellular masses appear to have destroyed the muscularis mucosae and bulge the mucous coat into the lumen.

The presence of tubercle bacilli, and of other organisms has occasionally been demonstrated.

The floor of the ulcers is formed by granulation tissue of similar characters, but the superficial layers
are necrotic.

The muscular coats are thickened, and their fibres separated up into discrete bundles by strands of embryonal cells which pass up from the submucosa along the lymph channels.

In specimens in which hyperplasia is a marked feature, tuberculous cellular characteristics may be entirely absent, and the main histological features consist in small round celled infiltration of the mucous, submucous, or subserous coats.

In circumscribed hyperplasia the mucosa may either be polypoid or smooth, and in places its epithelium may have completely disappeared over the underlying granulation tissue.

The bulk of the tumour is, however, formed by massive round celled aggregations which occupy the subserous layer.

The muscle coats of the bowel become broken up, and may disappear completely in the affected area.

In the edges of the hyperplastic mass and in old standing cicatrised areas the cells are spindle shaped, connective tissue fibres occur between them, and the blood vessels are scanty, while prolongations of the connective tissue pass like trabeculae into the masses of round cells, and collections of fat cells are embedded under the thickened peritoneum.

A detailed account of the histological changes in the specimen of diffuse hyperplasia will be found under Case XIII.

The pathological changes chiefly occurred in the mucous coat of which the glandular layer was ulcerated in places, and almost entirely replaced by an infiltration of small round cells, while its deeper layers showed cellular proliferation, and all the coats were enormously
thickened from vascular congestion and lymphatic stasis. No definite tuberculous lesion could be demonstrated either by Dr. Gruner, who first examined the specimen, or by Professor Stewart who re-examined it, and it is of interest to note that in other three cases of this series (Cases VII - IX) all of which were examples of ulceration combined with marked local hyperplastic changes, there was a similar negative finding on careful histological examination, while a positive result was obtained on guinea pig inoculation. It is, therefore, unfortunate that this method of examination was not adopted in the specimen of diffuse hyperplasia, as it is clearly shown by our results that if this further examination is omitted, there is always the underlying possibility that these hyper-plastic lesions may at bottom be tuberculous.

The involvement of the regional glands is frequently striking in the chronic forms of the disease, and while they may show gross degenerative changes, such as caseation or calcification, they apparently more frequently exhibit a uniform fleshy enlargement from lymphoid and fibrous hyperplasia.
VI. CLINICAL FEATURES AND DIAGNOSIS

In a phthisical patient, persistent intestinal symptoms, such as colic and diarrhoea with the passage of blood and mucus, may fairly be ascribed to the presence of an active ulcerative tuberculous intestinal lesion; and when local signs of an ill defined tender swelling in the right iliac region are added to these symptoms, we probably have to do with that variety of ileo-caecal lesion in which the ulcerative process, after spreading in depth to the deeper coats of the bowel, has commenced to involve the neighbouring structures.

Under these conditions, surgical interference is only likely to be called for in exceptional cases as, for example, where the acute character of the local peritoneal reaction points to threatened perforation, or when a good general condition is associated with well marked and progressive signs of localised disease.

In patients who are not obviously tuberculous, the clinical characters and complications of the disease differ completely from the above.

The chronic character of the disease often only becomes apparent when careful questioning of the patient with regard to his past history shows that he has suffered for years from minor symptoms of gastric and intestinal discomfort, such as nausea, colicky pain and diarrhoea, and it is usually only the progressive character of the trouble, or the onset of some complication which causes him to seek advice.

By far the commonest complication is CHRONIC OBSTRUCTION, and the symptoms of this condition gradually become superposed on those of the original lesion. The attacks of griping colicky pain increase in frequency,
severity and duration. The nausea is now accompanied by occasional vomiting. Constipation, or constipation alternating with diarrhoea may appear. Flatulence becomes troublesome, and splashing noises may be felt, and not infrequently heard.

The actual nature of the disease is still but rarely suspected, and as the pains frequently have a definite relation to food, medical treatment for some form of indigestion is tried, till finally LOCAL INTESTINAL SPASM makes its appearance during the attack, or is excited during examination of the abdomen.

The distension and rigid spasm affect the small intestine and are most marked in the right lower abdomen.

A correct diagnosis is now possible, and is suggested by the long progressive history in a comparatively young individual, of possibly tuberculous antecedents, of intestinal symptoms, which have gradually become associated with signs of obstruction of this character.

The nature of the disease may again be suspected when these attacks of abdominal pain are associated with the presence of a TUMOUR in the right iliac region.

A tumour may appear under the following conditions:—

(1) A tumour forms rapidly, and is accompanied by local tenderness and febrile symptoms, when an acute typhlitis is set up by infection through the local lesion. The differentiation of this complication from appendicitis with a marked local peritoneal reaction is almost impossible; still one or two unusual features may be noticed before operation. The tumour is well defined, rather hard, and sausage shaped, and its presence is noted at a comparatively early stage of the illness.
Where the local reaction around the ileo-caecal lesion is of a chronic character, and is not associated with definite tumour formation or signs of obstruction, still greater difficulty is experienced in differentiating it from chronic appendicitis. The slight distension of the intestine obscures the local signs before obvious intestinal spasm makes its appearance, and the attacks of colic with tenderness on deep palpation of the right iliac fossa are almost certainly mistaken for recurring attacks of appendicitis.

(2) A tumour forms slowly in the ileo-caecal region and (a) is not associated with symptoms of obstruction. When this tumour is not associated with intestinal symptoms it may simulate a renal swelling, because it may lie on a level with the lower pole of the kidney, and its mobility may be marked. This mistake in diagnosis was made in one of my cases, and I have known it to occur in the practice of another surgeon; while Czerny, Gilford and Hatch appear to have made similar errors in the cases which they recorded.

As a general rule the differentiation should be fairly easy because (1) the mobility of a caecal tumour is chiefly in a lateral direction, and its position is not markedly affected by the respiratory movements. (2) Bimanual palpation shows that the caecal tumour does not extend back into the loin and (3) renal symptoms should be absent and intestinal troubles may be present.

(b) A tumour forms slowly and is associated with symptoms of intestinal obstruction.

The distinction from a malignant tumour of the caecum may be impossible; as this difficulty is experienced even on handling and on naked eye inspection of the gut affected by the hyperplastic form of the disease, the clinical determination of the nature of the swelling may well offer
insuperable difficulties; still, the comparative youth of the patient; tuberculous antecedents; the long history, and the length of time the tumour has been present, would all tend to influence us in favour of a diagnosis of ileo-caecal tubercle.
VII. TREATMENT AND RESULTS

Some form of surgical intervention is necessary for the successful treatment of primary or localised intestinal tuberculosis, and the ideal method undoubtedly is a complete one stage excision of the diseased segment of gut with its regional glands. This is, however, a serious operation, which may be counterindicated by the poor general condition of the patient or by unusual local difficulties.

In a feeble patient; in the presence of acute obstruction, or where there is widespread fixation of the mass, it is probably better to err on the side of safety and to establish a lateral anastomosis between the ileum and transverse colon.

In the chronic and hyperplastic forms of the disease, while this alone may suffice to relieve the patient, the after history in all but the most chronic examples of the lesion proves, that permanent relief from this simple short circuiting operation is an exceptional occurrence.

RUBESCH'S figures\textsuperscript{10} would appear to be conclusive evidence on this point. Of his 12 cases in which a short circuit was made and the diseased gut left, he found that only one patient could be considered to be permanently cured by this procedure, and this patient suffered from an exceptionally chronic form of the disease (10 years history - simple fibrosis of the gut). His other cases all died within three and a half years, more than half from local (peritonitis, intraperitoneal abscess and fistula formation) the rest from pulmonary complications.

Of the 3 cases in my series in which the patient was left with a short circuit, one (Case X; 15 years history - circumscribed ileo-caecal hyperplasia) refused resection, and the anastomosis appeared to have relieved him, as he was
working regularly as a file cutter when re-examined 5 years after operation, but the local resistance and tenderness then found were evidence of the persistence of the local lesion. The second case (XIV-diffuse fibrosis) similar local manifestations were present, while the third case (Case VI) does not appear to be relieved.

RUBESCH on these grounds strongly recommends that excision should be performed wherever this is possible, as a one stage, or failing that, at a subsequent operation, while Caird advocates a similar line of treatment in the following words:— 'the treatment of hyperplastic stricture practically follows the principles common to that of malignant disease of the intestine. It aims at a free and complete resection of the affected area, including generally the ileo-caecal region. There is not, however, the same necessity as in carcinoma for removal of all enlarged glands, and much should not be risked in this respect.

Short circuiting should be reserved to overcome obstruction when excision is impracticable and may pave the way for subsequent resection. The mortality after lateral anastomosis is not so great as that from excision, but it should not replace the latter unless the condition of the patient precludes it'.

While the technique of the operation will vary with the experience and individual preference of the operator, attention might be drawn to the following points:—

A paramedian incision should be adopted.

A large incision is an aid to the successful performance of the extensive resection, and free access can only be obtained, without damage to the nerve supply of the abdominal muscles, by a paramedian incision with outward displacement of the muscle.
The extent and mobility of the lesion is determined by careful examination of the affected gut and its regional glands.

Where the disease occurs in its usual site, around the ileo-caecal valve, particular attention should be paid to the condition of the lower ileum, which should be carefully examined for indications of disease proximal to the more obvious ileo-caecal lesion.

It is unfortunate that the presence of ulceration in the lower ileum is frequently obscured by hypertrophy of the muscular walls of this segment of the gut, as local recurrence may result from an incomplete removal of the disease.

In all cases it is safer to include the lower eighteen inches of the ileum in the resection, even when it appears to be healthy.

The next step consists in the mobilisation of the whole condemned loop of gut, by incising the peritoneum on the outer side of the caecum, ascending colon and hepatic flexure.

As the freed gut is stripped towards the median side by the fingers, and gauze dissection, great care must be taken not to damage the duodenum which lies in close relation to the hepatic flexure, and the ureter and spermatic or ovarian vessels, which must be gently stripped and pressed back on to the posterior abdominal wall as the separation proceeds.

The bare area on the posterior abdominal wall is thoroughly packed off.

Long Kocher's or crushing forceps are applied to the gut to mark the limits of the resection.

Artery forceps are applied in pairs to the colic vessels which are easily seen on the deep aspect of the mobilised mesentery, and the loop of gut, with a wedge
Fig. 14. An iso-peristaltic anastomosis is preferable, as the intestinal contents are thrown into the colon in a direction away from the weak colic stump.
shaped segment of mesentery, and its enlarged regional glands is gradually freed as the vessels are divided between the forceps and tied off.

The freed loop can now be drawn well out of the abdominal wound and the loops of small intestine are packed off.

The ileum and transverse colon are divided between forceps at the selected points, and the resected gut is removed.

The cut ends of the ileum and transverse colon are invaginated, and then an iso-peristaltic lateral anastomosis is established between the lower portion of the ileum and the transverse colon.

The danger in the operation appears to lie in leakage from the invaginated cut end of the transverse colon. The muscular coat of this portion of gut is obscured by the attachment to it of the layers of the omentum, and it is always difficult to sink it satisfactorily. With an iso-peristaltic anastomosis (Fig.14) this danger is to some extent obviated as the contents of the small intestine are then thrown into the transverse colon in a direction away from this weak suture line, and there does not appear to be the same danger of leakage from it.

The suture lines are swabbed over with ether, and the omentum is tacked down over the invaginated ends, and the line of anastomosis.

Gloves, towels, and soiled instruments are changed; the packs are then removed and the ligated vessels inspected. A rubber drainage tube is put down into the right kidney pouch, either through a stab wound in the loin, or through the original incision, and the wound stitched up.

Morphia usually has to be given for shock and restlessness after operation, but it is always given with
reluctance, as it tends to obscure post
operative symptoms, and may lead to paralytic
distension of the bowels.

Large hot fomentations are applied to the
whole abdomen to relieve pain.

The diet is absolutely restricted to fluids
for at least a week during which small saline and glucose
enemata are given at frequent intervals.

If the local condition is satisfactory the drainage
tube is shortened on the second and removed on the third day.

No aperients are given; the bowels usually act
without interference on the fourth or fifth day.

In conclusion the following may be summarised
as the more important points in operative technique:

(1) A large paramedian incision should be used, and
its edges carefully protected by tetra cloths.

(2) The gut is mobilised but not resected, till all
its vessels are ligated, and the stripped posterior
abdominal wall and intestines have been carefully
packed off and protected.

(3) An iso-peristaltic anastomosis is established after
the cut ends of the ileum and transverse colon have
been satisfactorily invaginated.

(4) Swab any soiled surfaces with ether.

(5) Leave in a drainage tube for two or three days.

(6) Discomfort may be relieved by large hot fomentations
more safely than by the administration of morphia.

(7) Keep the patient to fluids by the mouth and rectum
for the first week.

(8) Don't give aperients. In the absence of peritoneal
infection the bowels will act naturally.

The results of operation in my series of cases
are as follows:-
Intestinal Anastomosis (lateral) was performed either as the first stage or as the only operation in 7 cases with 0 deaths.

In one of these cases the anastomosis was combined with resection of a localized tuberculous stricture of the ileum.

RESECTION (of the lower ileum and right half of colon) was performed in 10 cases with 3 deaths; i.e. a 30 per cent mortality.

Of 7 who survived, 1 died two years after from diffuse tuberculous peritonitis following recurrence in the ileum. 5 have been recently re-examined and are in good health and doing their ordinary work; while one was in good health and resumed work three months after operation, but cannot now be traced (Case II).

CAIRD’S RESULTS are as follows:—,

'Cases 13 died in hospital
13 died at home
14 alive recently
3 not traced.

OPERATIVE RESULTS:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Recovered</th>
<th>Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resection 1st operation</td>
<td>27</td>
<td>12</td>
</tr>
<tr>
<td>Resection 2nd operation</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Short circuiting 1st operation</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Short circuiting 2nd operation</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Altogether there were 48 operations on 43 patients with 13 deaths; while tubercle was the probable cause of death in many of the 13 cases that have perished since leaving hospital, but exact information could not always be obtained'.

RUBESCHI gives the following operative results:—
In his own series of cases, resection was performed in 10 with 1 death (10 per cent mortality).

BRUNNER had a 25 per cent immediate mortality in his resection cases.

MIKULICZ - 16 resections, 3 immediate deaths (18.75 per cent).
CZECHY - 16 cases, 5 deaths
(31.25 per cent)

FUCHSIG Vienna Clinic 7 resections,
2 deaths (28.57 per cent)

WIETING 6 resections, 3 deaths (50 per cent)

DURANTE - 5 cases, 0 deaths.

While according to CAMPIONE the immediate mortality of resection in 154 cases was 20.12 per cent.
Tuberculous intestinal lesions are commonly found in phthisical individuals, and this secondary type of the disease tends to assume one of two forms - (1) the entero-peritoneal (2) the ulcerative.

The entero-peritoneal form results when the disease spreads in depth to invade the outer coats of the gut, and the neighbouring structures; while in the ulcerative type, which is more commonly found in the large intestine, the disease remains restricted to the mucous and submucous coats, which are rapidly but irregularly destroyed over large areas.

The Localised Form of Intestinal Tuberculosis occurs in individuals infected with, but resistant to tubercle, and the lesion is commonly situated in the neighbourhood of the ileo-caecal valve.

The disease runs a chronic course, and attention may only be drawn to it as it cicatrizes and narrows the gut, or serves as a starting point for acute or chronic infections of its walls.

The chronic secondary infection gives rise to the formation of localised, or more rarely diffuse, granulomatous masses which thicken the walls of the gut, and may obstruct its lumen.

While tubercle is the common cause of the localised form of hyperplasia, it would appear that the diffuse variety of thickening of the walls of the gut may result from any condition which can set up and maintain a chronic infection of the walls of the bowel, and the histological appearances of the diseased tissues and regional glands suggest that lymphatic obstruction and resulting chronic lymphatic oedema are factors of importance in the production of both.

VIII SUMMARY

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